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PG&E Letter DCL-07-097
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
License Amendment Request 07-04
Proposed Technical Specifications Change to Relocate Surveillance Test Intervals to a Licensee-Controlled Program (Risk Informed Technical Specifications Initiative 5b)

References:
1. Technical Specification Task Force (TSTF) Traveler number TSTF-425, Revision 1, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5," dated April 2007.
2. NEI 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," dated April 2007.

Dear Commissioners and Staff:

In accordance with 10 CFR 50.90, enclosed is an application for amendment to Facility Operating License Nos. DPR-80 and DPR-82 for Units 1 and 2 of the Diablo Canyon Power Plant (DCPP) respectively.

Pacific Gas and Electric Company (PG&E) proposes to relocate all periodic surveillance frequencies from the technical specifications (TS) and place the frequencies under licensee control in accordance with a new program, the Surveillance Frequency Control Program.

The enclosed license amendment request (LAR) is being submitted as a pilot submittal in support of Risk Informed TS Initiative 5b, "Relocate Surveillance Test Intervals to Licensee Control." On September 28, 2006, the NRC approved the lead plant submittal for Initiative 5b for Limerick Generating Station. On that same date, the NRC provided the final Safety Evaluation for the methodology document, NEI 04-10, Revision 0.

A001
NRR

The NRC's approval of NEI 04-10 stated that it was only applicable to boiling water reactors and that it did not approve relocation of requirements to perform surveillances on a staggered test basis. Revision 1 of TSTF-425 (Reference 1) and NEI 04-10 (Reference 2) address the above two restrictions and support the changes proposed in this LAR. This LAR uses the methodology in Reference 2, and requests similar changes to those proposed in Reference 1, currently under review by the NRC.

By letter dated October 2, 2007, "Request for Additional Information (RAI) Regarding TSTF Traveler 425, Revision 1, 'Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5,' PROJ 0753, (TAC No. MD5711)," the NRC requested additional information from the TSTF regarding Reference 1. This LAR does not address these RAIs, some of which are unlikely to apply to this application or may be resolved generically through the TSTF.

This LAR proposes a change to several TS pages that are expected to be revised prior to approval of this LAR (due to other in-process LARs). Because of this, retyped TS pages are not included in this submittal. PG&E will provide fresh marked up and retyped TS pages prior to approval of this LAR.

Enclosure 1 contains a description of the proposed changes, the supporting technical analyses, and the no significant hazards consideration determination. Enclosure 2 contains marked-up TS pages. Enclosure 3 contains marked-up TS Bases pages. TS Bases changes are provided for information only and will be implemented pursuant to TS 5.5.14, "Technical Specifications Bases Control Program," at the time this amendment is implemented.

Individual surveillance test intervals (STIs) will not be revised as part of this LAR; however, a summary of the results of example STI evaluations using the risk informed methodology as detailed in Reference 2 are provided in Enclosure 4. Once this LAR and the revised risk-informed process and methodology are approved by the NRC, future changes to the STIs will be evaluated in accordance with the licensee-controlled program. Enclosure 5 discusses the technical adequacy and scope of DCPP's probabilistic risk assessment (PRA) Model.

PG&E has determined that this LAR does not involve a significant hazard consideration as determined per 10 CFR 50.92(c). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of this amendment.

The changes in this LAR are not required to address an immediate safety concern. PG&E requests approval of this LAR no later than October 2008. PG&E requests the license amendment(s) be made effective upon NRC issuance, to be implemented within 180 days from the date of issuance. An implementation period of 180 days would provide a reasonable amount of time for implementation of TS and TS bases changes, training, and new procedures necessary to implement the surveillance frequency control program.

This communication contains new commitments to be implemented in support of this LAR. The commitments are contained in Enclosure 6.

If you have any questions or require additional information, please contact Stan Ketelsen at 805-545-4720.

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

Executed on October 15, 2007.

Sincerely,

James R. Becker
Vice President - Diablo Canyon Operations and Station Director

mjrm/4557 A0694315

enclosures

cc:	Gary W. Butner, DPH Elmo E. Collins, NRC Region IV Michael S. Peck, DCPP NRC Senior Resident Inspector Diablo Distribution
cc/enc:	Alan B. Wang, NRC Project Manager

EVALUATION

1.0 SUMMARY DESCRIPTION

This letter is a request to amend the Facility Operating Licenses DPR-80 and DPR-82 for Units 1 and 2 of the Diablo Canyon Power Plant (DCPP), respectively.

The proposed amendment would implement changes consistent with Technical Specification Task Force (TSTF) Traveler number TSTF-425, Revision 1, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5," dated April 2007, which relocates the surveillance frequencies, also known as surveillance test intervals (STIs), of various Technical Specification (TS) surveillance requirements (SRs) from the TSs to a licensee-controlled document. TSTF-425 is currently under review by the NRC.

The relocated STIs would be controlled in accordance with the requirements stipulated in a new program, the Surveillance Frequency Control Program (SFCP), which is being added to the Administrative Controls Section of the TSs. Enclosure 2 provides the marked up TS pages. Enclosure 3 provides the marked-up TS Bases pages for information only. Enclosure 4 provides sample STI evaluation forms. Enclosure 5 discusses the technical adequacy and scope of DCPP's probabilistic risk assessment (PRA) Model.

NEI has developed a risk-informed methodology, documented in NEI 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," dated April 2007, which provides a method to evaluate and revise STIs, where appropriate, within the SFCP. This methodology document will be referenced in the SFCP and will be incorporated by reference into the Administrative Controls Section of the TSs.

Individual STIs will not be revised as part of this license amendment request (LAR). However, once this LAR is approved by the NRC, future changes to the STIs will be evaluated in accordance with the licensee-controlled program, and the STIs may be revised, as appropriate, based on the evaluation results without prior NRC approval. Examples of STI evaluations using the risk-informed process and methodology of NEI 04-10, Revision 1, are provided in Enclosure 4.

Various TS surveillance requirements, including, in some cases, their associated STIs, were established based on commitments to Regulatory Guides, or based on implementation of NRC-approved Licensing Topical Reports. The SRs themselves will not be relocated to the SFCP and will continue to be performed in accordance with the applicable Regulatory Guide or Topical Report, as appropriate; however, the associated STIs relocated to the SFCP may be modified in accordance with the SFCP. Where the associated STIs were established based on commitments documented in the plant's safety analysis, those commitments would be subject to review by an independent decision-making panel (IDP) using the guidance of NEI 99-04, "Commitment Control," and could potentially be changed by the licensee-controlled program without prior NRC approval.

2.0 DETAILED DESCRIPTION

This proposed change will result in the following:

1. Revised Index, as appropriate, to reflect the TS changes proposed below.

2. Replace various STIs specified within individual SRs with a reference to the licensee-controlled program, e.g., with the words, "In accordance with the Surveillance Frequency Control Program." The proposed change applies primarily to surveillances that are performed on a fixed periodicity. Existing STIs that are not proposed to be relocated as part of this request are associated with SRs that:

   a. Have no time component but are purely event driven, e.g., "prior to thermal power exceeding 75% RTP"; or

   b. Are event-driven but have a time component for performing the surveillance on a one time basis once the event occurs, e.g., "within 24 hours after thermal power reaching $\geq$ 95% RTP;" or

   c. Reference an already established and approved licensee program rather than a specific interval, e.g., SRs that refer to the Inservice Testing Program.

3. Add a new TS Section 5.5.18, "Surveillance Frequency Control Program," which will describe the basic means for licensee control of surveillance frequencies within the licensee-controlled program and includes the following requirements:

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

   b. Changes to the Frequencies listed in the SFCP shall be made in accordance with NEI-04-10, and

   c. The provisions of SR 3.0.2 and 3.0.3 are applicable to the Frequencies established in the SFCP.

4. Revise the TS Bases, as appropriate, relative to the proposed TS changes described above. The TS Bases changes are included for information only.

5. Remove a note from TS 3.3.5.2, SR 3.3.5.2 under Frequency that is no longer applicable.

3.0 TECHNICAL EVALUATION

The changes requested by this amendment are programmatically the same as those granted by the NRC for the Limerick Generating Station on September 28, 2006. These changes allowed the relocation of surveillance frequencies, also known as STIs, of various TS SRs from the TSs to a licensee-controlled document, which would be controlled in accordance with the requirements stipulated in a new program, the SFCP in the Administrative Controls Section of the TSs. Since the relocation of the STIs from the TS to a licensee-controlled program does not affect the plant design, hardware, or system operation and will not affect the ability of the plant to perform its design function in mitigating the consequences of a postulated design basis accident, the proposed TS changes are administrative in nature. The new program, SFCP, will control any changes to the relocated STIs and ensure the SRs specified in TS are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. The program contains the following requirements:

- The SFCP shall contain a list of Frequencies of those SRs for which the Frequency is controlled by the program.
- Changes to the Frequencies listed in the SFCP shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.
- The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the SFCP.

NEI 04-10 provides the detailed process requirements for controlling surveillance frequencies of the TS SRs that have been relocated from the TSs to the SFCP. The methodology described in NEI 04-10 provides a risk-informed process to support a plant expert panel assessment of proposed changes to surveillance frequencies, assuring appropriate consideration of risk insights and other deterministic factors, which may impact surveillance frequencies, along with appropriate performance monitoring of changes and documentation requirements.

The NRC issued a Final Safety Evaluation for NEI 04-10 Revision 0, "Risk-Informed Method for Control of Surveillance Frequencies," on September 28, 2006. The Staff found that NEI 04-10, Revision 0, was acceptable for referencing by licensees proposing to amend their TSs to establish an SFCP, provided that the following conditions are satisfied:

1. The licensee submits documentation with regard to PRA technical adequacy consistent with the requirements of RG 1.200, Section 4.2.

2. When a licensee proposes to use PRA models for which NRC-endorsed standards do not exist, the licensee submits documentation, which identifies the quality characteristics of those models, consistent with RG 1.200, Sections 1.2 and 1.3. Otherwise, the licensee identifies and justifies the methods to be applied for assessing the risk contribution for those sources of risk not addressed by PRA models.

PG&E has performed sample STI evaluations to verify the NEI 04-10 process can be properly implemented. A discussion of the process and the STI evaluation forms are provided in Enclosure 4.

A discussion of the PRA quality and scope is provided in Enclosure 5.

4.0 REGULATORY ANALYSIS

4.1 Applicable Regulatory Requirements/Criteria

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

The proposed change relocates the intervals for the performance of various SRs from TS to a licensee-controlled program using an NRC approved methodology for control of the surveillance intervals once in the licensee program. The SRs themselves will remain in TS. The In-Service Test Program (IST Program) for ASME components governed by TS 5.5.8 established a precedent for relocation of STIs to a licensee-controlled program. In several instances, the DCPP TS do not specify a particular surveillance interval but rather state: "In accordance with the Inservice Testing Program."

TS Section 5.5.8 references the ASME Operations and Maintenance (OM) Code for inservice testing intervals. The testing intervals are based on the plant's IST Program which implements the ASME OM Code. Within the

IST program, the actual testing intervals vary based on the performance of the individual components.

The proposed TS changes are administrative in nature. Relocation of the STIs from the TS to a licensee-controlled program does not affect the plant design, hardware, or system operation and will not affect the ability of the plant to perform its design function in mitigating the consequences of a postulated design basis accident. The program for changing the intervals establishes criteria and requirements for surveillance test frequencies adequate to demonstrate operability of the TS components. Therefore, the proposed change does not adversely affect nuclear safety or plant operations.

4.2 Precedent

On September 28, 2006, a similar change, Limerick Generation Station, - Relocate Surveillance Test Intervals to Licensee-Controlled Program (TAC NOs. MC3567 AND MC3568) was approved. The program proposed by PG&E is administratively and technically identical to the program approved for Limerick with the following exceptions:

1. The DCPP submittal is based on Revision 1 of TSTF-425
2. The DCPP submittal references Revision 1 of NEI 04-10.
3. Limerick and DCPP are different reactor types, which is not relevant to the requested change.

4.3 Significant Hazards Consideration

PG&E has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change involves the relocation of various surveillance test intervals from TSs to a licensee-controlled program and is administrative in nature. The proposed change does not involve the modification of any plant equipment or affect basic plant operation. The proposed change will have no impact on any safety related structures, systems or components. Surveillance test intervals are not assumed to be an initiator of any analyzed event, nor are they assumed in the mitigation of consequences of accidents. The SRs themselves will be maintained in the TS along with the applicable Limiting Conditions for Operation (LCOs) and Action statements. The surveillances performed at the intervals specified in the licensee-controlled program will assure that the affected system or component function is maintained, that the facility operation is within the Safety Limits, and that the LCOs are met.

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.

The proposed change does not involve any physical alteration of plant equipment and does not change the method by which any safety-related structure, system, or component performs its function or is tested. As such, no new or different types of equipment will be installed, and the basic operation of installed equipment is unchanged. The methods governing plant operation and testing remain consistent with current safety analysis assumptions.

Therefore, the proposed change will 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 a margin of safety?

Response: No.

The proposed change is administrative in nature, does not negate any existing requirement, and does not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. As such, there are no changes being made to safety analysis assumptions, safety limits or safety system settings that would adversely affect plant safety as a result of the proposed change. Margins of safety are unaffected by relocation of the surveillance test intervals to a licensee-controlled program.

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

Based on the above, PG&E concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

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.

5.0 ENVIRONMENTAL CONSIDERATION

PG&E has evaluated the proposed amendment and has determined that the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1) Letter from R. V. Guzman, Office of Nuclear Reactor Regulation, to C. M. Crane, Exelon Nuclear, dated September 28, 2006 (ML062420047) (TAC NOS. MC3567 and MC3568).

2) Letter from H. Neih, Office of Nuclear Reactor Regulation, to A. Pietrangelo, Nuclear Energy Institute, dated September 28, 2006 (ML062700012) (TAC NOS. MB2531 and MD3077).

3) NEI 04-10, Revision 0, dated July 2006.

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

5) Technical Specification Task Force Traveler number TSTF-425, Revision 1, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5," dated April 2007.

6) PG&E Letter DCL-06-141, "Request to be Considered PWR Pilot Plant for Risk-Informed Initiative 5b, Relocate Surveillance Frequencies to Licensee Control," dated December 28, 2006.

7) RG 1.200, Revision 1, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk- Informed Activities," dated January 2007.

8) American Society of Mechanical Engineers (ASME) RA-Sa-2003, Addenda to ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated December 5, 2003.

9) NEI 00-02, Revision A3, "PRA Peer Review Process Guidance," dated March 20, 2000.

Proposed Technical Specification Changes (marked-up)

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 Method for Control of Surveillance Frequencies," Revision 1.

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

1.1 Definitions (continued)

SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing all slave relays and verifying the OPERABILITY of each required slave relay. The SLAVE RELAY TEST shall include a continuity check of associated required testable actuation devices. The SLAVE RELAY TEST may be performed by means of any series of sequential, overlapping, or total steps.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT)	A TADOT shall consist of operating the trip actuating device and verifying the OPERABILITY of all devices in the channel required for trip actuating device OPERABILITY. The TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy. The TADOT may be performed by means of any series of sequential, overlapping or total channel steps.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

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

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify SDM to be within limits.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	-----NOTE----- The predicted reactivity values may 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. -----	
	Verify measured core reactivity is within ± 1% Δk/k of predicted values.	Once prior to entering MODE 1 after each refueling AND -----NOTE----- Only required after 60 EFPD ----- 31 ~~EFPD~~ thereafter

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual rod positions within alignment limit.	~~12 hours~~ ← Insert 1
SR 3.1.4.2	Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 10 steps in either direction.	~~92 days~~ ← Insert 1
SR 3.1.4.3	Verify rod drop time of each rod, from the fully withdrawn position, is ≤ 2.7 seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with: a. T_{avg} ≥ 500 °F; and b. All reactor coolant pumps operating.	Prior to reactor criticality after each removal of the reactor head

3.1 REACTIVITY CONTROL SYSTEMS

3.1.5 Shutdown Bank Insertion Limits

LCO 3.1.5 Each shutdown bank shall be within insertion limits specified in the COLR.

APPLICABILITY: MODE 1, MODE 2 with any control bank not fully inserted.

-----NOTE-----
This LCO is not applicable while performing SR 3.1.4.2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more shutdown banks not within limits.	A.1.1 Verify SDM to be within the limits provided in the COLR. OR A.1.2 Initiate boration to restore SDM to within limit. AND A.2 Restore shutdown banks to within limits.	1 hour 1 hour 2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each shutdown bank is within the limits specified in the COLR.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify estimated critical control bank position is within the limits specified in the COLR.	Within 4 hours prior to achieving criticality
SR 3.1.6.2	Verify each control bank insertion is within the limits specified in the COLR.	~~12 hours~~
SR 3.1.6.3	Verify sequence and overlap limits specified in the COLR are met for control banks not fully withdrawn from the core.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Perform a CHANNEL OPERATIONAL TEST on power range and intermediate range channels per SR 3.3.1.7, SR 3.3.1.8, and Table 3.3.1-1.	Prior to initiation of PHYSICS TESTS
SR 3.1.8.2	Verify the RCS lowest operating loop average temperature is ≥ 531° F.	~~30 minutes~~
SR 3.1.8.3	Verify THERMAL POWER is ≤ 5% RTP.	~~1 hour~~
SR 3.1.8.4	Verify SDM is within the limits provided in the COLR.	~~24 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

--NOTE--
During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained.

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify $F_Q^C(Z)$ is within limit.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP <u>AND</u> Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 20% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified <u>AND</u> 31 ~~EFPD~~ ~~thereafter~~ e

(continued)

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued)	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 20% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified AND ~~31 EFPD thereafter~~

Insert 1

SURVEILLANCE REQUIREMENTS

--NOTE--

During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained.

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify $F^N_{\Delta H}$ is within limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND 31 EFPD thereafter

Insert 1

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD)

LCO 3.2.3 The AFD in % flux difference units shall be maintained within the limits specified in the COLR.

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

APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RTP.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD within limits for each OPERABLE excore channel.	~~7 days~~ ← Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.4.1	-----NOTES----- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER ≤ 75% RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. ---------- Verify QPTR is within limit by calculation.	Insert 1 ~~7 days~~
SR 3.2.4.2	-----NOTE----- Not required to be performed until 12 hours after the input from one or more Power Range Neutron Flux channels is inoperable with THERMAL POWER > 75% RTP. ---------- Verify QPTR is within limit using core power distribution measurement information.	Insert 1 ~~12 hours~~

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.1.2	-----NOTE----- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP, but prior to exceeding 30% RTP. ----- Compare results of calorimetric heat balance calculation to power range channel output. Adjust power range channel output if calorimetric heat balance calculation results exceed power range channel output by more than + 2% RTP.	~~24 hours~~ Insert 1
SR 3.3.1.3	-----NOTE----- Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. ----- Compare results of incore power distribution measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 3%.	Insert 1 ~~31 effective full power days (EFPD)~~
SR 3.3.1.4	-----NOTE----- This Surveillance must be performed on the reactor trip bypass breaker, for the local manual shunt trip only, prior to placing the bypass breaker in service. ----- Perform TADOT.	Insert 1 ~~62 days on a STAGGERED TEST BASIS~~
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.6	-----NOTE----- Not required to be performed until 72 hours after THERMAL POWER ≥ 75% RTP. ----- Calibrate excore channels to agree with incore power distribution measurements.	~~92 EFPD~~ Insert 1
SR 3.3.1.7	-----NOTE----- 1. Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. 2. For source range instrumentation, this Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ----- Perform COT.	~~184 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.8	------NOTE------ This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ------ Perform COT.	------NOTE------ Only required when not performed within previous 184 days ------ Prior to reactor startup **AND** 12 hours after reducing power below P-10 for power and intermediate instrumentation **AND** Four hours after reducing power below P-6 for source range instrumentation **AND** ~~Every 184 days thereafter~~ Insert 1
SR 3.3.1.9	------NOTE------ Verification of setpoint is not required. ------ Perform TADOT.	~~92 days~~ Insert 1
SR 3.3.1.10	------NOTE------ This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ------ Perform CHANNEL CALIBRATION.	~~24 months~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.11	-----NOTE----- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. This Surveillance shall include verification that the time constants are adjusted to the prescribed values. 3. Power and Intermediate Range detector plateau voltage verification is not required to be performed until 72 hours after achieving equilibrium Conditions with Thermal Power ≥ 95% RTP. ----- Perform CHANNEL CALIBRATION.	Insert 1 ~~24 months~~
SR 3.3.1.12	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.1.13	Perform COT.	~~24 months~~
SR 3.3.1.14	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	Insert 1 ~~24 months~~
SR 3.3.1.15	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT	Prior to exceeding the P-9 interlock whenever the unit has been in MODE 3, if not performed in the previous 31 days.
SR 3.3.1.16	-----NOTE----- Neutron detectors are excluded from response time testing. ----- Verify RTS RESPONSE TIMES are within limits.	Insert 1 ~~24 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK. Insert 1 →	~~12 hours~~
SR 3.3.2.2	Perform ACTUATION LOGIC TEST. Insert 1 →	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.2.3	Not used.	
SR 3.3.2.4	Perform MASTER RELAY TEST. Insert 1 →	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.2.5	Perform COT. Insert 1 →	~~184 days~~
SR 3.3.2.6	Perform SLAVE RELAY TEST. Insert 1 →	~~24 months~~
SR 3.3.2.7	Not used.	
SR 3.3.2.8	-----NOTE----- Verification of setpoint not required for manual initiation functions. ----- Perform TADOT.	Insert 1 ↓ ~~24 months~~
SR 3.3.2.9	-----NOTE----- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ----- Perform CHANNEL CALIBRATION.	Insert 1 ↓ ~~24 months~~
SR 3.3.2.10	-----NOTE----- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is ≥ 650 psig. ----- Verify ESF RESPONSE TIMES are within limits.	Insert 1 ↓ ~~24 months on a STAGGERED TEST BASIS~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.11	-----NOTE----- Verification of setpoint not required. ----- Perform TADOT.	Insert 1 ~~24 months~~
SR 3.3.2.12	Perform ACTUATION LOGIC TEST	~~24 months~~
SR 3.3.2.13	-----NOTE----- Verification of setpoint not required for manual initiation functions. ----- Perform TADOT	Insert 1 ~~18 months~~

SURVEILLANCE REQUIREMENTS

---NOTE---

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

	SURVEILLANCE	FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~ Insert 1
SR 3.3.3.2	---------------------------NOTE--------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	Insert 1 ~~24 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel.	~~31 days~~ Insert 1
SR 3.3.4.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	~~24 months~~ Insert 1
SR 3.3.4.3	------------------------------NOTE------------------------------ Reactor Trip Breaker position is excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION for each required instrumentation channel.	Insert 1 ~~24 months~~

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 One channel per bus of loss of voltage DG start Function; and two channels per bus of degraded voltage Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources-Shutdown."

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more channels per bus inoperable.	A.1 -----NOTE----- One channel may be bypassed for up to 2 hours for surveillance testing. ---------- Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Not used	
SR 3.3.5.2	Perform TADOT.	-----NOTE----- For Unit 1 Cycle 13, SR is due prior to first entry into MODE 4. ---------- 18 months

(continued)

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.5.3	Perform CHANNEL CALIBRATION with Allowable Value setpoints as follows: a. Loss of voltage Diesel Start Allowable Value ≥ 0 V with a time delay of ≤ 0.8 seconds and ≥ 2583 V with a ≤ 10 second time delay. Loss of voltage initiation of load shed with one relay Allowable Value ≥ 0 V with a time delay of ≤ 4 seconds and ≥ 2583 V with a time delay ≤ 25 seconds and with one relay Allowable Value ≥ 2870 V, instantaneous. b. Degraded voltage Diesel Start Allowable Value ≥ 3785 V with a time delay of ≤ 10 seconds. Degraded voltage initiation of Load Shed Allowable Value ≥ 3785 V with a time delay of ≤ 20 seconds.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.6.2	-----NOTE----- This surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. ----- Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~ Insert 1
SR 3.3.6.3	-----NOTE----- This surveillance is only applicable to the master relays of the ESFAS Instrumentation. ----- Perform MASTER RELAY TEST.	~~92 days on a STAGGERED TEST BASIS~~ Insert 1
SR 3.3.6.4	Perform CFT.	~~92 days~~
SR 3.3.6.5	Perform SLAVE RELAY TEST.	~~24 months~~
SR 3.3.6.6	Not used	
SR 3.3.6.7	Perform CHANNEL CALIBRATION.	~~24 months~~
SR 3.3.6.8	Verify ESF Containment Ventilation Isolation RESPONSE TIME is within limits.	~~24 months on a STAGGERED TEST BASIS.~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time for Condition A or B not met during movement of recently irradiated fuel assemblies.	D.1	Suspend movement of recently irradiated fuel assemblies.	Immediately
E. Required Action and associated Completion Time for Condition A or B not met in MODE 5 or 6.	E.1	Initiate action to restore one CRVS train to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.7.2	Perform CFT.	~~92 days~~
SR 3.3.7.3	Perform ACTUATION LOGIC TEST.	~~92 days~~
SR 3.3.7.4	Perform MASTER RELAY TEST.	~~92 days~~
SR 3.3.7.5	Perform SLAVE RELAY TEST.	~~92 days~~
SR 3.3.7.6	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	~~18 months~~
SR 3.3.7.7	Perform CHANNEL CALIBRATION	~~18 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

---NOTE---

Refer to Table 3.3.8-1 to determine which SRs apply for each FBVS Actuation Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.8.2	Perform CFT.	92 days
SR 3.3.8.3	Not used	
SR 3.3.8.4	---------------NOTE--------------- Verification of setpoint is not required. ---------------------------------- Perform TADOT.	18 months
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	18 months

Insert 1

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits

LCO 3.4.1 RCS DNB parameters for pressurizer pressure, RCS average temperature, and RCS total flow rate shall be within the limits specified below:

a. Pressurizer pressure is greater than or equal to the limit specified in the COLR;

b. RCS average temperature is less than or equal to the limit specified in the COLR; and

c. RCS total flow rate within limits shown on Table 3.4.1-1 for Unit 1 and Table 3.4.1-2 for Unit 2.

APPLICABILITY: MODES 1.

--NOTE--
Pressurizer pressure limit does not apply during:

a. THERMAL POWER ramp > 5% RTP per minute; or

b. THERMAL POWER step > 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more RCS DNB parameters not within limits.	A.1 Restore RCS DNB parameter(s) to within limit.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is greater than or equal to the limit specified in the COLR.	12 hours
SR 3.4.1.2	Verify RCS average temperature is less than or equal to the limit specified in the COLR.	12 hours
SR 3.4.1.3	Verify RCS total flow rate is within limits.	12 hours
SR 3.4.1.4	Verify measured RCS total flow rate is within limits.	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each operating RCS loop average temperature (Tavg) shall be ≥ 541°F.

APPLICABILITY: MODES 1,
MODE 2 with $k_{eff} \geq 1.0$.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. T_{avg} in one or more operating 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 operating loop ≥ 541 °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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops-MODES 1 and 2

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

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.4.1 Verify each RCS loop is in operation.	~~12 hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Four RCS loops inoperable. OR No RCS loop in operation.	D.1 Place the Rod Control System in a condition incapable of rod withdrawal. AND D.2 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 D.3 Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.5.1	Verify required RCS loops are in operation.	~~12 hours~~
SR 3.4.5.2	Verify steam generator secondary side water levels are ≥ 15% for required RCS loops.	~~12 hours~~
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	~~7 days~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two required loops inoperable. OR	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.	Immediately
	AND		
No RCS or RHR loop in operation.	B.2	Initiate action to restore one loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify one RHR or RCS loop is in operation.	12 hours
SR 3.4.6.2	Verify SG secondary side water levels are ≥ 15% for required RCS loops.	12 hours
SR 3.4.6.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

Insert 1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable. AND Required SGs secondary side water levels not within limits.	A.1 Initiate action to restore a second RHR loop to OPERABLE status. OR A.2 Initiate action to restore required SG secondary side water levels to within limits.	Immediately Immediately
B. Required RHR loops inoperable. OR No RHR loop 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 RHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	~~12 hours~~
SR 3.4.7.2	Verify SG secondary side water level is ≥ 15% in required SGs.	~~12 hours~~
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	~~7 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one RHR loop is in operation.	~~12 hours~~
SR 3.4.8.2	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is ≤ 90%.	~~12 hours~~
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters is ≥ 150 kW.	~~24 months~~
SR 3.4.9.3	Verify by transferring power, that required pressurizer heaters can be powered from an emergency power supply.	~~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 a complete cycle of each block valve.	~~92 days~~ Insert 1
SR 3.4.11.2	------NOTE------ Required to be performed during MODES 3 or 4. ------ Perform a complete cycle of each PORV.	In accordance with the IST Plan.
SR 3.4.11.3	Demonstrate OPERABILITY of the safety related nitrogen supply for the Class I PORVs.	~~24 months~~ Insert 1
SR 3.4.11.4	Perform a COT on each required Class 1 PORV, excluding actuation.	~~92 days~~ Insert 1
SR 3.4.11.5	Perform CHANNEL CALIBRATION for each required Class 1 PORV actuation channel.	~~24 months~~ Insert 1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. (continued) LTOP System inoperable for any reason other than Condition A, B, C, D, E, or F.		

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify a maximum of zero safety injection pumps are capable of injecting into the RCS.	~~12 hours~~ Insert 1
SR 3.4.12.2	Verify a maximum of one centrifugal charging pump is capable of injecting into the RCS.	~~12 hours~~ Insert 1
SR 3.4.12.3	Verify each accumulator is isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.	~~12 hours~~ Insert 1
SR 3.4.12.4	Not used	
SR 3.4.12.5	Verify required RCS vent ≥ 2.07 square inches open.	~~12 hours for unlocked open vent valve(s). AND 31 days for vent valve(s) locked open, sealed, or otherwise secured in the open position.~~ Insert 1
SR 3.4.12.6	Verify PORV block valve is open for each required Class I PORV.	~~72 hours~~ Insert 1
SR 3.4.12.7	Not used	

(continued)

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.8	----------NOTE---------- Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to ≤ LTOP arming temperature specified in the PTLR. ------------------------------ Perform a COT on each required Class 1 PORV, excluding actuation.	~~31 days~~ Insert 1
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required Class I PORV actuation channel.	~~24 months~~ Insert 1

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.1	Isolate the high pressure portion of the affected system from the low pressure portion by use of a second closed manual, deactivated automatic, or check valve.	72 hours
		OR	
	A.2.2	Restore RCS PIV to within limits.	72 hours
B. Required Action and associated Completion Time for Condition A not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	-----NOTES----- 1. Not required to be performed in MODES 3 and 4. 2. Not required to be performed on the RCS PIVs located in the RHR flow path when in the shutdown cooling mode of operation. 3. RCS PIVs actuated during the performance of this Surveillance are not required to be tested more than once if a repetitive testing loop cannot be avoided. ---------- Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2215 psig and ≤ 2255 psig.	In accordance with the Inservice Testing Program, ~~and~~ 24 ~~months~~ AND (continued)

INSERT 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours
E. All required monitors inoperable.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate and gaseous radioactivity monitors.	~~12 hours~~
SR 3.4.15.2	Perform CHANNEL FUNCTIONAL TEST of the required containment atmosphere particulate and gaseous radioactivity monitors.	~~92 days~~
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump monitors.	~~24 months~~
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate and gaseous radioactivity monitors.	~~18 months~~
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required CFCU condensate collection monitors.	~~24 months~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	---NOTE--- Only required to be performed in MODE 1. --- Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 600.0 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.	Insert 1 ~~14 days~~ AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Accumulators

LCO 3.5.1 Four ECCS accumulators shall be OPERABLE.

APPLICABILITY: MODES 1 and 2, MODE 3 with RCS pressure > 1000 psig.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One accumulator inoperable due to boron concentration not within limits.	A.1 Restore boron concentration to within limits.	72 hours
B. One accumulator inoperable for reasons other than Condition A.	B.1 Restore accumulator to OPERABLE status.	24 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 $\leq$ 1000 psig.	6 hours 12 hours
D. Two or more accumulators inoperable.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify borated water volume in each accumulator is $\geq$ 814 ft^3 and $\leq$ 886 ft^3.	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is $\geq$ 579 psig and $\leq$ 664 psig.	12 hours

(continued)

Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2200 ppm and ≤ 2500 ppm. Insert 1	~~31 days~~ e AND ---------NOTE------- Only required to be performed for affected accumulators. ------------------------- Once within 6 hours after each solution volume increase of ≥ 5.6% of narrow range indicated level that is not the result of addition from the refueling water storage tank.
SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is > 1000 psig.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed.	~~12 hours~~ Insert 1

Number	Position	Function
8703	Closed	RHR to RCS Hot Legs
8802A	Closed	Safety Injection to RCS Hot Legs
8802B	Closed	Safety Injection to RCS Hot Legs
8809A	Open	RHR to RCS Cold Legs
8809B	Open	RHR to RCS Cold Legs
8835	Open	Safety Injection to RCS Cold Legs
8974A	Open	Safety Injection Pump Recirc. to RWST
8974B	Open	Safety Injection Pump Recirc. to RWST
8976	Open	RWST to Safety Injection Pumps
8980	Open	RWST to RHR Pumps
8982A	Closed	Containment Sump to RHR Pumps
8982B	Closed	Containment Sump to RHR Pumps
8992	Open	Spray Additive Tank to Eductor
8701	Closed	RHR Suction
8702	Closed	RHR Suction

	SURVEILLANCE	FREQUENCY
SR 3.5.2.2	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.5.2.3	Verify ECCS piping is full of water.	~~31 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program.
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each mechanical position stop is in the correct position. Charging Injection Throttle Valves: 8810A, 8810B, 8810C, 8810D Safety Injection Throttle Valves: 8822A, 8822B, 8822C, 8822D	~~24 months~~ Insert 1
SR 3.5.2.8	Verify, by visual inspection, each ECCS train containment recirculation sump suction inlet is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	~~24 months~~ Insert 1

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RWST boron concentration not within limits. OR RWST borated water temperature not within limits.	A.1 Restore RWST to OPERABLE status.	8 hours
B. RWST inoperable for reasons other than Condition A.	B.1 Restore RWST to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	---NOTE--- Only required to be performed when ambient air temperature is < 35°F. --- Verify RWST borated water temperature is ≥ 35°F.	Insert 1 ~~24 hours~~
SR 3.5.4.2	Verify RWST borated water volume is ≥ 400,000 gallons (81.5% indicated level).	~~7 days~~
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2300 ppm and ≤ 2500 ppm.	~~7 days~~

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow resistance shall be ≥ 0.2117 ft/gpm^2.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Seal injection flow resistance not within limit.	A.1 Adjust manual seal injection throttle valves to give a flow resistance within limit.	4 hours
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 3.5.5.1	-------------------------NOTE------------------------------ Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig. --- Verify manual seal injection throttle valves are adjusted to give a flow resistance ≥ 0.2117 ft/gpm^2.	~~31 days~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more containment air locks inoperable for reasons other than Condition A or B.	C.1 Initiate action to evaluate overall containment leakage rate per LCO 3.6.1.	Immediately
	AND	
	C.2 Verify a door is closed in the affected air lock.	1 hour
	AND	
	C.3 Restore air lock to OPERABLE status.	24 hours
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 5.	36 hours

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

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1	Not used	
SR 3.6.3.2	Verify each 48 inch containment purge supply and exhaust and 12 inch vacuum/pressure relief valve is closed, except when these valves are open for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open.	~~31 days~~ Insert 1
SR 3.6.3.3	-----------------------------NOTE-------------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. --- Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	~~31 days~~ Insert 1
SR 3.6.3.4	-----------------------------NOTE-------------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. --- Verify each containment isolation manual valve and blind flange that is located inside containment and not locked, sealed or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days
SR 3.6.3.5	Verify the isolation time of each automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.6	Not used	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.3.7	----------------------------NOTE-------------------------- This surveillance is not required when the penetration flow path is isolated by a leak tested blank flange. -- Perform leakage rate testing for containment purge supply and exhaust and vacuum/pressure relief valves with resilient seals.	Insert 1 ~~24 months~~ AND For containment purge supply and exhaust valves only, within 92 days after opening the valve
SR 3.6.3.8	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.6.3.9	Not used	
SR 3.6.3.10	Verify each 12 inch containment vacuum/pressure relief valve is blocked to restrict the valve from opening > 50°.	~~24 months~~ Insert 1
SR 3.6.3.11	Not used	

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -1.0 psig and ≤ +1.2 psig.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment pressure not within limits.	A.1	Restore containment pressure to within limits.	4 hours
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	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 AND	Be in MODE 3.	6 hours
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	Verify containment average air temperature is within limit.	~~24 hours~~ ← Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.6.1	Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	31 days
SR 3.6.6.2	Operate each CFCU for ≥ 15 minutes.	31 days
SR 3.6.6.3	Verify component cooling water flow rate to each required CFCU is ≥ 1650 gpm.	31 days
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24 months
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	24 months
SR 3.6.6.7	Verify each CFCU starts automatically on an actual or simulated actuation signal.	24 months
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	10 years
SR 3.6.6.9	Verify each CFCU starts on low speed.	31 days

Insert 1

3.6 CONTAINMENT SYSTEMS

3.6.7 Spray Additive System

LCO 3.6.7 The Spray Additive System shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spray Additive System inoperable.	A.1 Restore Spray Additive System to OPERABLE status.	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 each spray additive manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	~~31 days~~
SR 3.6.7.2	Verify spray additive tank solution volume is ≥ 46.2% and ≤ 91.9%.	~~184 days~~
SR 3.6.7.3	Verify spray additive tank NaOH solution concentration is ≥ 30% and ≤ 32% by weight.	~~184 days~~
SR 3.6.7.4	Verify each spray additive automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~24 months~~
SR 3.6.7.5	Verify spray additive flow from each solution's flow path.	~~5 years~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	------NOTE------ Only required to be performed in MODES 1 and 2. ------ Verify closure time of each MSIV is ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.7.2.2	------NOTE------ Only required to be performed in MODES 1 and 2. ------ Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.3.3	Verify each MFIV, MFRV, MFRV bypass valve, and MFWP turbine stop valve actuates to the closed position on an actual or simulated actuation signal.	~~24 months~~ Insert 1
SR 3.7.3.4	Verify the closure time of each MFWP turbine stop valve is ≤ 1 second.	At each COLD SHUTDOWN, but not more frequently than once per 92 days.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.4.1	Verify one complete cycle of each ADV.	24 months
SR 3.7.4.2	Verify one complete cycle of each ADV block valve.	In accordance with the Inservice Testing Program
SR 3.7.4.3	Verify that the backup air bottle for each ADV has a pressure ≥ 260 psig.	24 hours

Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.5.1	Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, 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 for the turbine driven AFW pump until 24 hours after ≥ 650 psig in the steam generator. --- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Test Program.
SR 3.7.5.3	---------------------------NOTE--------------------------- Not applicable in MODE 4 when steam generator is relied upon for heat removal. --- 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.	Insert 1 ~~24 months~~
SR 3.7.5.4	---------------------------NOTES--------------------------- 1. Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 650 psig in the steam generator. 2. Not applicable in MODE 4 when generator is relied upon for heat removal. --- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	Insert 1 ~~24 months~~
SR 3.7.5.5	Not used.	
SR 3.7.5.6	Verify the FWST is capable of being aligned to the AFW system by cycling each FWST valve in the flow path necessary for realignment through at least one full cycle.	~~24 months~~ Insert 1

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST) and Fire Water Storage Tank (FWST)

LCO 3.7.6 The CST level shall be ≥ 41.3% and the FWST level shall be ≥ 22.2% for one unit operation and ≥ 41.7% for two unit operation.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CST or FWST level not within limit.	A.1 Verify by administrative means OPERABILITY of backup water supply.	4 hours AND Once per 12 hours thereafter
	AND A.2 Restore CST or FWST level to within limit.	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.	18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST level is ≥ 41.3%.	~~12 hours~~
SR 3.7.6.2	Verify the FWST level is ≥ 22.2% for one unit operation and ≥ 41.7% for two unit operation.	~~12 hours~~

Insert 1

3.7 PLANT SYSTEMS

3.7.7 Vital Component Cooling Water (CCW) System

LCO 3.7.7 Two vital CCW loops shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One vital CCW loop inoperable.	A.1 ------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ---------------------------------- Restore vital CCW loop to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	----------------------------NOTE--------------------------- Isolation of CCW flow to individual components does not render the 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.	Insert 1 ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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~~
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	~~24 months~~

Insert 1

3.7 PLANT SYSTEMS

3.7.8 Auxiliary Saltwater (ASW) System

LCO 3.7.8 Two ASW trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ASW train inoperable.	A.1 ------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by ASW. ---------------------------------- Restore ASW train to OPERABLE status	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify each ASW manual and power operated, valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.7.8.2	Verify each ASW power operated valve in the flow path that is not locked, sealed, or otherwise secured in position, can be moved to the correct position.	In accordance with the Inservice Test Program.
SR 3.7.8.3	Verify each ASW pump starts automatically on an actual or simulated actuation signal.	~~24 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two CRVS trains inoperable in MODE 5 OR 6, or during movement of recently irradiated fuel assemblies.	E.1 Suspend movement of recently irradiated fuel assemblies.	Immediately
F. Two CRVS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.10.1	Operate each CRVS train for ≥ 15 minutes.	31 days
SR 3.7.10.2	Verify that each CRVS redundant fan is aligned to receive electrical power from a separate OPERABLE vital bus.	31 days
SR 3.7.10.3	Perform required CRVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with VFTP
SR 3.7.10.4	Verify each CRVS train automatically switches into the pressurization mode of operation on an actual or simulated actuation signal.	24 months
SR 3.7.10.5	Verify one CRVS train can maintain a positive pressure of ≥ 0.125 inches water gauge, relative to the outside atmosphere during the pressurization mode of operation.	24 months on a STAGGERED TEST BASIS

Insert 1

3.7 PLANT SYSTEMS

3.7.12 Auxiliary Building Ventilation System (ABVS)

LCO 3.7.12 Two ABVS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. The common HEPA filter and/or charcoal adsorber inoperable.	A.1	Restore the common HEPA filter and charcoal adsorber to OPERABLE status.	24 hours
B. One ABVS train inoperable.	B.1	Restore ABVS train to OPERABLE status	7 days
C. Required Action and associated Completion Time not met.	C.1 AND	Be in MODE 3.	6 hours
	C.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	-- This surveillance shall verify that each ABVS train is aligned to receive electrical power from a separate OPERABLE vital bus. -- Operate each ABVS train for ≥ 15 minutes.	Insert 1 ~~31 days~~
SR 3.7.12.2	Perform required ABVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.3	------------------------NOTE------------------------------ SR is not applicable to a specific ABVS train when that ABVS train is configured and performing its safety function. -- Verify each ABVS train actuates on an actual or simulated actuation signal and the system realigns to exhaust through the common HEPA filter and charcoal adsorber.	Insert 1 ~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.12.4	Not Used.	
SR 3.7.12.5	Not Used.	
SR 3.7.12.6	Verifying that leakage through the ABVS Dampers M2A and M2B is less than or equal to 5 cfm when subjected to a Constant Pressure or Pressure Decay Leak Rate Test in accordance with ASME N510-1989. The test pressure for the leak rate test shall be based on a maximum operating pressure as defined in ASME N510-1989, of 8 inches water gauge.	~~24 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each FHBVS train for ≥ 15 minutes.	~~31 days~~
SR 3.7.13.2	Perform required FHBVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.13.3	Verify each FHBVS train actuates on an actual or simulated actuation signal.	~~24 months~~
SR 3.7.13.4	Verify one FHBVS train can maintain a pressure ≤ -0.125 inches water gauge with respect to atmospheric pressure during the post accident mode of operation.	~~24 months on a STAGGERED TEST BASIS~~
SR 3.7.13.5	Verify damper M-29 can be closed.	~~24 months~~

Insert 1

3.7 PLANT SYSTEMS

3.7.15 Spent Fuel Pool Water Level

LCO 3.7.15 The spent fuel pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

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

ACTIONS

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 the spent fuel pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the spent fuel pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	~~7 days~~ Insert 1

3.7 PLANT SYSTEMS

3.7.16 Spent Fuel Pool Boron Concentration

LCO 3.7.16 The spent fuel pool boron concentration shall be ≥ 2000 ppm.

APPLICABILITY: When fuel assemblies are stored 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 Initiate action to restore spent fuel pool boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the spent fuel pool boron concentration is within limit.	~~7 days~~

Insert 1

3.7 PLANT SYSTEMS

3.7.18 Secondary Specific Activity

LCO 3.7.18 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. <u>AND</u> A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.18.1	Verify the specific activity of the secondary coolant is ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.	~~31 days~~ e Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	~~7 days~~ Insert 1
SR 3.8.1.2	-----NOTES----- 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. ----- Verify each DG starts from standby conditions and achieves speed ≥ 900 rpm, steady state voltage ≥ 3785 V and ≤ 4400 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	Insert 1 ~~31 days~~
SR 3.8.1.3	-----NOTES----- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. ----- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2340 kW and ≤ 2600 kW.	Insert 1 ~~31 days~~
SR 3.8.1.4	Verify each day tank contains ≥ 250 gal of fuel oil.	~~31 days~~
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	~~31 days~~
SR 3.8.1.6	Verify the fuel oil transfer system operates to transfer fuel oil from storage tanks to the day tank.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.7	---NOTE--- All DG starts may be preceded by an engine prelube period. --- Verify each DG starts from standby condition and achieves: a. in ≤ 10 seconds, speed ≥ 900 rpm; and b. in ≤ 13 seconds, voltage ≥ 3785 V and ≤ 4400 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~ Insert 1
SR 3.8.1.8	---NOTE--- This Surveillance shall not normally be performed for automatic transfers 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. --- Verify automatic and manual transfer of AC power sources from the normal offsite circuit to the alternate required offsite circuit and manual transfer from the alternate offsite circuit to the delayed access circuit.	Insert 1 ~~24 months~~
SR 3.8.1.9	---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. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. --- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 63 Hz; b. Within 2.4 seconds following load rejection, the voltage is ≥ 3785 V and ≤ 4400 V; and c. Within 2.4 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	Insert 1 ~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.10	Verify each DG operating at a power factor ≤ 0.87 does not trip and voltage is maintained ≤ 5075 V during and following a load rejection of ≥ 2340 kW and ≤ 2600 kW.	~~24 months~~ Insert 1
SR 3.8.1.11	-----------------------------NOTES----------------------------- 1. All DG 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. --- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤10 seconds, 2. energizes auto-connected loads through auto-transfer sequencing timers, 3. maintains steady state voltage ≥ 3785 V and ≤ 4400 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected loads for ≥ 5 minutes.	~~24 months~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.12	-----NOTES----- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify on an actual or simulated Safety Injection signal each DG auto-starts from standby condition and: a. In ≤ 13 seconds after auto-start and during tests, achieves voltage ≥ 3785 V and ≤ 4400 V; b. In ≤ 13 seconds after auto-start and during tests, achieves frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads are energized from the alternate offsite power source; and e. Emergency loads are auto-connected through the ESF load sequencing timers to the alternate offsite power source.	~~24 months~~ Insert 1
SR 3.8.1.13	Verify each DG's automatic trips are bypassed when the diesel engine trip cutout switch is in the cutout position and the DG is aligned for automatic operation except: a. Engine overspeed; b. Generator differential current; and c. Low lube oil pressure;	~~24 months~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.14	-----NOTES----- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. ---------- Verify each DG operating at a power factor ≤0.87 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 2600 kW and ≤ 2860 kW; and b. For the remaining hours of the test loaded ≥ 2340 kW and ≤ 2600 kW.	~~24 months~~ Insert 1
SR 3.8.1.15	-----NOTES----- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 2340 kW and ≤ 2600 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts and achieves: a. in ≤ 10 seconds, speed ≥ 900 rpm; and b. in ≤ 13 seconds, voltage ≥ 3785 V, and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	Insert 1 ~~24 months~~
SR 3.8.1.16	-----NOTE----- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power;	Insert 1 ~~24 months~~

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.16 (continued)	b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	
SR 3.8.1.17	-----NOTE----- 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. ---------- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated Safety Injection signal overrides the test mode by: a. Opening the auxiliary transformer breaker; and b. Automatically sequencing the emergency loads onto the DG.	~~24 months~~ Insert 1
SR 3.8.1.18	-----NOTE----- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify each ESF and auto-transfer load sequencing timer is within its limits.	Insert 1 ~~24 months~~
SR 3.8.1.19	-----NOTES----- 1. All DG 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. ----------	

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.19 (continued)	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated Safety Injection signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through load sequencing timers, 3. achieves steady state voltage ≥ 3785 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	~~24 months~~ Insert 1
SR 3.8.1.20	---NOTE--- All DG starts may be preceded by an engine prelube period. --- Verify when started simultaneously from standby condition, each DG achieves: a. in ≤ 10 seconds, speed ≥ 900 rpm; and b. in ≤ 13 seconds, voltage ≥ 3785 V and ≤ 4400 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	Insert 1 ~~10 years~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify fuel oil storage tanks contain combined storage within limits.	~~31 days~~ Insert 1
SR 3.8.3.2	Verify lubricating oil inventory is ≥ 650 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 DG has at least one air start receiver with a pressure is ≥ 180 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
SR 3.8.3.6	Verify each DG turbocharger air assist air receiver pressure is ≥ 180 psig.	~~31 days~~ Insert 1

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 battery charger supplies ≥ 400 amps at greater than or equal to the minimum established float voltage for ≥ 4 hours. OR Verify each battery charger can recharge the battery to the fully charged state within 12 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.	~~24 months~~ 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. ----- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	Insert 1 ~~24 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.6.1	------------------------------NOTE------------------------------ Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. --- Verify each battery float current is ≤ 2 amps.	Insert 1 ~~7 days~~
SR 3.8.6.2	Verify each battery pilot cell voltage is ≥ 2.07 V.	~~31 days~~
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	~~31 days~~
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	~~31 days~~
SR 3.8.6.5	Verify each battery connected cell voltage is ≥ 2.07 V.	~~92 days~~
SR 3.8.6.6	------------------------------NOTE------------------------------ This Surveillance shall not be performed in MODE 1, 2, 3, or 4. --- Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	~~60 months~~ AND 24 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating. AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters-Operating

LCO 3.8.7 Four Class 1E Vital 120 V UPS inverters shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required inverter inoperable.	A.1 -----------NOTE--------------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating" with any vital 120 V AC bus de-energized. --------------------------------- Restore inverter to OPERABLE status.	24 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 3.8.7.1	Verify correct inverter voltage and alignment to required AC vital buses.	7 days ← Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage, and alignments to required AC vital buses.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required AC, DC, and 120 VAC vital bus electrical power distribution subsystems.	~~7 days~~ Insert 1

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.4	Initiate actions to restore required AC, DC, and 120 VAC vital bus electrical power distribution subsystems to OPERABLE status.	Immediately
		AND	
	A.2.5	Declare associated required residual 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 120 VAC 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 all filled portions of the Reactor Coolant System, the refueling canal, and the refueling cavity, that have direct access to the reactor vessel, shall be maintained within the limit specified in the COLR.

APPLICABILITY: MODE 6

ACTIONS

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

SURVEILLANCE REQUIREMENTS

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

3.9 REFUELING OPERATIONS

3.9.3 Nuclear Instrumentation

LCO 3.9.3 Two source range neutron flux monitors shall be OPERABLE.

APPLICABILITY: MODE 6

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required source range neutron flux monitor inoperable.	A.1 Suspend CORE ALTERATIONS except for latching control rod drive shafts and friction testing of individual control rods.	Immediately
	AND	
	A.2 Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.	Immediately
B. Two required source range neutron flux monitors inoperable.	B.1 Initiate action to restore one source range neutron flux monitor to OPERABLE status.	Immediately
	AND	
	B.2 Perform SR 3.9.1.1.	Once per 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Perform CHANNEL CHECK.	~~12 hours~~ ← Insert 1
SR 3.9.3.2	-----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. ----- Perform CHANNEL CALIBRATION.	Insert 1 ~~24 months~~

3.9 REFUELING OPERATIONS

3.9.4 Containment Penetrations

LCO 3.9.4 The containment penetrations shall be in the following status:

a. The equipment hatch capable of being closed and held in place by four bolts;

b. One door in each air lock capable of being closed; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or
2. capable of being closed by an OPERABLE Containment Purge and Exhaust Isolation valve.

-------------------------------NOTE-------------------------------
Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls.

APPLICABILITY: During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	~~7 days~~ ← Insert 1
SR 3.9.4.2	Verify each required containment purge and exhaust ventilation isolation valves actuates to the isolation position on an actual or simulated actuation signal.	~~24 months~~ ← Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.5.1	With the reactor subcritical less than 57 hours, verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 3000 gpm,	~~12 hours~~
	OR	
	With the reactor subcritical for 57 hours or more, verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 1300 gpm.	~~12 hours~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	With the reactor subcritical less than 57 hours, verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 3000 gpm, OR With the reactor subcritical for 57 hours or more, verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 1300 gpm.	~~12 hours~~ ← Insert 1 ~~12 hours~~ ← Insert 1
SR 3.9.6.2	Verify correct breaker alignment and indicated power available to the required RHR pump that is not in operation.	~~7 days~~ ← Insert 1

3.9 REFUELING OPERATIONS

3.9.7 Refueling Cavity Water Level

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

APPLICABILITY: During movement of irradiated fuel assemblies within containment.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify refueling cavity water level is ≥ 23 ft above the top of reactor vessel flange.	~~24 hours~~ ← Insert 1

5.5 Programs and Manuals (continued)

5.5.17 Battery Monitoring and Maintenance Program

This Program provides for restoration and maintenance, based on the recommendations of IEEE Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," or of the battery manufacturer, of the following:

a. Actions to restore battery cells with float voltage < 2.13 V, and

b. Actions to equalize and test battery cells that have been discovered with electrolyte level below the top of the plates.

Insert 2

Changes to Technical Specification Bases Pages
(For information only)

Insert 1

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

BASES

SURVEILLANCE REQUIREMENTS	SR 3.1.1.1 (continued) 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. Insert 1 → The Frequency of 24 hours is based on the generally slow change in required boron concentration and the low probability of an accident occurring without the required SDM. This allows time for the operator to collect the required data, which includes performing a boron concentration analysis, and complete the calculation.
REFERENCES	1 10 CFR 50, Appendix A, GDC 26. 2 FSAR, Chapter 15, Section 15.4.2.1. 3 FSAR, Chapter 15, Section 15.2.4. 4 10 CFR 100. 5 FSAR, Chapter 15, Section 15.4.6.1.6.

BASES

ACTIONS (continued)	B.1 If the core reactivity cannot be restored to within the 1% Δk/k limit, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours. If the SDM for MODE 3 is not met, then the boration required by LCO 3.1.1 Required Action A.1 would occur. The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems.
SURVEILLANCE REQUIREMENTS	SR 3.1.2.1 Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made, considering that other core conditions are fixed or stable, including control rod position, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed prior to entering MODE 1 as an initial check on core conditions and design calculations at BOC. The SR is modified by a Note. The Note indicates that the normalization (adjustment, only if necessary) 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 changes due to fuel depletion and the presence of other indicators (QPTR, AFD, etc.) for prompt indication of an anomaly. Insert 1
REFERENCES	1. 10 CFR 50, Appendix A, GDC 26, GDC 28, and GDC 29. 2. FSAR, Chapter 15.

BASES

ACTIONS (continued)

D.2

If more than one rod is found to be misaligned or becomes misaligned because of bank movement, the unit conditions fall outside of the accident analysis assumptions. Since automatic bank sequencing would continue to cause misalignment, the unit must be brought to a MODE or Condition in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours.

The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

Verification that individual rod positions are within alignment limits at a Frequency of 12 hours provides a history that allows the operator to detect a rod that is beginning to deviate from its expected position. 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 1

SR 3.1.4.2

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

Insert 1

SR 3.1.4.3

Verification of rod drop times allows the operator to determine that the maximum rod drop time permitted is consistent with the assumed rod drop time used in the safety analysis. Measuring rod drop times prior

(continued)

BASES

ACTIONS (continued)	B.1 If the shutdown banks cannot be restored to within their insertion limits within 2 hours, the unit must be brought to a MODE where the LCO is not applicable. The allowed Completion Time of 6 hours is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.
SURVEILLANCE REQUIREMENTS	SR 3.1.5.1 Verification that the shutdown banks are within their insertion limits prior to an approach to criticality ensures that when the reactor is critical, or being taken critical, the shutdown banks will be available to shut down the reactor, and the required SDM will be maintained following a reactor trip. This SR and Frequency ensure that the shutdown banks are withdrawn before the control banks are withdrawn during a unit startup. Since the shutdown banks are positioned manually by the control room operator, a verification of shutdown bank position ~~at a Frequency of 12 hours~~, after the reactor is taken critical, is adequate to ensure that they are within their insertion limits. ~~Also, the 12 hour Frequency takes into account other information available in the control room for the purpose of monitoring the status of shutdown rods.~~ Insert 1
REFERENCES	1. 10 CFR 50, Appendix A, GDC 10, GDC 26, and GDC 28. 2. 10 CFR 50.46. 3. FSAR, Chapter 15, Section 15.4.3.2.4.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

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

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

SR 3.1.6.2

Insert 1 →

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

SR 3.1.6.3

When control banks are maintained within their insertion limits as checked by SR 3.1.6.2 above, it is unlikely that their sequence and overlap will not be in accordance with requirements provided in the COLR. The verification of compliance with the sequence and overlap limits specified in the COLR consists of an observation that the static rod positions of those control banks not fully withdrawn from the core are within the limits specified in the COLR. Bank sequence and overlap must also be maintained during rod movement, implicit within the LCO.

Insert 1 →

A Frequency of 12 hours is consistent with the insertion limit check above in SR 3.1.6.2.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 10, GDC 26, GDC 28.
2. 10 CFR 50.46.
3. FSAR, Chapter 4, Section 4.3.2.4.
4. FSAR, Chapter 4, Section 4.3.2.4.
5. WCAP-9273-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

BASES

ACTIONS (continued)

D.1

If the Required Actions cannot be completed within the associated Completion Time, 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 an additional 15 minutes. The Completion Time of 15 additional minutes is reasonable, based on operating experience, for reaching MODE 3 in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.8.1

A CHANNEL OPERATIONAL TEST is required on each power range and intermediate range nuclear instrument in MODES 1 and 2 by LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." SR 3.1.8.1 verifies that the above surveillances are current on all bistables, ensuring that the RTS is properly aligned to provide the required degree of core protection prior to initiation and during the performance of PHYSICS TESTS.

SR 3.1.8.2

Verification that the RCS lowest operating loop T_{avg} is ≥ 531°F will ensure that the unit is not operating in a condition that could invalidate the safety analyses. Verification of the RCS temperature at a Frequency of 30 minutes during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.

Insert 1

SR 3.1.8.3

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

Insert 1

SR 3.1.8.4

Verification that the SDM is within limits specified in the COLR ensures that, for the specific RCCA and RCS temperature manipulations performed during PHYSICS TESTS, the plant is not operating in a condition that could invalidate the safety analysis assumptions.

The SDM for physics testing during tests where traditional SDM monitoring techniques are not adequate, is determined for the most restrictive test based on design calculations. Plant conditions are monitored during these tests to verify adequate SDM.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.8.4 (continued)

Insert 1 →

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.

REFERENCES

1. 10 CFR 50, Appendix B, Section XI.
2. 10 CFR 50.59.
3. Regulatory Guide 1.68, Revision 2, August, 1978.
4. Not used.
5. WCAP-9273-NP-A, "Westinghouse Reload Safety Evaluation Methodology Report," July 1985.
6. WCAP-11618, including Addendum 1, April 1989.

BASES

SURVEILLANCE REQUIREMENTS (continued)

at RTP (or any other level for extended operation). Equilibrium conditions are achieved when the core is sufficiently stable such that the uncertainties associated with the measurement are valid. In the absence of these Frequency conditions, it is possible to increase power to RTP and operate for 31 days without verification of $F_Q^C(Z)$ and $F_Q^W(Z)$. The Frequency condition is not intended to require verification of these parameters after every 20% increase in power level above the last verification. It only requires verification after a power level is achieved for extended operation that is 20% higher than that power at which $F_Q(Z)$ was last measured.

SR 3.2.1.1

Verification that $F_Q^C(Z)$ is within its specified limits involves increasing $F_Q^M(Z)$ to allow for manufacturing tolerance and measurement uncertainties in order to obtain $F_Q^C(Z)$. Specifically, $F_Q^M(Z)$ is the measured value of $F_Q(Z)$ obtained from core power distribution measurement results and $F_Q^C(Z) = F_Q^M(Z)\ U_{FQ}$ (Ref. 2). The value of U_{FQ} is determined using the formulation provided in the COLR. $F_Q^C(Z)$ is then compared to its specified limits.

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

Performing this Surveillance in MODE 1 prior to exceeding 75% RTP (and meeting the 100% RTP $F_Q(Z)$ limit) provides assurance that the $F_Q^C(Z)$ limit is met when RTP is achieved, because peaking factors generally decrease as power level is increased.

If THERMAL POWER has been increased by ≥ 20% RTP since the last determination of $F_Q^C(Z)$, another evaluation of this factor is required 24 hours after achieving equilibrium conditions at this higher power level to ensure that $F_Q^C(Z)$ values are being reduced sufficiently with power increase to stay within the LCO limits.

The Frequency of 31 EFPD is adequate to monitor the change of power distribution with core burnup because such changes are slow and well controlled when the plant is operated in accordance with the Technical Specifications (TS).

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.2 (continued)

prevent $F_Q(Z)$ from exceeding its limit for any significant period of time without detection. Performing the Surveillance in MODE 1 prior to exceeding 75% RTP or at a reduced power at any other time, and meeting the 100% RTP $F_Q(Z)$ limit, provides assurance that the $F_Q(Z)$ limit will be met when RTP is achieved, because peaking factors are generally decreased as power level is increased.

$F_Q(Z)$ is verified at power levels ≥ 20% RTP above the THERMAL POWER of its last verification, 24 hours after achieving equilibrium conditions to ensure that $F_Q(Z)$ is within its limit at higher power levels.

Insert 1 →

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

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

REFERENCES

1. 10 CFR 50.46, 1974.
2. WCAP-7308-L-P-A, "Evaluation of Nuclear Hot Channel Factor Uncertainties," June 1988.
3. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1 (continued)

After each refueling, $F^N_{\Delta H}$ must be determined in MODE 1 prior to exceeding 75% RTP. This requirement ensures that $F^N_{\Delta H}$ limits are met at the beginning of each fuel cycle. Performing this Surveillance in MODE 1 prior to exceeding 75% RTP, or at a reduced power level at any other time, and meeting the 100% RTP $F^N_{\Delta H}$ limit, provides assurance that the $F^N_{\Delta H}$ limit is met when RTP is achieved, because peaking factors generally decrease as power level is increased.

Insert 1 →

The 31 EFPD Frequency is acceptable because the power distribution changes relatively slowly over this amount of fuel burnup. Accordingly, this Frequency is short enough that the $F^N_{\Delta H}$ limit cannot be exceeded for any significant period of operation.

REFERENCES

1. Regulatory Guide 1.77, Rev. 0, May 1974.
2. 10 CFR 50, Appendix A, GDC 26.
3. 10 CFR 50.46.
4. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES

LCO (continued)	and bottom excore detectors in each detector well. For convenience, this flux difference is converted to provide flux difference units expressed as a percentage and labeled as % Δ flux or % ΔI. The AFD limits are provided in the COLR. The AFD limits for RAOC do not depend on the target flux difference. However, the target AFD may be used to minimize changes in the axial power distribution. Violating this LCO on the AFD could produce unacceptable consequences if a Condition II, III, or IV event occurs while the AFD is outside its specified limits.
APPLICABILITY	The AFD requirements are applicable in MODE 1 greater than or equal to 50% RTP when the combination of THERMAL POWER and core peaking factors are of primary importance in safety analysis. For AFD limits developed using RAOC methodology, the value of the AFD does not affect the limiting accident consequences with THERMAL POWER < 50% RTP and for lower operating power MODES.
ACTIONS	<u>A.1</u> As an alternative to restoring the AFD to within its specified limits, Required Action A.1 requires a THERMAL POWER reduction to < 50% RTP. This places the core in a condition for which the value of the AFD is not important in the applicable safety analyses. A Completion Time of 30 minutes is reasonable, based on operating experience, to reach 50% RTP without challenging plant systems.
SURVEILLANCE REQUIREMENTS	<u>SR 3.2.3.1</u> This Surveillance verifies that the AFD, as indicated by each OPERABLE NIS excore channel, is within its specified limits. The Surveillance Frequency of 7 days is adequate considering that the AFD is monitored by a computer and any deviation from requirements is alarmed.
REFERENCES	1. WCAP-8403 (nonproprietary), "Power Distribution Control and Load Following Procedures," Westinghouse Electric Corporation, September 1974. 2. WCAP-10216-P-A, Revision 1A, Relaxation of Constant Axial Offset Control, F_Q Surveillance Technical Specification, February 1994 (Westinghouse Proprietary). 3. FSAR, Chapter 4.3.2.2.4.

Insert 1

BASES

ACTIONS

A.6 (continued)

Required Action A.6 is modified by a Note that states that the peaking factor surveillances must be completed when the excore detectors have been normalized to restore QPTR to within limit (i.e., Required Action A.5). The intent of this Note is to have the peaking factor surveillances performed at operating power levels, which are only required if the excore detectors were normalized to restore QPTR to within limit per Required Action A.5.

B.1

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

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1

SR 3.2.4.1 is modified by two Notes. Note 1 allows QPTR to be calculated with three power range channels if THERMAL POWER is ≤ 75% RTP and the input from one Power Range Neutron Flux channel is inoperable. Note 2 allows performance of SR 3.2.4.2 in lieu of SR 3.2.4.1.

Input from a Power Range Neutron Flux channel is considered to be operable if the upper and lower detector currents are obtainable. The remaining portion of the channel (the electronics required to provide the channel input to the QPTR alarm) need not be operable.

This Surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) excore channels, is within its limits. ~~The Frequency of 7 days takes into account other information and alarms available to the operator in the control room.~~ Insert 1 →

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

SR 3.2.4.2

This Surveillance is modified by a Note, which states that it is not required until 12 hours after the input from one or more Power Range Neutron Flux channels is inoperable and the THERMAL POWER is > 75% RTP.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.4.2 (continued)

With an NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. Performing SR 3.2.4.2 at a Frequency of 12 hours provides an accurate alternative means for ensuring that any tilt remains within its limits.

Insert 1 →

For purposes of monitoring the QPTR when one or more power range channels are inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt. The incore detector monitoring is performed with a full incore flux map or two sets of four thimble locations with quarter core symmetry. The two sets of four symmetric thimbles is a set of eight unique detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, and N-8.

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

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

REFERENCES

1. 10 CFR 50.46.
2. Regulatory Guide 1.77, Rev 0, May 1974.
3. 10 CFR 50, Appendix A, GDC 26.
4. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES (continued)

SURVEILLANCE REQUIREMENTS

The SRs for each RTS Function are identified by the SRs column of Table 3.3.1-1 for that Function.

A note has been added to the SR Table stating that Table 3.3.1-1 determines which SRs apply to which RTS Functions.

Note that each channel of process protection supplies both trains of the RTS. When testing Channel I, Train A and Train B must be examined. Similarly, Train A and Train B must be examined when testing Channel II, Channel III, and Channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

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

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

SR 3.3.1.1

Insert 1 →

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

(continued)

Editors note: Consider keeping 2nd sentence of 3.3.1.1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2 (continued)

For example, to assure a reactor trip below the power range high SAL, the Power Range Neutron Flux-High trip Setpoint is reduced as necessary prior to adjusting the power range channel output in the decreasing power direction whenever the calorimetric power is ≥ 15% RTP and <45% RTP. The maximum allowable Power Range Neutron Flux-High trip Setpoint may be increased with increasing RTP in accordance with surveillance procedures. Following a plant refueling outage, it is prudent to reduce the Power Range Neutron Flux–High trip Setpoint prior to startup.

Before the Power Range Neutron Flux–High trip Setpoint is re-set to its nominal full power value (≤109% RTP), the power range channel calibration must be confirmed based on a calorimetric performed at ≥ 45% RTP.

The Note to SR 3.3.1.2 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, but prior to exceeding 30% RTP. A power level of 15% RTP is chosen based on plant stability, i.e., automatic rod control capability and the turbine generator synchronized to the grid. The 24-hour allowance after increasing THERMAL POWER above 15% RTP provides a reasonable time to attain a scheduled power plateau, establish the requisite conditions, perform the required calorimetric measurement, and make any required adjustments in a controlled, orderly manner and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be acceptable for subsequent use.

Insert 1 →

~~The Frequency of every 24 hours is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Together these factors demonstrate that a difference between the calorimetric heat balance calculation and the power range channel output of more than + 2% RTP is not expected in any 24 hour period.~~

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

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output every 31 EFPD. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. The excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%. The comparison checks for differences due to changes in core power distribution since the last calibration.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

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

The Note to SR 3.3.1.3 clarifies that the Surveillance is required only if reactor power is ≥ 50% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 50% RTP. This Note allows power ascensions and associated testing to be conducted in a controlled and orderly manner, at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not be verified to be acceptable for subsequent use. Due to such effects as shadowing from the relatively deep control rod insertion and, to a lesser extent, the dependency of the axially-dependent radial leakage on the power level, the relationship between the incore and excore indications of axial flux difference (AFD) at lower power levels is variable. Thus, it is prudent to defer the calibration of the excore AFD against the incore AFD until more stable conditions are attained (i.e., withdrawn control rods and higher power level). The AFD is used as an input to the Overtemperature ΔT reactor trip function and for assessing compliance with ITS LCO 3.2.3, "AXIAL FLUX DIFFERENCE." Due to the DNB benefits gained by administratively restricting the power level to 50% RTP, no limits on AFD are imposed below 50% RTP by LCO 3.2.3; thus, the proposed change is consistent with LCO 3.2.3. requirements below 50% RTP. Similarly, sufficient DNB margins are realized through operation below 50% RTP that the intended function of the Overtemperature ΔT reactor trip function is maintained, even though the excore AFD indication may not exactly match the incore AFD indication. Based on plant operating experience, 24 hours is a reasonable time frame to limit operation above 50% RTP while completing the procedural steps associated with the surveillance in an orderly manner.

Insert 1 →

~~The Frequency of every 31 EFPD is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Also, since the changes in neutron flux are slow during the fuel cycle, the expected change in the absolute difference between the incore and excore AFD will be less than 3 percent AFD during this interval.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.4

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

The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip Function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.14. The bypass breaker test shall include a local manual shunt trip only. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service.

Insert 1 → ~~The Frequency of every 62 days on a STAGGERED TEST BASIS is justified in Reference 29.~~

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. ~~The seismic trip is tested every 92 days on a STAGGERED TEST BASIS.~~ The SSPS is tested ~~every 92 days on a STAGGERED TEST BASIS,~~ using the semiautomatic tester. The train being tested is placed in the bypass condition with the RTB bypass breaker installed, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function including operation of the P-7 permissive which is a logic function only. The P-7 alarm circuit is excluded from this testing since it only mimics the actions of the SSPS and cannot prevent the permissive from performing its function.

Insert 1 → ~~The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 29.~~

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to the incore channels. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the incore power distribution measurements. The incore power distribution measurements can be obtained using the movable incore detectors or an OPERABLE Power Distribution Monitoring System (PDMS) (Reference 26). If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the overtemperature ΔT Function.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.6 (continued)

A Note modifies SR 3.3.1.6. The Note states that this Surveillance is required only if reactor power is ≥ 75% RTP and that 72 hours after thermal power is ≥ 75% RTP is allowed for performing the first surveillance after reaching 75% RTP. The SR is deferred until a scheduled testing plateau above 75% RTP is attained during the post-outage power ascension. During a typical post-refueling power ascension, it is usually necessary to control the axial flux difference at lower power levels through control rod insertion. After equilibrium conditions are achieved at the specified power plateau, a power distribution measurement must be taken and the required data collected. The data is typically analyzed and the appropriate excore calibrations completed within 48 hours after achieving equilibrium conditions. An additional time allowance of 24 hours is provided during which the effects of equipment failures may be remedied and any required re-testing may be performed.

The allowance of 72 hours after equilibrium conditions are attained at the testing plateau provides sufficient time to allow power ascensions and associated testing to be conducted in a controlled and orderly manner at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be acceptable for subsequent use.

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

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT every 184 days.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function.

Setpoints must be within the Allowable Values specified in Table 3.3.1-1.

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

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 7. The frequency of 184 days is justified in Reference 29.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

SR 3.3.1.7 is modified by two notes. Note 1 provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3. Note 2 requires that the quarterly COT for the source range instrumentation shall include verification by observation of the associated permissive annunciator window that the P-6 and P-10 interlocks are in their required state for the existing unit conditions. If this surveillance or if SR 3.3.1.8 has been performed within the previous 184 days, the requirements of this surveillance are satisfied.

Insert 1 → ~~The Frequency of 184 days is justified in Reference 29.~~

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7 it is modified by the same Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit conditions by observation of the associated permissive annunciator window. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within 184 days of the Frequencies prior to reactor startup, 12 hours after reducing power below P-10, and four hours after reducing power below P-6, as discussed below. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "12 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency ~~of every 184 days~~ thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup, 12 hours after reducing power below P-10, and four hours after reducing power below P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.8 (continued)

Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 for more than 12 hours or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 12 hour or 4 hour limit, as applicable. These time limits are reasonable, based on operating experience, to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for the periods discussed above. ~~The frequency of 184 days is justified in Reference 29.~~ Insert 1

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT. ~~and is performed every 92 days, as justified in Reference 7.~~ Insert 1

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

SR 3.3.1.10

~~A CHANNEL CALIBRATION is performed every 24 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

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

Whenever an RTD is replaced in Functions 6, 7, or 14, the next required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Insert 1 → ~~The Frequency of 24 months is based on the assumed calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.~~

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10~~, every 24 months~~. The CHANNEL CALIBRATION for the power range nuclear instruments includes a normalization of the detectors based on a power calorimetric and flux map performed above 15% RTP, and a test that shows allowed variances of detector voltage do not effect detector operation. The CHANNEL CALIBRATION for the intermediate range nuclear instruments includes a test that shows allowed variances of detector voltage do not effect detector operation. The CHANNEL CALIBRATION for the source range nuclear instruments includes a periodic test that optimizes detector high voltage and a conditional test for establishing baseline channel settings after maintenance. The baseline test includes obtaining detector high voltage and discriminator bias curves and using this data to evaluate detector and channel settings based on manufacturers' recommendations and industry operating experience.

This SR is modified by three Notes. Note 1 state that neutron detectors are excluded from the CHANNEL CALIBRATION. Note 2 states that the test shall include verification that the time constants are adjusted to the prescribed values where applicable. Note 3 states that, prior to entry into MODE 2 or 1, the power and intermediate range detector plateau voltage verification (as described above) is not required to be current until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 95% RTP. Equilibrium conditions are achieved when the core is sufficiently stable at intended operating conditions to perform a meaningful detector plateau voltage verification. The allowance of 72 hours after equilibrium conditions are attained at the testing plateau provides sufficient time to allow power ascension testing to be conducted in a controlled and orderly manner at conditions that provide acceptable results and without introducing the potential for extended operation at high power levels with instrumentation that has not been verified to be OPERABLE for subsequent use. The source range curves are obtained as required under the conditions that apply during a plant outage.

Insert 1 → The 24 month Frequency is based on past operating experience, which has shown these components usually pass the Surveillance when performed on the 24 month Frequency. The conditions for obtaining the source range curves and for verifying the power and intermediate range detector operation are described above. The other remaining portions of the CHANNEL CALIBRATIONS may be performed either during a plant outage or during plant operation.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.12

SR 3.3.1.12 is the performance of a CHANNEL CALIBRATION of the seismic trip every 24 months. For function 22, Seismic Trip, the calibration shall encompass, as a minimum, the sensor relays, the SSPS, and associated required alarms. Since it is impractical to routinely remove and ship the seismic trigger packages to an offsite facility to verify calibration on a shaker table, the sensors shall be verified by introducing a known acceleration to voltage relationship to the sensor and verifying the proper action, in accordance with the manufacturers recommendations.

Insert 1 →

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

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks every 24 months.

Insert 1 →

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

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip, RCP Breaker Position, Seismic Trip and the SI Input from ESFAS. This TADOT is performed every 24 months. The Manual Reactor Trip test shall independently verify the OPERABILITY of the undervoltage and shunt trip mechanisms for the Reactor Trip Breakers and Reactor Trip Bypass Breakers. Breaker actuation is verified using the local indicator since physical verification of the main contacts is not practical. This is acceptable based on breaker design and industry operating and maintenance experience. The Seismic Trip TADOT shall, as a minimum, verify the OPERABILITY of the channel from the seismic sensor relays to the input logic of the SSPS. The remainder of the channel is tested under the SR 3.3.1.5 or 3.3.1.12 requirements.

Insert 1 →

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

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them except for the Seismic Trip that is calibrated by SR 3.3.1.12 at the same 24 month frequency.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" (Ref. 8) provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time." The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and reverified following maintenance work that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

Insert 1 →

As appropriate, each channel's response time must be verified every 24 months on a STAGGERED TEST BASIS. Each verification shall include at least one train such that both trains are verified at least once per 48 months and one channel per function such that all channels are tested at least once every N times 24 months where N is the total number of redundant channels in a specific RT function. Testing of the final actuation devices is included in the verification. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES

BACKGROUND

Solid State Protection System (continued)

The SLAVE RELAY TEST interval is 24 months. The test frequency is based on relay reliability assessments presented in WCAP-13878, "Reliability Assessment of Potter and Brumfield MDR Series Relays," WCAP-13900, "Extension of Slave Relay Surveillance Test Intervals," and WCAP-14117, "Reliability Assessment of Potter and Brumfield MDR Series Relay." These reliability assessments are relay specific and apply only to Potter and Brumfield MDR series relays which are the only relays used in the ESF actuation system. Note that for normally energized applications, the relays may have to be replaced periodically in accordance with the guidance given in WCAP-13878 for MDR relays.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

Each of the analyzed accidents can be detected by one or more ESFAS Functions. One of the ESFAS Functions is the primary actuation signal for that accident. An ESFAS Function may be the primary actuation signal for more than one type of accident. An ESFAS Function may also be a secondary, or backup, actuation signal for one or more other accidents. Functions such as manual initiation, not specifically credited in the accident safety analysis, are qualitatively credited in the safety analysis and the NRC staff approved licensing basis for the unit. These Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. These Functions may also serve as backups to Functions that were credited in the accident analysis (Ref. 3).

The LCO requires all instrumentation performing an ESFAS Function to be OPERABLE. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions.

The LCO generally requires OPERABILITY of four or three channels in each instrumentation function and two channels in each logic and manual initiation function. The two-out-of-three and the two-out-of-four configurations allow one channel to be tripped, cut-out or bypassed during maintenance or testing without causing an ESFAS initiation. Two logic or manual initiation channels are required to ensure no single random failure disables the ESFAS.

(continued)

BASES (continued)

ACTIONS

P.1 or P.2.1 and P.2.2 (continued)

Placing a second channel in the bypass condition for up to 12 hours for testing purposes is justified in Reference 17. The allowed testing configurations provide flexibility for testing, while assuring that during testing no configuration will cause an inadvertent actuation of the function or keep a valid signal from actuating the function or an associated function as designed. This note is not intended to allow simultaneous testing of coincident channels on a routine basis.

SURVEILLANCE REQUIREMENTS

The SRs for each ESFAS Function are identified by the SRs column of Table 3.3.2-1.

A Note has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS Functions.

Note that each channel of process protection supplies both trains of the ESFAS. When testing channel I, train A and train B must be examined. Similarly, train A and train B must be examined when testing channel II, channel III, and channel IV (if applicable).

The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.2.1

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

Agreement criteria are established in STP I-1A, based on a combination of the channel instrument uncertainties, including indication and reliability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

Insert 1-A

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested every 92 days on a STAGGERED TEST BASIS, using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils. The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 18.

SR 3.3.2.3 - Not used

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The time allowed for the testing (4 hours) is justified in Reference 8. The frequency of 92 days on a STAGGERED TEST BASIS is justified in Reference 18.

SR 3.3.2.5

SR 3.3.2.5 is the performance of a COT.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.1-1.

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

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis (Ref. 8) when applicable.

The Frequency of 184 days is justified in Reference 18.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation MODE is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation MODE is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. ~~This test is performed every 24 months. The Frequency is adequate, based on operating experience, considering relay reliability and operating history data (Ref. 7)~~

Insert 1

SR 3.3.2.7 - Not used

SR 3.3.2.8

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions (except AFW; see SR 3.3.2.13). ~~It is performed every 24 months.~~ Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

Insert 1

SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every 24 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.9 (continued)

Whenever an RTD is replaced in Function 6.d., the next required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Insert 1 →

The Frequency of 24 months is based on the assumption of an 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

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

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. RESPONSE TIME testing acceptance criteria and the individual Functions requiring RESPONSE TIME Verification are included in ECG 38.2. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in both trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

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

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: 1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), 2) inplace, onsite, or offsite (e.g., vendor) test measurements, or 3) utilizing vendor engineering specifications. WCAP-13632-P-A, revision 2, "elimination of Pressure sensor

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.10 (continued)

Response time Testing requirements," dated January 1996, provides the basis and the methodology of using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time." The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and reverified following maintenance work that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

ESF RESPONSE TIME tests are conducted on a 24 month STAGGERED TEST BASIS.

Insert 1

Each verification shall include at least one train such that both trains are verified at least once per 48 months and one channel per function such that all channels are tested at least once every N times 24 months where N is the total number of redundant channels in a specific ESFAS function. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each train. Therefore, staggered testing results in response time verification of one train of devices every 24 months. The 24 month Frequency is consistent with the typical refueling cycle and 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.

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 650 psig in the SGs.

SR 3.3.2.11

Insert 1

SR 3.3.2.11 is the performance of a TADOT as described in SR 3.3.2.8, except that it is performed for the P-4 Reactor Trip Interlock. ~~The 24 month Frequency is based on operating experience.~~

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.12

SR 3.3.2.12 is the performance of an ACTUATION LOGIC TEST. This SR is applied to the RHR Pump Trip on RWST Level-Low actuation logic and relays which are not processed through the SSPS. ~~This test is performed every 24 months. The frequency is adequate based on site and industry operating experience, considering equipment reliability and historical data.~~

Insert 1 →

SR 3.3.2.13

SR 3.3.2.13 is the performance of a TADOT. This test is a check of the Manual Actuation Function for AFW. ~~It is performed every 18 months.~~ Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). ~~The Frequency is adequate, based on industry operating experience.~~ The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

Insert 1 →

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 7.
3. FSAR, Chapter 15.
4. IEEE Std.279-1971.
5. 10 CFR 50.49.
6. Blank
7. WCAP-13900, "Extension of Slave Relay Surveillance Test intervals", April 1994
8. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

(continued)

BASES

ACTIONS

E.1 and E.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.

F.1

Alternate means of monitoring Reactor Vessel Water Level and Containment Area Radiation have been developed. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. Monitoring the Core Exit Thermocouples, Pressurizer Level indication (07-LI-459A, 460A or 461), and RCS Subcooling Monitor indication (07-YI-31) provide an alternate means for RVLIS. These three parameters provide diverse information to verify there is adequate core cooling or RCS inventory. When Containment Area Radiation Level (High Range) monitors (R-30 and R-31) are inoperable, selected portable radiation monitoring equipment is made available for taking correlated readings at the equipment or personnel hatches as the alternate method. If these alternate means are used, the Required Action is not to shut down the unit but rather to follow the directions of Specification 5.6.8, in the Administrative Controls section of the TS. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

SURVEILLANCE REQUIREMENTS

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

SR 3.3.3.1

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1 (continued)

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 sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

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

Insert 1 →

The Frequency of 31 days is based on operating experience that demonstrates that channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.3.2

A CHANNEL CALIBRATION is performed every 24 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter with the necessary range and accuracy. CHANNEL CALIBRATION of the Neutron Flux Wide Range Function excludes the detectors. To ensure that the detectors are verified, the Neutron Flux Wide Range Channels are cross-correlated and normalized to reactor thermal power. CHANNEL CALIBRATION of the Containment Radiation Level (High Range) Function may consist of an electronic calibration of the channel, not including the detector, for range decades above 10R/h and a one point calibration check of the detector below 10 R/h with an installed or portable gamma source. Whenever an RTD is replaced in Functions 3 or 4, the next required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element. Whenever an incore thermocouple is replaced in Function 15, 16, 17, or 18 the next required CHANNEL CALIBRATION of the incore thermocouples is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element. For function 9, Containment Isolation Valve Position, the instrument loop consists of the position switch mounted on the valve, the indication lights in the monitor boxes and the interconnecting wiring. For the CHANNEL CALIBRATION to verify that the channel

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.2 (continued)

responds with the necessary range and accuracy, the test must verify that the proper indication is received when the valve is stroked to the fully closed position. Verification of intermediate position or actual percentage closed is not required, however, for OPERABILITY, the position indication must be able to communicate the proper isolation status of the containment penetration. Adjustments to the channel may be done as part of this surveillance or through other controlled instructions. The Frequency is based on operating experience and consistency with the typical industry refueling cycle.

Insert 1 →

REFERENCES

1. FSAR, 7.5.
2. Regulatory Guide 1.97, Revision 3.
3. NUREG-0737, Supplement 1, "TMI Action Items."
4. Supplemental Safety Evaluation Report 14.
5. Supplemental Safety Evaluation Report 31.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1

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

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when Surveillance is required, the CHANNEL CHECK will verify only 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 CHANNEL CHECK for the RTB serves to verify that the indication correctly indicates the position of the RTB.

Insert 1 →

The Frequency of 31 days is based upon operating experience which demonstrates that channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.4.2

SR 3.3.4.2 verifies each required Remote Shutdown System control circuit and transfer switch performs the intended function. This verification is performed from the hot shutdown panel and locally, as appropriate. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the unit can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations.

Insert 1 →

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. (However, this Surveillance is not

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.2 (continued)

Insert 1 →

required to be performed only during a unit outage.) Operating experience demonstrates that remote shutdown control channels usually pass the Surveillance test when performed at the 24 month Frequency.

SR 3.3.4.3

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

The channel calibration is not applicable to the RTB indication.

Whenever an RTD is replaced in Function 3.a or 3.b, the next required CHANNEL CALIBRATION of the RTDs is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Insert 1 →

The Frequency of 24 months is based upon operating experience and consistency with the typical industry refueling cycle.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 19 (associated with 1967 GDC 11 per FSAR Appendix 3.1A.).

BASES (continued)

APPLICABILITY	The LOP DG Start Instrumentation Functions are required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE so that it can perform its function on an LOP or degraded power to the vital bus.

ACTIONS

In the event a channel's Setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then the function that channel provides must be declared inoperable and the LCO Condition entered for the particular protection function affected.

Because the required channels are specified on a per bus basis, the Condition may be entered separately for each bus as appropriate.

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in the LCO. The Completion Time(s) of the inoperable channel(s) of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1

Condition A applies when one or more of the loss of voltage or the degraded voltage channel functions (this includes both relays and timers) on a single bus are inoperable.

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

A Note is added to allow bypassing one channel for up to 2 hours for surveillance testing. This allowance is made where bypassing the channel does not cause an actuation and where at least one other channel is monitoring that parameter.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1 not used

SR 3.3.5.2

SR 3.3.5.2 is the performance of a TADOT. ~~This test is performed every 18 months.~~ The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. For these tests, the relay Setpoints are verified and adjusted as necessary. ~~The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.3

SR 3.3.5.3 is the performance of a CHANNEL CALIBRATION.

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

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

Insert 1 →

The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. FSAR, Section 8.3.
2. FSAR, Chapter 15.
3. Blank
4. Calculation 174A-DC, "Undervoltage Relay Settings for 4KV System (27HFB2 & 27HFT1)."
5. Calculation 357P-DC, "SLUR and SLUR Timer Setpoints."

BASES (continued)

ACTIONS (continued)

A Note states that Condition C is applicable during movement of recently irradiated fuel assemblies within containment.

SURVEILLANCE REQUIREMENTS

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

SR 3.3.6.1

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

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.

Insert 1 →

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

SR 3.3.6.2

SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 4.

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.3

SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 4.

Insert 1

SR 3.3.6.4

A CFT is performed ~~every 92 days on each~~ on each required channel to ensure the entire channel will perform the intended Function. The Frequency is based on the staff recommendation for increasing the availability of radiation monitors according to NUREG-1366 (Ref. 2). This test verifies the capability of the instrumentation to provide the containment purge and vacuum/pressure relief system isolation.

Insert 1

To ensure complete end-to-end testing through the CVI mode selector switch, the CFT is only valid for the position in use during the test.

SR 3.3.6.5

SR 3.3.6.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every 24 months. The Frequency is acceptable based on instrument reliability and industry operating experience.

Insert 1

SR 3.3.6.6

There is no manual actuation of CVI except via SI, phase A or B. This testing is performed as part of SR 3.3.2.8

SR 3.3.6.7

~~A CHANNEL CALIBRATION is performed every 24 months, or approximately at every refueling.~~ CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.7 (continued)

The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

Insert 1 →

SR 3.3.6.8

This SR assures that the individual channel RESPONSE TIMES for the CVI from Containment Purge Radiation Gaseous and Particulate function are less than or equal to the maximum values assumed in the accident analysis. Response Time testing acceptance criteria are included in ECG 38.2. Individual component response times are not modeled in the analyses. The analyses model the overall or elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in both trains reaches the required functional state (e.g., valves in full closed position). The response time may be measured by a series of overlapping tests such that the entire response time is measured.

Insert 1 →

RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. Each verification shall include at least one train such that both trains are verified at least once per 48 months and one channel per function such that all channels are tested at least once every N times 24 months where N is the total number of redundant channels in a specific ESFAS function. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each train. Therefore, staggered testing results in response time verification of one train of devices every 24 months. The 24 month Frequency is consistent with the typical refueling cycle and 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.

REFERENCES

1. 10 CFR 100.11.
2. NUREG-1366, December 1992.
3. DCM No. T-16, Containment Function.
4. WCAP-15376-P-A, Revision 1, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," March 2003.
5. License Amendment 184/186, January 3, 2006.

BASES

ACTIONS

C.1 and C.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.

D.1 and D.2

Condition D applies when the Required Action and associated Completion Time for Condition A or B have not been met when recently irradiated fuel assemblies are being moved. Movement of recently irradiated fuel assemblies must be suspended immediately to reduce the risk of accidents that would require CRVS actuation.

E.1

Condition E applies when the Required Action and associated Completion Time for Condition A or B have not been met in MODE 5 or 6. Actions must be initiated to restore the inoperable train(s) to OPERABLE status immediately to ensure adequate isolation capability in the event of a waste gas decay tank rupture.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.7-1 determines which SRs apply to which CRVS Actuation Functions.

SR 3.3.7.1

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

Agreement criteria are determined 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.

Insert 1 →

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.2

A CFT is performed once every 92 days on each required radiation monitor to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide the CRVS actuation. The CRVS pressurization system actuation relays are directly actuated by the CRVS atmosphere intake radiation monitors. This signal is not processed through the SSPS, but goes directly to the CRVS actuation relays. The pressurization system is also actuated by Phase A, however, this signal is processed via the SSPS and the testing of the associated relays is performed via SR 3.3.2.2, SR 3.3.2.4, and SR 3.3.2.6. The Frequency is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience.

Insert 1

SR 3.3.7.3

SR 3.3.7.3 is the performance of an ACTUATION LOGIC TEST. This test verifies the signal path to the Master Relay Coil. Although there are no "Master Relays" as in the SSPS, this surveillance was maintained to preserve the format of the standard specification. The surveillance is intended to ensure that the complete logic is tested for the function. Since the radiation monitors directly actuate the actuation relays, this test is performed every 92 days as part of the performance of SR 3.3.7.2.

Insert 1

SR 3.3.7.4

SR 3.3.7.4 is the performance of a MASTER RELAY TEST. This test energizes the Master Relay and verifies the actuation signal injected into the Slave Relays. Although there are no "Master Relays" as in the SSPS, this surveillance was maintained to preserve the format of the standard specification. The surveillance is intended to ensure that the complete logic is tested for the function. Since the radiation monitors directly actuate the actuation relays, this test is performed every 92 days as part of the performance of SR 3.3.7.2.

Insert 1

SR 3.3.7.5

SR 3.3.7.5 is the performance of a SLAVE RELAY TEST. This test energizes the Slave Relays and verifies actuation of the equipment to the pressurization mode. Although there are no "Slave Relays" as in the SSPS, this surveillance was maintained to preserve the format of the standard specification. The surveillance is intended to ensure that the actuation relays, downstream of the logic, function to actuate the pressurization mode equipment. Since the radiation monitors directly actuate the actuation relays, this test is performed every 92 days as part of the performance of SR 3.3.7.2.

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.6

SR 3.3.7.6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions ~~and is performed every 18 months~~. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.).

Insert 1 → The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

SR 3.3.7.7

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

Insert 1 → The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

REFERENCES

1. WCAP-13878, "Reliability of Potter & Brumfield MDR Relays", June 1994.
2. WCAP-13900, "Extension of Slave Relay Surveillance Test Intervals", April 1994.
3. License Amendment 184/186, January 3, 2006.

BASES

ACTIONS (continued)

A.1.1, A.1.2.1, A.1.2.2, and A.1.3

Condition A applies to the radiation monitor functions, and the manual function. Condition A applies to the failure of one or more radiation monitor channels, or a single manual channel. If one or more channels or trains are inoperable, movement of recently irradiated fuel may continue for a period of 30 days. If movement of recently irradiated fuel continues, an appropriate portable continuous monitor with the same setpoint, or an individual qualified in radiation protection procedures with a dose rate monitoring device must be in the spent fuel pool area immediately and, one FBVS train must be placed in the Iodine Removal mode of operation immediately. This effectively accomplishes the actuation instrumentation function and places the area in a conservative mode of operation or provides appropriate monitoring for continued fuel movement.

B.1

Condition B applies when the Required Action and associated Completion Time for Condition A has not been met and recently irradiated fuel assemblies are being moved in the fuel building. Movement of recently irradiated fuel assemblies in the fuel building must be suspended immediately to eliminate the potential for events that could require FBVS actuation.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.8-1 determines which SRs apply to which FBVS Actuation Functions.

SR 3.3.8.1

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

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1 (continued)

Insert 1

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

Keep 2nd sentence

SR 3.3.8.2

A CFT is performed ~~once every 92 days~~ on each required channel to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide the FBACS actuation. The Frequency of 92 days is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience.

Insert 1

SR 3.3.8.3 - Not used

SR 3.3.8.4

SR 3.3.8.4 is the performance of a TADOT. This test is a check of the manual actuation functions ~~and is performed every 18 months~~. Each manual actuation function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (e.g., pump starts, valve cycles, etc.). The Frequency is based on operating experience and is consistent with the typical industry refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

Insert 1

SR 3.3.8.5

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

Insert 1

REFERENCES

1. 10 CFR 100.11.
2. License Amendment 184/186, January 3, 2006.
3. PG&E Letter DCL-05-124

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

Insert 1 →

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

SR 3.4.1.2

Insert 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 RCS average temperature is sufficient to ensure the temperature can be restored to a normal operation, steady state condition following load changes and other expected transient operations. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess for potential degradation and to verify operation is within safety analysis assumptions.

SR 3.4.1.3

Insert 1 →

The 12 hour Surveillance Frequency for the indicated RCS total flow rate is performed using the installed flow instrumentation. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess potential degradation and to verify operation within safety analysis assumptions. The term "indicated RCS total flow" is used to distinguish between the "measured RCS total flow" determined in SR 3.4.1.4.

SR 3.4.1.4

SR 3.4.1.4 has two surveillance requirements, one for the CHANNEL CALIBRATION of the RCS flow indicators and the other for measurement of RCS total flow rate. Measurement of RCS total flow rate by performance of a precision flow calorimetric or by using the cold leg elbow tap methodology ~~once every 24 months~~ allows the installed RCS flow instrumentation to be normalized and verifies the actual RCS flow rate is greater than or equal to the minimum required RCS flow rate.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.4 (continued)

The second part of this surveillance is the routine CHANNEL CALIBRATION of the RCS flow indication instrumentation. The routine calibration of the flow instrumentation ensures that the channels are within the necessary range and accuracy for proper flow indication. ~~The routine CHANNEL CALIBRATION of the RCS flow indication instrumentation is performed every 24 months.~~

Insert 1 →

The Frequency of 24 months for the measurement of RCS total flow rate reflects the importance of verifying flow after a refueling outage when the core has been altered, which may have caused an alteration of flow resistance. Flow verification demonstrates that setpoints are relevant and RCS flow resistance is within limits. The frequency of 24 months for the routine CHANNEL CALIBRATION of the flow indication instrumentation is based on operating experience and consistency with the typical industry refueling cycle.

REFERENCES

1. FSAR, Section 15.
2. Diablo Canyon Power Plant Unit 1 Cycle 9 Reload Safety Evaluation, August 1995.
3. Diablo Canyon Power Plant Unit 2 Cycle 8 Reload Safety Evaluation, Rev.1, April 1996.
4. FSAR, Table 4.1-1.
5. WCAP-15113, Revision 1, "RCS Flow Measurement Using Elbow Tap Methodology at Diablo Canyon Units 1 and 2," April, 2002.

BASES

SURVEILLANCE REQUIREMENTS	SR 3.4.2.1 (continued)
	RCS loop average temperature is required to be verified at or above 541°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 1
REFERENCES	1. FSAR, Chapter 15.

BASES (continued)

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 1

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

This SR is modified by a Note that only requires this SR to be performed during system heatup, cooldown, and ISLH testing. No SR is given for criticality operations because LCO 3.4.2 contains a more restrictive requirement.

REFERENCES

1. Not Used
2. 10 CFR 50, Appendix G.
3. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
4. NRC Generic Letter 96-03, "Relocation of the Pressure Temperature Curves and Low Temperature Overpressure Protection System Limits," January 31, 1996.

BASES

APPLICABILITY (continued)	Operation in other MODES is covered by: LCO 3.4.5, "RCS Loops — MODE 3"; LCO 3.4.6, "RCS Loops — MODE 4"; LCO 3.4.7, "RCS Loops — MODE 5, Loops Filled"; LCO 3.4.8, "RCS Loops — MODE 5, Loops Not Filled"; LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation — High Water Level" (MODE 6); and LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation — Low Water Level" (MODE 6).
ACTIONS	A.1 If the requirements of the LCO are not met, the Required Action is to reduce power and bring the 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~~ that each RCS loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal while maintaining the margin to DNB. ~~The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RCS loop performance.~~ Insert 1
REFERENCES	1. FSAR, Section 15.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

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

Insert 1

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 narrow range water level is ≥ 15% for required RCS loops. If the SG secondary side narrow range water level is < 15%, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink for removal of the decay heat. The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to a loss of SG level.

Insert 1

SR 3.4.5.3

Verification that the required RCPs are OPERABLE ensures that safety analyses limits are met. The requirement also ensures that an additional RCP can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power availability to the required RCPs.

Insert 1

REFERENCES None.

BASES

ACTIONS

A.1 and A.2 (continued)

If one required RHR loop is OPERABLE and in operation and there are no RCS loops OPERABLE, an inoperable RCS loop or RHR loop must be restored to OPERABLE status to provide a redundant means for decay heat removal.

If the parameters that are outside the limits cannot be restored, the unit must be brought to MODE 5 within 24 hours. Bringing the unit to MODE 5 is a conservative action with regard to decay heat removal. With only one RHR loop OPERABLE, redundancy for decay heat removal is lost and, in the event of a loss of the remaining RHR loop, it would be safer to initiate that loss from MODE 5 (≤ 200°F) rather than MODE 4 (> 200°F to < 350°F). The Completion Time of 24 hours is a reasonable time, based on operating experience, to reach MODE 5 from MODE 4 in an orderly manner and without challenging plant systems.

B.1 and B.2

If no loop is OPERABLE or in operation, except during conditions permitted by Note 1 in the LCO section, 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 one RCS or RHR loop to OPERABLE status and operation must be initiated.

Boron dilution requires forced RCS circulation from at least one RCP for proper mixing, so that an inadvertent criticality may be prevented. 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 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 Times reflect the importance of maintaining operation for decay heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

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

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)	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 narrow range water level is ≥ 15%. If the SG secondary side narrow range water level is < 15%, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink necessary for removal of decay heat. The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level. Insert 1 → SR 3.4.6.3 Verification that the required pump is OPERABLE ensures that an additional RCS or RHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience. Insert 1 →
REFERENCES	None.

BASES (continued)

ACTIONS

A.1 and A.2

If one RHR loop is inoperable and the required SGs have secondary side water levels < 15%, redundancy for heat removal is lost. Action must be initiated immediately to restore a second RHR loop to OPERABLE status or to restore the required SG secondary side water levels. Either Required Action A.1 or Required Action A.2 will restore redundant heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no RHR loop is in operation, except during conditions permitted by Notes 1 and 4, or if no 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 one RHR loop to OPERABLE status and operation must be initiated. To prevent inadvertent criticality during a boron dilution, forced circulation from at least one RHR pump is required to provide proper mixing and preserve the margin to criticality 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 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 Times reflect the importance of maintaining operation for heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

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

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.7.2

Verifying that at least two SGs are OPERABLE by ensuring their secondary side narrow range water levels are ≥ 15% ensures an alternate decay heat removal method via natural circulation in the event that the second RHR loop is not OPERABLE. If both RHR loops are OPERABLE, this Surveillance is not needed. The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.

Insert 1

SR 3.4.7.3

Verification that a second RHR pump is OPERABLE ensures that an additional pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the RHR pump. If secondary side water level is ≥ 15% in at least two SGs, this Surveillance is not needed. The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.

Insert 1

REFERENCES

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

2. AR A0582812.

BASES

ACTIONS (continued)

B.1 and B.2

If no required RHR loops are OPERABLE or in operation, except during conditions permitted by Note 1, 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 must be initiated immediately to restore an RHR loop to OPERABLE status and operation. Boron dilution requires forced circulation from at least one RHR pump for proper mixing so that inadvertent criticality can be prevented. 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 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 operation for heat removal. The action to restore must continue until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

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

Insert 1

SR 3.4.8.2

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

Insert 1

REFERENCES

1. AR A0582812.

BASES

ACTIONS (continued)

C.1 and C.2

If one required group of pressurizer heaters is inoperable and cannot be restored in the allowed Completion Time of Required Action B.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 allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

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

Insert 1 →

SR 3.4.9.2

The SR is satisfied when the power supplies are demonstrated to be capable of producing the minimum power and the associated pressurizer heaters are verified to be 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 1 →

SR 3.4.9.3

This SR demonstrates that the heaters can be manually transferred from the normal to the emergency power supply and energized. The Frequency of 24 months is based on a typical fuel cycle and is consistent with similar verifications of emergency power supplies.

Insert 1 →

REFERENCES

1. FSAR, Section 15.
2. NUREG-0737, November 1980.

BASES

ACTIONS (continued)

G.1, G.2 and G.3

If the Required Actions of Condition F are not met, then the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to 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. In MODES 4, 5, and 6 with the reactor vessel head closure bolts not fully de-tensioned, maintaining Class I PORV OPERABILITY is required by LCO 3.4.12.

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

Block valve cycling verifies that the valve(s) can be closed if needed. The basis for the Frequency of 92 days is the ASME OM Code, Subsection ISTC (Ref. 3).

Insert 1 →

The Note modifies this SR by stating that it is not required to be performed with the block valve closed in accordance with the Required Action of this LCO. Opening the block valve in this condition increases the risk of an unisolable leak from the RCS since the PORV is already inoperable.

SR 3.4.11.2

SR 3.4.11.2 requires a complete cycle of each PORV. Operating a PORV through one complete cycle ensures that the PORV can be manually actuated for mitigation of an SGTR. Operating experience has shown that these valves usually pass the surveillance when performed at the required Inservice Testing Program frequency. The frequency is acceptable form a reliability standpoint.

The Note modifies this SR to allow entry into an operation in Mode 3 prior to performing the SR. This allows the surveillance to be performed in MODE 3 or 4.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.11.3

Verifying OPERABILITY of the safety related nitrogen supply for the Class I PORVs may be accomplished by:

a. Isolating and venting the normal air supply, and

b. Verifying that any leakage of the Class I backup nitrogen system is within its limits, and

c. Operating the Class I PORVs through one complete cycle of full travel.

Operating the solenoid nitrogen control valves and check valves on the nitrogen supply system and operating the Class I PORVs through one complete cycle of full travel ensures the nitrogen backup supply for the Class I PORV operates properly when called upon. The Frequency of 24 months is based on a typical refueling cycle and the Frequency of the other Surveillances used to demonstrate Class I PORV OPERABILITY.

Insert 1

SR 3.4.11.4

Insert 1

Performance of a COT is required on each required Class I PORV to verify and, as necessary, adjust its lift setpoint. PORV actuation could depressurize the RCS and is not required.

SR 3.4.11.5

Insert 1

Performance of a CHANNEL CALIBRATION on each required Class I PORV actuation channel is required ~~every 24 months~~ to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

REFERENCES

1. Not Used.
2. FSAR, Section 15.2.
3. ASME, Code for Operation and Maintenance of Nuclear Power Plants, 2001 Edition including 2002 and 2003 Addenda.
4. Generic Letter 90-06, "Resolution of Generic Issue 70, 'Power-Operated Relief Valve and Block Valve Reliability,' and generic issue 94, 'Additional Low-Temperature Overpressure Protection for Light-Water Reactors,' Pursuant to 10 CFR 50.54(f)," June 25, 1990.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of zero SI pumps and one ECCS CCP are verified capable of injecting into the RCS and the accumulator discharge isolation valves are verified closed and their breakers open. Verification that each accumulator is isolated is only required when accumulator isolation is required as stated in Note 1 to the LCO. Further, CCP-3 must be realigned for LTOP operation during LTOP conditions.

The SI pumps and one ECCS CCP are rendered incapable of injecting into the RCS for example, through opening the DC knife switch supplying the pumps breaker's control power or removing the power from the pumps by racking the breakers out under administrative control or by isolating the discharge of the pump by closed isolation valves with power removed from the operators or by a manual isolation valve secured in the closed position.

An alternate method of providing low temperature overpressure protection may be employed to prevent a pump start that could result in an injection into the RCS. An inoperable pump may be energized for test or for accumulator fill provided the discharge of the pump is isolated from the RCS by closed isolation valve(s) with power removed from the valve operator(s), or by manual isolation valve(s) sealed in the closed position. ~~The Frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.~~

Insert 1 →

SR 3.4.12.4

Not Used

SR 3.4.12.5

The RCS vent of ≥ 2.07 square inches is proven OPERABLE by verifying its open condition. ~~either:~~

Insert 1 →

~~a. Once every 12 hours for a valve that is not locked, sealed, or secured in the open position.~~

~~b. Once every 31 days for other vent paths (e.g., a valve that is locked, sealed, or otherwise secured in the open position.) A removed pressurizer safety valve or open manway also fits this category.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.5 (continued)

Any passive vent path arrangement need only be open when required to be OPERABLE. This Surveillance is required to be performed if the vent is being used to satisfy the pressure relief requirements of LCO 3.4.12.b.

SR 3.4.12.6

The Class I PORV block valve must be verified open every 72 hours to provide the flow path for each required Class I PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This surveillance is performed if the PORV satisfies the LCO.

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

Insert 1

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

SR 3.4.12.7

Not Used

SR 3.4.12.8

The SR Note states that the SR is not required to be performed until 12 hours after decreasing any RCS cold leg temperature to ≤ LTOP arming temperature specified in the PTLR.

Insert 1

The SR may be performed prior to reaching ≤ LTOP arming temperature and must be current (within 31 days) to meet this surveillance requirement. If not performed prior to reaching LTOP temperature, the test must be performed within 12 hours after entering the LTOP MODES. The 12 hour allowance considers the unlikelihood of a low temperature overpressure event during this time.

Following the initial SR, while remaining in the Applicable LTOP MODE, the SR will be performed ~~every 31 days~~ thereafter on each required Class I PORV to verify and, as necessary, adjust its lift setpoint. The COT will verify the setpoint is within the PTLR allowed limits in the PTLR. PORV actuation could depressurize the RCS and is not required.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)	SR 3.4.12.9
Insert 1	Performance of a CHANNEL CALIBRATION on each required Class I PORV actuation channel is required ~~every 24 months~~ to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.
REFERENCES	1. 10 CFR 50, Appendix G. 2. Generic Letter 88-11. 3. Not Used 4. FSAR, Chapter 5. 5. 10 CFR 50, Section 50.46. 6. 10 CFR 50, Appendix K. 7. Generic Letter 90-06. 8. Not Used 9. ASME Code Case N-514. 10. AR A0625429 11. AR A0589860

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

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

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

Insert 1 → The 72 hour Frequency is a reasonable interval to trend LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents. The 12 hour Frequency after steady state operation has been achieved provides for those situations following a transient such that the 72 hours plus extension allowed by SR 3.0.2 would be exceeded. Under these circumstances, the SR would be due within 12 hours after steady state operation has been reestablished ~~and every 72 hours thereafter during steady state operation~~.

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 8. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

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

Insert 1 → 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. 8).

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

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

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

Insert 1

Testing is to be performed every 24 months, a typical refueling cycle. 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 ASME OM Code, Subsection ISTC (Ref. 7), and is based on the need to perform such surveillances under the conditions that apply during an outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

Test pressures less than 2235 psig but greater than 150 psig are allowed for valves where higher pressures would tend to diminish leakage channel opening. Observed leakage shall be adjusted for actual pressure to 2235 psig assuming the leakage to be directly proportional to pressure differential to the one half power.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1 (continued)

In addition, testing must be performed once after the valve has been opened by flow or exercised to ensure tight reseating. PIVs disturbed in the performance of this Surveillance should also be tested unless documentation shows that an infinite testing loop cannot practically be avoided. Testing must be performed within 24 hours after the valve has been reseated. Within 24 hours is a reasonable and practical time limit for performing this test after opening or reseating a valve. For check valves 8956A-D, evaluation determined that trickle forward flow of 10 gpm or less through these valves would not challenge their seating integrity and therefore do not require testing to ensure tight reseating (Reference9).

The leakage limit is to be met 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 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. In addition, this Surveillance is not required to be performed on the RHR System when the RHR System is aligned to the RCS in the shutdown cooling mode of operation. PIVs contained in the RHR shutdown cooling flow path must be leakage rate tested after RHR is secured and stable unit conditions and the necessary differential pressures are established.

Insert 1 →

Testing is not required for the RHR suction isolation valves more frequently than 24 months as these valves are motor-operated with control room position indication, inadvertent opening interlocks, and system high pressure alarms.

SR 3.4.14.2 and 3.4.14.3

Not Used

(continued)

BASES

ACTIONS

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

analyzed or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information.

The follow-up Required Action is to restore either of the inoperable required monitors to OPERABLE status within 30 days to regain the intended leakage detection diversity. The 30 day Completion Time ensures that the plant will not be operated in a reduced configuration for a lengthy time period.

D.1 and D.2

If a Required Action of Condition A, B, or C, 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 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 all required monitors inoperable, (LCO a, b, and c) no 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 monitors. The check gives reasonable confidence that the channels are operating properly. ~~The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off-normal conditions.~~ Insert 1

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a CHANNEL FUNCTIONAL TEST (CFT) on the required containment atmosphere radioactivity monitors. The test ensures that the monitors can perform their function in the desired manner including alarm functions. ~~The Frequency of 92 days considers instrument reliability, and operating experience has shown that it is proper for detecting degradation.~~ Insert 1

SR 3.4.15.3, SR 3.4.15.4, and SR 3.4.15.5

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. ~~The Frequency of 24 months~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.4.15.3, SR 3.4.15.4, and SR 3.4.15.5 (continued)
Insert 1 →	(except for the required containment atmosphere particulate and gaseous radioactivity monitors which have a frequency of 18 months) is consistent with refueling cycle and considers channel reliability. Again, operating experience has proven that this Frequency is acceptable.

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.
2. Regulatory Guide 1.45.
3. FSAR, Section 5.2.7.
4. NUREG-609, "Asymmetric Blowdown Loads on PWR Primary System," 1981.
5. Generic Letter 84-04, "Safety Evaluation of Westinghouse Topical Reports Dealing with Elimination of Postulated Breaks in PWR Primary Main Loops."
6. FSAR, Section 3.6B.

BASES

ACTIONS (continued)

B.1

With the DOSE EQUIVALENT XE-133 in excess of the allowed limit, DOSE EQUIVALENT XE-133 must be restored to within limits within 48 hours. The allowed Completion Time of 48 hours is acceptable since it is expected that, if there were a noble gas spike, the normal coolant noble gas concentration would be restored within this time period. Also, there is a low probability of a SLB or SGTR occurring during this time period.

A Note permits the use of the provisions of LCO 3.0.4c. This allowance permits entry into the applicable MODE(S), relying on Required Action B.1 while the DOSE EQUIVALENT XE-133 LCO limit is not met. 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.

C.1 and C.2

If the Required Action and the associated Completion Time of Condition A or B is not met, or if the DOSE EQUIVALENT I-131 is > 60.0 μCi/gm, the reactor must be brought to MODE 3 within 6 hours and 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 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the noble gas specific activity of the reactor coolant ~~at least once every 7 days~~. 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 the noble gas 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 7 day Frequency considers the unlikelihood of a gross fuel failure during the time.

Insert 1

If a specific noble gas nuclide listed in the definition of DOSE EQUIVALENT XE-133 in Specification 1.1, "Definitions," is not detected, it should be assumed to be present at the minimum detectable activity.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

The definition of DOSE EQUIVALENT XE-133 in Specification 1.1, "Definitions," requires that the determination of DOSE EQUIVALENT XE-133 shall be performed using the effective dose conversion factors for air submersion listed in Table III.1 of EPA Federal Guidance Report No. 12, 1993, "External Exposure to Radionuclides in Air, Water, and Soil." These dose conversion factors are consistent with the dose conversion factors used in the applicable dose consequence analyses.

The Note modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

SR 3.4.16.2

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

Insert 1

The definition of DOSE EQUIVALENT I-131 in Specification 1.1, "Definitions," specifies the thyroid dose conversion factors which may be used to determine DOSE EQUIVALENT I-131. The thyroid dose conversion factors used to determine DOSE EQUIVALENT I-131 are to be consistent with the dose conversion factors used in the applicable dose consequence analyses, or be conservative with respect to the dose conversion factors used in the applicable dose consequence analyses such that a higher DOSE EQUIVALENT I-131 is determined.

The Note modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

(continued)

BASES

ACTIONS

B.1 (continued)

power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable accumulator to OPERABLE status. The Completion Time minimizes the potential for exposure of the plant to a LOCA under these conditions. The 24 hours allowed to restore an inoperable accumulator to OPERABLE status is justified in WCAP-15049-A, Rev 1. (Ref. 7)

C.1 and C.2

If the accumulator 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 MODE 3 within 6 hours and RCS pressure reduced to ≤ 1000 psig within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1

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

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Each accumulator motor operated isolation valve (8808A, B, C, and D) should be verified to be fully open ~~every 12 hours~~. This verification ensures that the accumulators are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in not meeting accident analyses assumptions. ~~This Frequency is considered reasonable in view of other administrative controls that ensure a mispositioned isolation valve is unlikely.~~

Insert 1 →

SR 3.5.1.2 and SR 3.5.1.3

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

Insert 1 →

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.4

The boron concentration should be verified to be within required limits for each accumulator ~~every 31 days~~ since the static design of the accumulators limits the ways in which the concentration can be changed. ~~The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as in-leakage.~~ Insert 1 Sampling the affected accumulator within 6 hours after a solution volume increase of 5.6% (101 gallon) narrow range indicated level will identify whether in-leakage 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 refueling water storage tank (RWST), and the RWST has not been diluted since verifying that its boron concentration satisfies SR 3.5.4.3, because the water contained in the RWST is nominally within the accumulator boron concentration requirements as verified by SR 3.5.4.3. This is consistent with the recommendation of GL 93-05 (Ref. 4).

SR 3.5.1.5

Verification ~~every 31 days~~ that power is removed from each accumulator isolation valve operator (8808A, B, C, and D) when the RCS pressure is greater than 1000 psig ensures that an active failure could not result in the undetected closure of an accumulator motor operated isolation valve. If this were to occur, only two accumulators would be available for injection given a single failure coincident with a LOCA. ~~Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that power is removed.~~ Insert 1

This SR allows power to be supplied to the motor operated isolation valves when RCS pressure is less than or equal to 1000 psig, thus allowing the valves to be closed to enable plant shutdown without discharging the accumulators into the RCS.

REFERENCES

1. FSAR, Chapter 6.
2. 10 CFR 50.46.
3. FSAR, Chapter 15.
4. GL 93-05, Item 7.1.
5. DCM S-38A.
6. License Amendment 147/147, May 3, 2001.
7. WCAP-15049-A, Rev 1, April, 1999.

BASES

ACTIONS

A.1 (continued)

single OPERABLE ECCS train is not available, the facility is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be immediately entered.

Opening the containment recirculation sump strainer system access ports, or lower plenum drain valve (SI-294) without pipe cap or inlet strainer (STR-440) installed, for Unit 1 or sump screen access hatch on the grating for Unit 2 in MODES 1 through 3 is considered to be a condition which is outside the accident analysis. Therefore, LCO 3.0.3 must be immediately entered (Ref. 9.)

B.1 and B.2

If the inoperable trains 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 MODE 3 within 6 hours and 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.

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Valve position is the concern and not indicated position in the control room. Misalignment of these valves could render both ECCS trains inoperable. Securing these valves in position by removal of power ensures that they cannot change position as a result of an active failure or be inadvertently misaligned. The surveillance can be satisfied using indicated position in the control room but may also be satisfied using local observation. These valves are of the type, described in References 6 and 7, that can disable the function of both ECCS trains and invalidate the accident analyses. A 12 hour Frequency is considered reasonable in view of other administrative controls that will ensure a mispositioned valve is unlikely. As noted in LCO Note 1, both SI pump flow paths may each be isolated for two hours in MODE 3 by closure of one or more of these valves to perform pressure isolation valve testing.

Insert 1

In addition to the valves listed in SR 3.5.2.1, there are other ECCS related valves that must be appropriately positioned. Improper valve position can affect the ECCS performance required to meet the analysis assumptions. These valves are identified in plant documents and are listed in the following table.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.2 (continued)

Insert 1 →

The 31 day Frequency is appropriate because the valves are operated under administrative control, and an improper valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.

SR 3.5.2.3

With the exception of the operating CCP, the ECCS pumps are normally in a standby, nonoperating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. Maintaining the piping from the ECCS pumps to the RCS full of water ensures that the system will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent water hammer, pump cavitation, gas binding, and pumping of non-condensable gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SI signal or during shutdown cooling. The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.

Insert 1 →

The intent of the SR is to assure the ECCS piping is adequately vented. Different means of verification, as alternates to venting the accessible system high points, can be employed to provide this assurance, such as ultrasonic testing the vent lines of the ECCS pump casings and accessible high point vents.

SR 3.5.2.4

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by the ASME Code. (Ref. 8) This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is within the performance assumed in the plant safety analysis. SRs are specified in the applicable portions of the Inservice Testing Program, which encompasses Subsection ISTB of the ASME Code for Operation and Maintenance of Nuclear Power Plants. (Ref. 8). This section of the ASME Code provides the activities and frequencies necessary to satisfy the requirements.

The following ECCS pumps are required to develop the indicated differential pressure when tested on recirculation flow:

CCP ≥ 2400 psid

SI pump ≥ 1455 psid

RHR pump ≥ 165 psid

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.5 and SR 3.5.2.6

These Surveillances demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated SI signal and that each ECCS pump starts on receipt of an actual or simulated SI signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required 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 unplanned plant transients if the Surveillances 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 ESF Actuation System testing, and equipment performance is monitored as part of the Inservice Testing Program.

Insert 1 →

keep this sentence

SR 3.5.2.7

The correct position of throttle/runout valves in the ECCS flow paths is necessary for proper ECCS performance. These manual throttle/runout valves are positioned during flow balancing and have mechanical locks and seals to ensure that the proper positioning for restricted flow to a ruptured cold leg is maintained. The verification of proper position of a throttle/runout valve can be accomplished by confirming the seals have not been altered since the last performance of the flow balance test. Restricting the flow to a ruptured cold leg ensures that the other cold legs receive at least the required minimum flow. The 24 month Frequency is based on the same reasons as those stated in SR 3.5.2.5 and SR 3.5.2.6.

Insert 1 →

SR 3.5.2.8

Periodic inspections of the containment recirculation sump suction inlet ensure that it is unrestricted and stays in proper operating condition. 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 have access to the location, and because of the potential for an unplanned transient if the Surveillance were performed with the reactor at power. This Frequency has been found to be sufficient to detect abnormal degradation and is confirmed by operating experience.

Insert 1 →

Opening the containment recirculation sump strainer system access ports, or lower plenum drain valve (SI-294) without pipe cap or inlet strainer (STR-440) installed, for Unit 1 or sump screen access hatch on the grating for Unit 2 in MODES 1 through 4 is considered to be a condition which is outside the accident analysis. Therefore, LCO 3.0.3 must be immediately entered. (Ref. 9)

BASES

ACTIONS

A.1 (continued)

* The requirement for RWST temperature is to be greater than or equal to the minimum required temperature. The expression "within the required limits", applied to RWST temperature is satisfied when the temperature is greater than or equal to the minimum.

B.1

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

In this Condition, neither the ECCS nor the CS System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the plant in a MODE in which the RWST is not required. The short time limit of 1 hour to restore the RWST to OPERABLE status is based on this condition simultaneously affecting redundant trains and that borated water volume can be restored more rapidly than boron concentration or temperature.

C.1 and C.2

If the RWST 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 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

The RWST borated water temperature should be verified ~~every 24 hours~~ to be above the minimum assumed in the accident analyses. Insert 1 → This Frequency is sufficient to identify a temperature change that would approach the limit and has been shown to be acceptable through operating experience.

The SR is modified by a Note that eliminates the requirement to perform this Surveillance when ambient air temperature is above the minimum temperature for the RWST. With ambient air temperature above the minimum temperature, the RWST temperature should not exceed the limit.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.4.2

The RWST water volume should be verified every 7 days to be above the required minimum level in order to ensure that a sufficient initial supply is available for ECCS injection and CS System pump operation and to support continued ECCS on recirculation. Since the RWST volume is normally stable and the contained volume required is protected by a computer alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

Insert 1

The RWST water volume is administratively maintained at greater than the SR 3.5.4.2 limit in accordance with STP R-20.

SR 3.5.4.3

The boron concentration of the RWST should be verified every 7 days to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.

Insert 1

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.
2. Surveillance Test Procedure R-20, "Boric Acid Inventory."

BASES

ACTIONS (continued)

B.1 and B.2

When the Required Actions cannot be completed within the required Completion Time, a controlled shutdown must be initiated. The Completion Time of 6 hours for reaching MODE 3 from MODE 1 is a reasonable time for a controlled shutdown, based on operating experience and normal cooldown rates, and does not challenge plant safety systems or operators. Continuing the plant shutdown begun in Required Action B.1, an additional 6 hours is a reasonable time, based on operating experience and normal cooldown rates, to reach MODE 4, where this LCO is no longer applicable.

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1

Verification ~~every 31 days~~ that the manual seal injection throttle valves are adjusted to give a hydraulic resistance within the limit ensures proper manual seal injection throttle valve position, and hence, proper seal injection flow, is maintained. The Frequency of 31 days is based on engineering judgment and is consistent with other ECCS valve Surveillance Frequencies. The Frequency has proven to be acceptable through operating experience.

Insert 1 →

The seal water injection filters can affect the system flow. As differential pressure across the filter increases over the life of the filter element, certain operating adjustments may be made to maintain the RCP seal flow within the allowed limits. The effect on the system flow resulting from valving in a clean standby filter, after having adjusted the system over time, could result in a resistance flow value outside the TS limit. Therefore, instructions are provided that when a filter is removed from or returned to service, that the procedure to ensure flow characteristics of the seal injection water flow path satisfy the accident analysis and TS may need to be performed.

As noted, the Surveillance is to be completed within 4 hours after the RCS (pressurizer) pressure has stabilized within the specified pressure limits at nominal operating pressure. The RCS (pressurizer) pressure requirement is specified since this configuration will produce the required pressure conditions necessary to assure that the manual valves are set correctly. The exception is limited to 4 hours to ensure that the Surveillance is timely.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.
2. 10 CFR 50.46.
3. License Amendment 148/148, May 7, 2001.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Containment Leakage Rate Testing Program. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria were established during initial air lock and containment OPERABILITY testing. The periodic testing requirements verify that the 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 conditions that apply during a plant outage, and the potential for loss of containment OPERABILITY if the Surveillance were performed with the reactor at power the 24 month frequency for the interlock is justified based on generic operating experience. The 24 month Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during use of the airlock.

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.2 (continued)

environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day Frequency is consistent with other containment isolation valve requirements discussed in SR 3.6.3.3.

Insert 1

SR 3.6.3.3

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 of the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, which may include the use of local or remote indicators, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. The SR specifies that containment isolation valves that are open under administrative controls are not required to meet the SR during the time the valves are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in a closed position since these were verified to be in the correct position upon locking, sealing, or securing.

Insert 1

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

SR 3.6.3.4

This SR requires verification that each containment isolation manual valve and blind flange 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 of 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.4 (continued)

administrative controls and the probability of their misalignment is low. The SR specifies that containment isolation valves that are 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 a closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

This 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 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 their proper position, is small.

SR 3.6.3.5

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

SR 3.6.3.6

Not Used

SR 3.6.3.7

Containment Purge supply and exhaust, and Containment Pressure/Vacuum Relief valves with resilient seals, are leakage rate tested beyond the test requirements of 10 CFR 50, Appendix J, Option B to ensure OPERABILITY. Industry operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining these penetrations leak tight (due to the direct path between containment and the environment), a Frequency of 184 days was established as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" (Ref. 4). Since then, the reliability of these valves has improved with very low incidence of leakage exceeding the allowable administrative limits. This allows extending the leakage test frequency to 24 months.

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.7 (continued)

Additionally, this SR must be performed within 92 days after opening the containment purge supply and exhaust valves. The 92 day Frequency was chosen recognizing that cycling these valves could introduce additional seal degradation (beyond that occurring to a valve that has not been opened). Thus, decreasing the interval (from 24 months) is a prudent measure after a valve has been opened. Because of proven reliability of the containment vacuum/pressure relief valves, no leakage testing is required after they are opened.

A Note is added to clarify that Leakage Rate testing is not required for containment purge valves with resilient seals when their penetration flow path is isolated by a leak tested blank flange.

SR 3.6.3.8

Automatic containment isolation valves close on a containment isolation (Phase A, Phase B, or CVI) signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic valve will actuate to its isolation position on a containment isolation signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 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 1

SR 3.6.3.9

Not Used

SR 3.6.3.10

Verifying that each 12 inch containment pressure/vacuum relief valve is blocked to restrict opening to ≤ 50° is required to ensure that the valves can close under DBA conditions within the times assumed in the analyses of References 1 and 2. If a LOCA occurs, the containment pressure/vacuum relief valves must close to maintain containment leakage within the values assumed in the accident analysis. The 24 month Frequency is appropriate because the blocking devices are not typically removed except during maintenance.

Insert 1

SR 3.6.3.11

Not Used

BASES (continued)

SURVEILLANCE REQUIREMENTS	SR 3.6.4.1 Verifying that containment pressure is within limits ensures that unit operation remains within the limits assumed in the containment analysis. The 12 hour Frequency of this SR was developed based on operating experience related to trending of containment pressure variations during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment pressure condition.
	Insert 1 →
REFERENCES	1. FSAR, Section 6.2. 2. 10 CFR 50, Appendix K.

BASES (continued)

ACTIONS

A.1

When containment average air temperature is not within the limit of the LCO, it must be restored to within limit 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 four temperature measurements. The four temperature measurement locations are pre-selected from:

a. TE-85 or TE-86, approximately 100 ft elevation between crane wall and containment wall,

b. TE-87 or TE-88, approximately 100 ft elevation between steam generators,

c. TE-89 or TE-90, approximately 140 ft elevation near equipment hatch or stairs at 270°, respectively,

d. TE-91 or TE-92, approximately 184 ft elevation on top of steam generator missile barriers away from steam generators.

Insert 1 →

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.

(continued)

BASES (continued)

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. The containment spray flow path consists of the direct flow path from the fluid source (e.g., RWST) to the supplied safety-related component (e.g., spray headers) and portions of any branch line flow path off the direct flow path that a valve misposition could result in degradation of the system safety function. 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 which are closed and secured by a cap or blind flange (e.g., manual test, vent, and drain valves), to valves that cannot be inadvertently misaligned (e.g., check valves), or to valves in instrument or sample lines. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, which may include the use of local or remove indicators, that those valves outside containment (only check valves are inside containment) and capable of potentially being mispositioned are in the correct position.

Insert 1

SR 3.6.6.2

Operating each required CFCU for ≥ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day Frequency was developed considering the known reliability of the fan units and controls, the two train redundancy available, and the low probability of significant degradation of the CFCUs occurring between surveillances. It has also been shown to be acceptable through operating experience.

Insert 1

SR 3.6.6.3

Verifying that each required CFCU is receiving the required component cooling water flow of ≥ 1650 gpm provides assurance that the design flow rate assumed in the safety analyses will be achieved (Ref. 4). The component cooling water (CCW) system is hydraulically balanced during normal operation to ensure that at least 1650 gpm is delivered to each CFCU during a design bases event (DBA). The hydraulic system balance considers normal system alignments and the potential for any single active failure.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.3 (continued)

Operation of the CFCUs is permitted with lower CCW flow to the CFCUs during ASME Section XI testing or decay heat removal in MODE 4 with the residual heat removal heat exchangers in service. To support this conclusion, a calculation was performed to evaluate containment heat removal with one train of containment spray OPERABLE and reduced CCW flow to three CFCUs. The calculation concluded that this configuration would provide adequate heat removal to ensure that the maximum design pressure of containment was not exceeded during a DBA in MODE 1. This analysis also determined that a single failure could not be tolerated during this condition and still assure that the maximum design pressure of containment would not be exceeded. (Ref. 6)

Insert 1 →

The Frequency was developed considering the known reliability of the Cooling Water System, the two train redundancy available, and the low probability of a significant degradation of flow occurring between surveillances.

SR 3.6.6.4

Verifying each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head (205 psid) 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 O&M Code (Ref. 5). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. During refueling operation, a containment spray pump can be aligned to take suction from the refueling water storage tank (RWST) and discharge into the residual heat removal system discharge line back to the RWST. Flow using this lineup can achieve full design flow of 2600 gpm. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by abnormal performance. The Frequency of the SR is in accordance with the Inservice Testing Program.

SR 3.6.6.5 and SR 3.6.6.6

These SRs require verification that each automatic containment spray valve actuates to its correct position and that each containment spray pump starts upon receipt of an actual or simulated actuation of a containment high-high pressure signal with a coincident "S" signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

Insert 1 →

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.7

This SR requires verification that each CFCU actuates upon receipt of an actual or simulated safety injection signal. The 24 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience. See SR 3.6.6.5 and SR 3.6.6.6, above, for further discussion of the basis for the 24 month Frequency.

Insert 1

SR 3.6.6.8

With the containment spray inlet valves closed and the spray header drained of any solution, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, a test at 10 year intervals is considered adequate to detect obstruction of the nozzles.

Insert 1

SR 3.6.6.9

The CFCUs are designed to start or restart in low speed upon receipt of an SI signal. This SR ensures that this feature is functioning properly. The 31 day frequency is selected based upon the normal operation of the CFCUs in high speed during power operation.

Insert 1

REFERENCES

1. FSAR, Appendix 3.1A
2. 10 CFR 50, Appendix K.
3. FSAR, Section 6.2.1.
4. FSAR, Section 6.2.2.
5. ASME Code for Operation and Maintenance of Nuclear Power Plants, 2001 Edition including 2002 and 2003 Addenda.
6. License Amendment 89/88, April 16, 1996.
7. Calculation STA-075, "Minimum ECCS Flow and Minimum Recirculation Spray Flow During the Sump Recirculation Phases."

BASES (continued)

ACTIONS

A.1

If the Spray Additive System is inoperable, it must be restored to OPERABLE within 72 hours. The pH adjustment of the Containment Spray System flow for corrosion protection and iodine removal enhancement is reduced in this condition. The Containment Spray System would still be available and would remove some iodine from the containment atmosphere in the event of a DBA. The 72 hour Completion Time takes into account the redundant flow path capabilities and the low probability of the worst case DBA occurring during this period.

B.1 and B.2

If the Spray Additive System cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. The extended interval to reach MODE 5 allows 48 hours for restoration of the Spray Additive System in MODE 3 and 36 hours to reach MODE 5. This is reasonable when considering the reduced pressure and temperature conditions in MODE 3 for the release of radioactive material from the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1

Verifying the correct alignment of Spray Additive System manual, power operated, and automatic valves in the spray additive flow path provides assurance that the system is able to provide additive to the Containment Spray System in the event of a DBA. The spray additive flow path consists of the direct flow path from the fluid source (e.g., spray additive tank) to the supplied safety-related component (e.g., spray headers) and portions of any branch line flow path off the direct flow path that a valve misposition could result in degradation of the system safety function. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves which are closed and secured by a cap or blind flange (e.g., manual test, vent, and drain valves), to valves that cannot be inadvertently misaligned (e.g., check valves), or to valves in instrument or sample lines. This SR does not require any testing or valve manipulation. Rather, it involves verification through a system walkdown, which may include the use of local or remote indicators, that those valves outside containment and capable of potentially being mispositioned are in the correct position.

Insert 1-2

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.7.2

To provide effective iodine removal, the containment spray must be an alkaline solution. Since the RWST contents are normally acidic, the volume of the spray additive tank must provide a sufficient volume of spray additive to adjust pH for all water injected. This SR is performed to verify the availability of sufficient NaOH solution in the Spray Additive System. The required volume may be surveilled using an indicated level band of 50 to 88% for the Spray Additive Tank which corresponds to the LCO 3.6.7 minimum and maximum limits adjusted conservatively for instrument accuracy of ± 3%. The 184 day Frequency was developed based on the low probability of an undetected change in tank volume occurring during the SR interval (the tank is isolated during normal unit operations). Tank level is also indicated and equipped with a low level alarm in the control room, so that there is high confidence that a level below an acceptable value would be detected.

Insert 1

SR 3.6.7.3

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

Insert 1

SR 3.6.7.4

This SR provides verification that each automatic valve in the Spray Additive System flow path actuates to its correct position on a containment spray actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required 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 was concluded to be acceptable from a reliability standpoint.

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)	SR 3.6.7.5 To ensure correct operation of the Spray Additive System, flow from the spray additive tank to the eductors is verified ~~once every 5 years~~. This SR is performed by verifying that the solution flow path is not blocked from the spray additive tank through test valve 8993, from the RWST through test valve 8993 for each of the two flow paths, and from the RWST to the eductors. This SR provides assurance that NaOH will be metered into the flow path upon Containment Spray System initiation. ~~Due to the passive nature of the spray additive flow controls, the 5 year Frequency is sufficient to identify component degradation that may affect flow rate.~~ Insert 1 →
REFERENCES	1. FSAR, Chapter 6.2.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1 (continued)

analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power.

As the MSIVs are not tested at power, they are exempt from the ASME Code, Section XI (Ref. 5), requirements during operation in MODE 1 or 2.

The Frequency is in accordance with the Inservice Testing Program.

This test may be conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. However, the test is normally conducted in MODE 5 as permitted by the cold shutdown frequency justification provided in the Inservice Testing Program (IST) and as permitted by Reference 6, Subsection ISTC-3521(c).

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 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 1

REFERENCES

1. FSAR, Section 10.3.
2. FSAR, Section 6, Appendix 6.2 C.
3. FSAR, Section 15.4.2.
4. 10 CFR 100.11.
5. ASME, Boiler and Pressure Vessel Code, Section XI.
6. ASME Code for Operation and Maintenance of Nuclear Power Plants, 2001 Edition including 2002 and 2003 Addenda.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 and SR 3.7.3.2

These SRs verify that the closure time of each MFIV is ≤ 60 seconds and that each MFRV, and MFRV bypass valves is ≤ 7 seconds, not including the instrument delays. The MFIV and MFRV and MFRV bypass valve closure times are assumed in the accident and containment analyses. These Surveillances are normally performed upon returning the unit to operation following a refueling outage. These valves should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power. This is consistent with the ASME Code (Ref. 2) stroke requirements during operation in MODES 1 and 2.

The Frequency for these SRs is in accordance with the Inservice Testing Program.

SR 3.7.3.3

This SR verifies that each MFIV, MFRV, MFRV bypass valve, and MFWP turbine stop valve 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 MFIV, MFRV, MFRV bypass valve, and MFWP turbine stop valve testing is every 24 months. The 24 month Frequency is based on the refueling cycle. Operating experience has shown that these components are reliable and can be expected to pass the Surveillance when performed at the 24 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.

Insert 1

SR 3.7.3.4

This SR verifies that the closure time of each MFWP turbine stop valve is ≤ 1 second, not including the instrument delays. The MFWP turbine stop valve closure times are assumed in the accident and containment analyses. These surveillances are normally performed on returning the unit to operation following a refueling outage. The Frequency is the same as that for the MFRVs and the MFRV bypass valves. Preventive/predictive maintenance related to the MFWP turbine stop valves, and actions initiated in response to control oil cleanliness problems, shall be performed to ensure reliability of MFWP trip function.

REFERENCES

1. FSAR, Section 10.4.7.
2. ASME Code for Operation and Maintenance of Nuclear Power Plants, 2001 Edition including 2002 and 2003 Addenda.

BASES (continued)

SURVEILLANCE REQUIREMENTS

Plant procedures which provide a 31 day verification that the 10% ADV manual block valves are open assures that the valves have not been inadvertently closed.

SR 3.7.4.1

To perform a controlled cooldown of the RCS, the ADVs must be able to be opened and closed remotely using the remote manual controls and the backup air bottles. This SR ensures that the ADVs are tested through a full control cycle at least once per fuel cycle. Performance of inservice testing or use of an ADV during a unit cooldown may satisfy this requirement. Operating experience has shown that these components are expected to pass the Surveillance when performed at the 24 month Frequency. The Frequency is acceptable from a reliability standpoint.

Insert 1

SR 3.7.4.2

The function of the block valve is to isolate a failed open ADV. Cycling the block valve both closed and open demonstrates its capability to perform this function. Performance of inservice testing or use of the block valve during unit cooldown may satisfy this requirement. Operating experience has shown that these components are expected to pass the Surveillance when performed at the specified frequency. The Frequency is acceptable from a reliability standpoint.

Stet Insert 1 no change

SR 3.7.4.3

The function of the back-up air bottles is to assure that the ADVs will be able to be opened as required to perform a controlled cooldown of the RCS in the event of a loss of the normal air supply system. The backup air bottle system was specifically installed to allow the RCS to be cooled for a SGTR coincident with a loss of offsite power. Verification of the bottle pressure ~~once every 24 hours~~ allows for timely bottle replacement and trending for leaks.

Insert 1

REFERENCES

1. FSAR, Section 15.
2. WCAP-11723
3. DCM S-25B, S-3B, AND S-4.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths provides assurance that the proper flow paths will exist for AFW operation. The AFW System flow paths consist of the direct flow paths from the fluid source (e.g., CST, steam generators) to the supplied safety-related components (e.g., steam generator, turbine driven AFW pump) and portions of any branch line flow path off a direct flow path that a valve misposition could result in degradation of the system safety function. 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 are closed and secured by a cap or blind flange (e.g., manual test, vent, and drain valves), to valves that cannot be inadvertently misaligned (e.g., check valves), or to valves in instrument or sample lines. 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.

Insert 1 → The 31 day Frequency, based on engineering judgment, is consistent with procedural controls governing valve operation, and ensures correct valve positions.

The valves in the flowpath from the CST to the AFW pump suction are verified to be in the correct position prior to use of the AFW system for normal startup, and are subsequently controlled by a sealed valve checklist. Use of AFW for normal startups and shutdowns, and performance of the quarterly pump surveillance tests confirms that the CST flowpath to the AFW pump suction is properly aligned.

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 centrifugal pump performance required by the ASME OM Code (Ref 2). The ASME OM Code requires a comprehensive pump test on each AFW pump every two years. The comprehensive pump test is required to be performed at +/- 20% of pump design flow. This test confirms one point on the pump design curve and is indicative of overall performance. In addition to the comprehensive pump test, the ASME OM Code also requires a less comprehensive test to be performed at 3-month intervals for each pump. These tests are performed at recirculation flow so as to limit thermal shocking of AFW/FW piping nozzles. The ability of steam traps 104, 105, and 106 to remove condensate in the steam supplies is verified during the inservice testing of the pumps. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.2 (continued)

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

SR 3.7.5.3

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation generated by an auxiliary feedwater actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required 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 acceptable based on operating experience and the design reliability of the equipment.

Insert 1 →

This SR is modified by a Note that states the SR is not required in MODE 4 when the steam generator is being relied upon for heat removal. In MODE 4, the required AFW train may already be aligned and operating.

SR 3.7.5.4

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation generated by an auxiliary feedwater actuation signal in MODES 1, 2, and 3. In MODE 4, the required pump is already operating and the autostart function is not required. 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.

Insert 1 →

This SR is modified by two Notes. Note 1 indicates that the SR for the turbine-driven pump can be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test. Note 2 states that the SR is not required in MODE 4. In MODE 4, the required motor-driven pump is already operating and the autostart function is not required. In MODE 4, the heat removal requirements would be less providing more time for operator action to manually start the required AFW pump.

SR 3.7.5.5

Not Used.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.6

This SR verifies that the FWST is capable of being aligned to the AFW pump suctions. This assures that this additional supply of required AFW is available from the seismically qualified FWST should it be needed for a natural circulation cooldown.

Since there is insufficient volume in the CST alone for long-term cooling needs, the NRC required in SSER 8 that the FWST have a seismically-qualified flow path to the AFW Pumps suction to withstand an assumed seismic failure of any single valve (valve jammed shut). This means that valves MU-0-1557 and MU-1-297 and MU-2-298 should be maintained in their normal positions. If these valves are required to be out of position due to maintenance activities, then these activities should be treated as if entering the LCO action for TS 3.7.6.

Insert 1 → The 24 month frequency, based on engineering judgement, is consistent with References 2 and 4.

A similar SR is not required for the CST alignment since the AFW system is used for startup and an AFW pump is tested each month. This operation and the pump tests assure proper valve alignment.

REFERENCES

1. FSAR, Section 6.5 and Section 15.2.8.
2. ASME Code for Operation and Maintenance of Nuclear Power Plants, 2001 Edition including 2002 and 2003 Addenda.
3. DCM S-3B.
4. 10 CFR 50.55a(b)(3)(vi).

BASES

ACTIONS (continued)	B.1 and B.2 If the CST or FWST cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4, without reliance on the steam generator for heat removal, within 18 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 3.7.6.1 This SR verifies that the CST contains the required volume of cooling water. The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the CST inventory between checks. Also, the 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms, to alert the operator to abnormal deviations in the CST levels. Insert 1 → SR 3.7.6.2 This SR verifies that the FWST contain the required volume of cooling water. The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the FWST inventory between checks. Also, the 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms, to alert the operator to abnormal deviations in the FWST levels. Insert 1 →
REFERENCES	1. FSAR, Section 9.2.6 and 9.5.1. 2. FSAR, Chapter 6. 3. FSAR, Chapter 15. 4. DCM S-3B.

BASES

ACTIONS (continued)

B.1 and B.2

If the vital CCW 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 3.7.7.1

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. A possible exception to this note, is isolation of CCW to the CFCUs. Isolation of CCW to the CFCUs could potentially affect the flow balance and requires evaluation to ensure continued operability.

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. The CCW flow path consists of the direct flow path servicing the safety related equipment (e.g., ECCS pump coolers, CFCUs, RHR heat exchanger) and portions of any branch line flow path off the direct flow path that a valve misposition could result in degradation of the system safety function. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves which are closed and secured by a cap or blind flange (e.g., manual test, vent, and drain valves), to valves that cannot be inadvertently misaligned (e.g., check valves), or to valves in instrument or sample lines. 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.

Insert 1 → The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.7.2

This SR verifies proper automatic operation of the CCW valves on an actual or simulated Phase A or Phase B containment isolation actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. Insert 1 → 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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.2 (continued)

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.

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated safety injection or loss of offsite power (4kV auto transfer) 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 with the reactor at power. This surveillance requirement applies to the SIS auto-start and the 4kV auto-transfer automatic starts only. 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 1 →

REFERENCES

1. FSAR, Section 9.2.2.
2. FSAR, Section 6.2.
3. WCAP-14282, Revision 1, "Evaluation of Peak CCW Temperature Scenarios for Diablo Canyon Units 1 and 2," dated December 1997.

BASES (continued)

ACTIONS

A.1

If one ASW train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE ASW train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ASW train could result in loss of ASW system function. The Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops-MODE 4," should be entered if an inoperable ASW train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

B.1 and B.2

If the ASW train cannot be restored to OPERABLE status within the associated Completion Times, 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 and power operated valves in the ASW system flow path provides assurance that the proper flow paths exist for ASW system operation. The ASW system flow path consists of the direct flow path servicing the safety related equipment (e.g., CCW heat exchanger) and portions of any branch line flow path off the direct flow path that a valve misposition could result in degradation of the system safety function. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR also does not apply to valves which are closed and secured by a cap or blind flange (e.g., manual test, vent, and drain valves), to valves that cannot be inadvertently misaligned (e.g., check valves), or to valves in instrument or sample lines. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

Insert 1 →

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.2

This SR verifies proper remote manual full stroke operation of the ASW valves. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 92 day Frequency is based on the IST program frequency and is consistent with the ASME O&M Code testing requirements, and ensures the ability to correctly align the valves. Operating experience has shown that these components usually pass the Surveillance when performed at the 92 day Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

Insert 1 — Stet No change

SR 3.7.8.3

This SR verifies proper automatic operation of the ASW pumps on an actual or simulated safety related actuation signal. The ASW 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. This surveillance requirement applies to the SIS auto-start and the 4kV auto transfer automatic starts only. 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 1

REFERENCES

1. FSAR, Section 9.2.7.
2. FSAR, Section 6.2.
3. NRC Generic Letter 91-13, "Request for Information Related to the Resolution of Generic Issue 130, 'Essential Service Water System Failures at Multi-unit Sites,' Pursuant to 10 CFR 50.54 (F)," dated September 19, 1991.

BASES

ACTIONS (continued)

E.1

In MODE 5 or 6, or during movement of recently irradiated fuel assemblies, with two CRVS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

F.1

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

SURVEILLANCE REQUIREMENTS

Once actuated due to a fuel handling accident the CRVS must be protected against a single failure. This protection, although not required for immediate accident response, is assured by requiring that a backup power supply be provided as described above in Applicability. This back up is assured via the performance of surveillances that verify the ability to transfer power supplies.

The 31 day procedural verification of the separate vital power supplies for the redundant fans assures system reliability.

SR 3.7.10.1

Standby systems should be checked periodically for ≥ 15 minutes to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month, by initiating, from the control room, flow through the HEPA filter and charcoal adsorber using either redundant set of booster and pressurization supply fans, provides an adequate check of this system. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability.

Insert 1

SR 3.7.10.2

This SR assures that the emergency power alignment is appropriate for the operating conditions of the plant. With the power supply options available it is appropriate to verify that the redundant fans for each train are aligned to receive power from separate OPERABLE vital buses.

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.10.3

This SR verifies that the required CRVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CRVS filter tests are in accordance with ANSI N510-1980 (Ref. 3). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.10.4

This SR verifies that each CRVS train automatically starts and operates in the pressurization mode on an actual or simulated actuation signal generated from a Phase "A" Isolation. The Frequency of 24 months is based upon the maintenance and operating history (Ref. 6).

Insert 1

SR 3.7.10.5

This SR verifies the integrity of the control room enclosure, and the assumed inleakage rates of the potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the CRVS. During the pressurization mode of operation, the CRVS is designed to pressurize the control room ≥ 0.125 inches water gauge positive pressure with respect to the outside atmosphere in order to prevent unfiltered inleakage. The CRVS is designed to maintain this positive pressure with one train. The Frequency of 24 months on a STAGGERED TEST BASIS is based upon the maintenance and operating history (Ref. 6).

Insert 1

REFERENCES

1. FSAR, Section 9.4.1.
2. FSAR, Chapter 15.
3. ANSI N510-1980.
4. NUREG-0800, Section 6.4, Rev. 2, July 1981.
5. DCM S-23F.
6. License Amendment 119/117, April 14, 1997.
7. License Amendment 184/186, January 3, 2006.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Each ABVS train should be checked periodically to ensure that it functions properly. As the environment and normal operating conditions on this system are not severe, testing each train with flow through both the HEPA filter and charcoal adsorber bank once a month provides an adequate check on this system. Both ABVS trains shall be operated long enough (≥ 15 minutes) to verify all components are operating correctly. Monthly verification of the separate OPERABLE vital power supplies for the exhaust fans assures system redundancy. The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

Insert 1 →

SR 3.7.12.2

This SR verifies that the required ABVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The ABVS filter tests are in accordance with References 3 and 4. The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.12.3

The SR is modified by a Note, which limits the applicability of this SR when the ABVS is already in its safety function configuration and is verified to be capable of providing that function. The intent of this change is only to address this specific condition and the SR is considered applicable and must be met whenever the ABVS is not in that configuration.

This SR verifies that each ABVS train actuates on an actual or simulated actuation signal by verifying that the exhaust fan starts and the associated dampers align to exhaust through the common HEPA filter and charcoal adsorber (Ref. 3 and 4). The 24 month Frequency is based upon the maintenance and operating history (Ref. 8).

Insert 1 →

SR 3.7.12.4

Not Used.

SR 3.7.12.5

Not Used.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.6

This SR verifies the leak tightness of dampers that isolate flow to the normally operating filter train. This SR assures that the flow from the auxiliary building passes through the HEPA filter and charcoal adsorber unit when the ABVS Buildings and Safeguards or Safeguards Only modes have been actuated ~~coincident with an SI.~~ The 24 month Frequency is based upon the maintenance and operating history (Ref. 8).

Insert 1

REFERENCES

1. FSAR, Section 9.4.2.
2. FSAR, Section 15.5.
3. ASTM D 3803-1989
4. ANSI N510-1980
5. 10 CFR 100.11.
6. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.
7. DCM S-23B, "Main Auxiliary Building Heating and Ventilation System".
8. ~~License Amendment 119/117, April 14, 1997.~~

BASES

ACTIONS (continued)

C.1

When two trains of the FHBVS are inoperable during movement of recently irradiated fuel assemblies in the fuel handling building, suspend movement of recently irradiated fuel assemblies in the fuel handling building. This does not preclude the movement of fuel assemblies to a safe position.

SURVEILLANCE REQUIREMENTS

Once actuated due to a fuel handling accident the FHBVS must be protected against a single failure coincident with a loss of offsite power. Protection against a loss of power, although not required for immediate accident response, is assured by requiring that a backup power supply be provided as described above in the LCO section. This back up is assured via the performance of non-TS surveillances.

SR 3.7.13.1

Standby systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system. This testing requires establishing air flow through both the HEPA filters and charcoal adsorbers.

Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.

Insert 1

SR 3.7.13.2

This SR verifies that the required FHBVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The FHBVS filter tests are in accordance with References 5 and 6. The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.13.3

This SR verifies that each FHBVS train starts and operates on an actual or simulated actuation signal and directs its exhaust flow through the HEPA Filters and charcoal adsorber banks. ~~The 24 month Frequency is consistent with Reference 9.~~

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.4

This SR verifies the integrity of the fuel handling building enclosure. The ability of the fuel handling building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the FHBVS. During the post accident mode of operation, the FHBVS is designed to maintain a slight negative pressure in the fuel handling building, to prevent unfiltered LEAKAGE. The FHBVS is designed to maintain the building pressure ≤ -0.125 inches water gauge with respect to atmospheric pressure. The 24 month Frequency (on a STAGGERED TEST BASIS) is based upon the maintenance and operating history (Ref. 9).

Insert 1

SR 3.7.13.5

Operation of damper M-29 is necessary to ensure that the system functions properly. The operability of damper M-29 is verified if it can be closed. ~~The 24 month Frequency is consistent with Reference 9.~~

Insert 1

REFERENCES

1. FSAR, Section 9.4.4.
2. FSAR, Section 15.5.
3. Regulatory Guide 1.25.
4. 10 CFR 100.
5. ASTM D 3802-1989
6. ANSI N510-1980.
7. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.
8. DCM S-23D, "Fuel handling Building HVAC System."
9. ~~9.~~ a. ~~License Amendment 119/117, April 14, 1997.~~ a. Not Used
10. License Amendment 184/186, January 3, 2006.
11. PG&E Letter DCL-05-124

BASES (continued)

APPLICABILITY	This LCO applies during movement of irradiated fuel assemblies in the spent fuel pool, since the potential for a release of fission products exists.
ACTIONS	A.1 Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply. When the initial conditions for prevention of an accident cannot be met, steps should be taken to preclude the accident from occurring. When the spent fuel pool water level is lower than the required level, the movement of irradiated fuel assembly in the spent fuel pool is immediately suspended. This does not preclude movement of a fuel assembly to a safe position. 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, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.
SURVEILLANCE REQUIREMENTS	SR 3.7.15.1 This SR is done during the movement of irradiated fuel assemblies as stated in the Applicability. This SR verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the spent fuel pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by plant procedures and are acceptable based on operating experience. Insert 1 → During refueling operations, the level in the spent fuel pool is in equilibrium with the refueling canal, and the level in the refueling canal is checked daily in accordance with SR 3.9.7.1.
REFERENCES	1. FSAR, Section 9.1.2. 2. FSAR, Section 9.1.3. 3. FSAR, Section 9.1.4.3.4, 15.4.5 and 15.5.22. 4. Regulatory Guide 1.25, Rev. 0. 5. 10 CFR 100.11.

BASES (continued)

ACTIONS

A.1 and A.2

The Required Actions are modified by a Note indicating that LCO 3.0.3 does not apply.

When the concentration of boron in the spent fuel storage pool is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This is most efficiently achieved by immediately suspending the movement of fuel assemblies and immediately taking actions to restore the spent fuel pool boron concentration to greater than or equal to 2000 ppm. This suspension of fuel movement does not preclude movement of fuel assemblies to a safe position.

If the LCO is not met while moving fuel assemblies LCO 3.0.3 would not be applicable since the inability to suspend movement of fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies by chemical analysis that the concentration of boron in the spent fuel pool is at or above the required limit. As long as this SR is met, the analyzed accidents are fully addressed. The 7 day Frequency is appropriate because no major replenishment of pool water is expected to take place.

Insert 1

REFERENCES

1. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).
2. Not used.
3. "Criticality Safety Evaluation of Region 2 of the Diablo Canyon Spent Fuel Storage Racks with 5.0 % Enrichment," S.E.Turner, October 1993, Holtec Report HI-931077.
4. FSAR, Section 9.1, 15.4.5, and 15.5.22.
5. "Diablo Canyon Units 1 and 2 Spent Fuel Criticality Analysis," February 14, 2001, Paul F. O'Donnell, Westinghouse Doc. No. A-DP1-FE-0001.
6. "Diablo Canyon Units 1 and 2 Spent Fuel Boron Dilution Analysis," January, 2001, Gary J. Corpora
7. License Amendment 154/154, September 25, 2002.
8. "Spent Fuel Storage Expansion at Diablo Canyon Units 1 & 2 for Pacific Gas & Electric Co.", October 2004, Holtec Report HI-2043162.
9. License Amendment 183/185, November 21, 2005.

BASES

ACTIONS	A.1 and A.2 (continued) 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 3.7.18.1 This SR verifies that the secondary specific activity is within the limits of the accident analysis. A gamma isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the validity of the safety analysis assumptions as to the source terms in post accident releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. ~~The 31 day Frequency is based on the detection of increasing trends of the level of DOSE EQUIVALENT I-131, and allows for appropriate action to be taken to maintain levels below the LCO limit.~~ Insert 1
REFERENCES	1. 10 CFR 100.11. 2. FSAR, Chapter 15.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3785 V is consistent with the second level undervoltage relay allowable values. This is the minimum steady state voltage needed on the 4160 volt vital buses to ensure adequate 4160 volt, 480 volt and 120 volt levels. The specified maximum steady state output voltage of 4400 V is equal to the maximum operating voltage for 4000 V motors specified in ANSI C84.1. The maximum steady state output voltage of 4400 V ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 Rev. 2 (Ref. 16).

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 1 →

SR 3.8.1.2 and SR 3.8.1.7

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

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 2 for SR 3.8.1.2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and, for SR 3.8.1.2, followed by a warmup period prior to loading.

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGS are started from standby conditions. Standby conditions for a DG means that the diesel engine coolant and oil temperature is being maintained consistent with manufacturer recommendations of equal to or greater than 90°F but less than 175°F. For the purposes of this SR, the diesel generator start will be initiated using one of the following signals: 1) manual, 2) simulated loss of offsite power, and 3) safety injection actuation test signal.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

SR 3.8.1.7 requires that~~, at a 184 day Frequency,~~ the DG starts from standby conditions and achieves required speed within 10 seconds and required voltage and frequency within 13 seconds. The 10 second start requirement reflects the point during the DG's acceleration at which the DG is assumed to be able to accept load. The 13 second start requirement reflects the point at which the DG is assumed to have reached stable operation. These stability points represent the recovery of the DG and the power distribution system following a transient. This assures the ability of the system to undergo further transients. Actual steady state operation is expected to achieve a level of stability closer to the nominal 60 Hz value. The 10 and 13 second start requirements support the assumptions of the design basis LOCA analysis in the FSAR, Chapter 15 (Ref. 5).

Since SR 3.8.1.7 requires a timed start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

Insert 1

~~The 31 day Frequency for SR 3.8.1.2 is consistent with Generic Letter 94-01 (Ref. 12). The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 7). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.~~

SR 3.8.1.3

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

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The load band is provided to avoid routine overloading of the DG. OPERATION within the load range of 90% to 100% of rated full load without anomalies will provide adequate assurance of the machine's ability to carry 100% of rated full load if required.

Insert 1

~~The 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 Rev. 3 (Ref. 15).~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.3 (continued)

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. Similarly, momentary power factor transients above the limit do not invalidate the test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time per unit in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is a contained quantity sufficient for DG operation at full load for a nominal one-hour period. One hour is adequate time for an operator to take corrective action to restore the fuel oil supply to the affected day tank. The level is expressed as an equivalent volume in gallons.

Insert 1 → The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since the transfer pumps auto-starts are at a level above the minimum contained volume. Therefore, normal DG operation will not result in day tank level below the minimum required volume. Additional assurance of sufficient day tank contained volume is provided by a low level alarm.

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day tanks ~~once every 31 days~~ eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. Insert 1 → The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. 10). This SR is for preventative maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during the performance of this Surveillance.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from the fuel oil storage tanks to each day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and that controls are configured such that each unit will preferentially receive fuel from a different storage tank while using the other unit's preferred storage as its backup storage.

Insert 1 →

The Frequency ~~of 31 days is~~ adequate to verify proper operation of the fuel oil transfer pumps and day tank supply valves to maintain the required volume of fuel oil in the day tanks. The frequency has been proven acceptable through operating experience.

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit, which is the immediate access 230 kV, demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. Transfer of each 4.16 kV ESF bus power supply from the alternate offsite circuit (immediate access 230 kV) to the delayed access circuit (500 kV circuit) demonstrates the ability of the delayed access circuit. 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 1 →

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR for automatic bus transfers could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. The restriction applies only to automatic bus transfers where a unit trip and reactor trip will occur.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.8 (continued)

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 independenty 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. This restriction does not apply to manual bus transfers which are a normal action required during a plant startup or shutdown.

Preplanned maintenance that would require the performance of this SR to demonstrate operability following the maintenance shall only be performed in Modes 3, 4, 5, or 6.

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. The single largest DG load is a centrifugal charging pump (CCP), which is rated at 600 hp. The CCP has a maximum demand, based on the maximum expected horsepower input and motor efficiency, of 515 kW. This Surveillance may be accomplished by:

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

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

c. Simultaneously tripping a combination of loads equal to or greater than the DG's associated single largest post-accident load with the DG solely supplying the bus.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 Rev. 2 (Ref. 16) recommendations for response during load sequence intervals. The 2.4 seconds specified is equal to 60% of a typical 4 second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The 24 month Frequency is consistent with the intent of Regulatory Guide 1.108 (Ref. 9). DC 3.8-ED1: added "in that the SR is performed on a Refueling Outage Frequency."

Insert 1

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 independenty 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.

Preplanned maintenance that would require the performance of this SR to demonstrate operability following the maintenance shall only be performed in Modes 3, 4, 5, or 6.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, Note 2 requires that, if synchronized to offsite power, testing must be performed using a power factor ≤ 0.9 lagging. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

SR 3.8.1.10

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

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, testing must be performed using a power factor ≤ 0.87 lagging. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

Insert 1 →

The 24 month Frequency is consistent with the intent of Regulatory Guide 1.108 (Ref. 9) and is intended to be consistent with expected fuel cycle lengths.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.11

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis accident. The 10 second requirement reflects the assumption of the accident analysis that the DG has reached the point in its acceleration where the DG is able to accept load. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved. After energization of the loads, steady state voltage and frequency are required to be within their limits.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. The permanently connected loads are the Class 1E 480 VAC buses. The permanently connected loads do not receive a load shed signal. In addition, the containment fan cooler units do not receive a load shed signal but are de-energized when their motor contactors drop out on undervoltage. The permanently connected loads are re-energized when the DG breaker closes to energize the bus. The auto-connected loads are those loads that are energized via their respective sequencing timer. In certain circumstances, many of these loads cannot 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 DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert 1 →

The Frequency of 24 months is consistent with the intent of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

The requirement to verify the connection of permanent and autoconnected loads to the immediate access 230 kV offsite power system is intended to satisfactorily show the relationship of these loads to the DG loading logic. For a description of the permanent and auto-connected loads, see SR 3.8.1.11 Bases. In certain circumstances, many of these loads cannot 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 DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert 1 →

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

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGS during testing. For the purpose of this testing, the DGS must be started from standby conditions, that is, with the engine coolant and oil temperature maintained consistent with manufacturer recommendations of equal to or greater than 90°F but less than 175°F. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance 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 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 or 2. Risk insights or deterministic methods may be used for this assessment.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

Preplanned maintenance that would require the performance of this SR to demonstrate operability following the maintenance shall only be performed in Modes 3, 4, 5, or 6.

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions are bypassed when the diesel engine trip cutout switch is in the cutout position and the DG is aligned for automatic operation. The noncritical trips include directional power, loss of field, breaker overcurrent, high jacket water temperature, and diesel overcrank. These noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

Insert 1 →

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 was concluded to be acceptable from a reliability standpoint.

SR 3.8.1.14

The refueling outage intent of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), requires demonstration ~~once per 24 months~~ that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ 2 hours of which is at a load equivalent to 110% of the continuous duty rating and the remainder of the time at a load equivalent to the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.14 (continued)

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor of ≤ 0.87 lagging. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

Insert 1 →

The 24 month Frequency is consistent with the intent of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by Note 1 which 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.

Administrative controls for performing this SR in MODES 1 or 2, with the DG parelleled to an offsite power supply, ensure or require that:

a. Weather conditions are conducive to performing this SR.

b. The offiste power supply and switchyard conditions support performing this SR, including communicating with the transmission group responsible for the 230 kV and 500 kV switchyards to ensure that, during the DG testing, vehicle access to these switchyards is controlled and no elective maintenance or testing on the offsite power sources is performed potentially affecting:

- 230 kV and 500 kV systems (Exceptions are to be authorized by Operations Management)
- Either units' 12 kV startup bus
- Transformers or insulators

c. No equipment or systems assumed to be available for supporting the performance of the SR are removed from service.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve stability by reaching the required voltage and frequency within 13 seconds. The 13 second time is derived from the requirements of the accident analysis to respond to a design basis accident. The acceptance criteria represents the recovery of the DG and the power distribution system following a start and load transient. This assures the ability of the system to undergo further transients. Actual steady state operation is expected to achieve a level of stability closer to the nominal 60 Hz value. The 24 month Frequency is consistent with the intent of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(5).

Insert 1

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

SR 3.8.1.16

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an auto close signal on bus undervoltage, and the load sequencing timers are reset.

Insert 1

The Frequency of 24 months is consistent with the intent of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), and takes into consideration unit conditions required to perform the Surveillance.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.16 (continued)

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

Preplanned maintenance that would require the performance of this SR to demonstrate operability following the maintenance shall only be performed in Modes 5 or 6.

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing. A Safety Injection signal, received while the DG is operating in a test mode, results in the auxiliary breaker opening and the emergency loads automatically sequencing onto the DG.

In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable.

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

Insert 1 →

The 24 month Frequency is consistent with the intent of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(8), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.17 (continued)

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 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 or 2. Risk insights or deterministic methods may be used for this assessment.

Preplanned maintenance that would require the performance of this SR to demonstrate operability following the maintenance shall only be performed in Modes 5 or 6.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

Under accident and loss of offsite power conditions, loads are sequentially connected to the bus by load sequencer timers. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The load sequence time interval tolerances ensure that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. The timing limits for the load sequence timers are found in table B3.8.1-1 (ESF Timers) and table B3.8.1-2 (Auto transfer Timers).

With an ESF timer found to be outside the range of acceptable settings, the corresponding DG shall be declared inoperable in MODES 1, 2, 3, and 4, and the corresponding CONDITION followed. With an Auto Transfer timer found to be outside the range of acceptable settings, the corresponding DG shall be declared inoperable for all MODES. This action is necessary only for that time required to open the breaker on the affected load.

Insert 1 →

The Frequency of 24 months is consistent with the intent of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(2), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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

Preplanned maintenance that would require the performance of this SR to demonstrate operability following the maintenance shall only be performed in Modes 5 or 6.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.19

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

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with a Safety Injection signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert 1 →

~~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.~~

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil temperature maintained consistent with manufacturer recommendations for DGs of equal to or greater than 90°F but less than 175°F. The reason for Note 2 is that the performance of 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 or 2 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 or 2. Risk insights or deterministic methods may be used for this assessment.

Preplanned maintenance that would require the performance of this SR to demonstrate operability following the maintenance shall only be performed in Modes 5 or 6.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.20

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

Insert 1 →

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9).

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil temperature maintained consistent with manufacturer recommendations of equal to or greater than 90°F but less than 175°F.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Chapter 8.
3. Regulatory Guide 1.9, Rev. 0, March 10, 1971 (Safety Guide 9).
4. FSAR, Chapter 6.
5. FSAR, Chapter 15.
6. Regulatory Guide 1.93, Rev. 0, December 1974.
7. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
8. 10 CFR 50, Appendix A, GDC 18.
9. Regulatory Guide 1.108, Rev. 1, August 1977.
10. Regulatory Guide 1.137, Rev. 1, Oct 1979.
11. ASME, Boiler and Pressure Vessel Code, Section XI.
12. Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," May 31, 1994.
13. Diesel Generator Allowed Outage Time Study, LA 44/43, October 4, 1989
14. License Amendment 44/43, October 4, 1989.
15. Regulatory Guide 1.9 Rev. 3, July 1993.
16. Regulatory Guide 1.9 Rev. 2, December 1979.
17. License Amendment 166/167, April 20, 2004.18. Calculation PRA 02-06, "Diesel Generator LAR for 14-day AOT."
19. License Amendment 174/176, September 28, 2004.

BASES

ACTIONS

F.1 (continued)

adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the turbo air assist 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 DG inoperable. This period is acceptable based on the remaining capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

G.1

With a Required Action and associated Completion Time or Conditions E or F not met, or one or more DG's starting air, or turbocharger air assist subsystem not within limits for reasons other than addressed by Conditions E or F, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

H.1, H.2, and H.3

With a Required Action and associated Completion Time not met, or the fuel oil storage tanks not within limits for reasons other than addressed by Conditions A, B, C, or D, the fuel oil storage tanks may be incapable of supporting the DGs in performing their intended function. This condition requires declaring inoperable, all the DGs on the unit(s) associated with either the inadequate fuel oil inventory, the fuel storage tank(s) having particulate outside the limit, and/or the fuel storage tank(s) having properties outside limits; and shutting down to MODE 3 in 6 hours and MODE 5 in 36 hours any associated unit(s) operating in MODE 1,2,3,or 4.

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 DG operation for 7 days based on a realistic (minimum) ESF systems loading profile. 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.

Insert 1

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

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of operation for each DG at minimum ESF systems loading. The 650 gal requirement is based on the DG

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.2 (continued)

manufacturer consumption values for the run time of the DG at 1% of fuel oil consumption. The storage system used to meet this requirement is that located within the warehouse where 650 gallons of lube oil is stored in drums.

Insert 1 → A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.

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 tanks. The tests, limits, and applicable ASTM Standards are as follows:

a. Sample the new fuel oil in accordance with ASTM D4057-81 (Ref. 6);

b. Verify in accordance with the tests specified in ASTM D975-81 (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.82 and ≤ 0.89 or an API gravity at 60°F of ≥ 27° and ≤ 42°, a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point of ≥ 125°F; and

c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176 or a water and sediment content of ≤ 0.05 volume percent when tested in accordance with ASTM D-1796-83 (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 D975-81 (Ref. 7) are met for new fuel oil when tested in accordance with ASTM D975-81 (Ref. 6), except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 (Ref. 6) or ASTM D2622-82 (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 DG operation. This Surveillance ensures the availability of high quality fuel oil for the DGs.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.3 (continued)

If the analysis of the new fuel oil sample indicates that one or more of the other properties specified in Table 1 of ASTM D975-81 are not within limits, then Required Action D.1 shall be entered, allowing 31 days to restore fuel oil properties to within limits.

Fuel oil degradation during long term storage shows up as an increase in particulates, due mostly to oxidation. The presence of particulates does not mean the fuel oil will not burn properly in a diesel engine. The particulates 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 D2276-78, Method A (Ref. 6). This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. Each tank must be considered and tested separately.

ASTM D 2276-78 was written specifically for aviation fuel. However, it is used in this SR to evaluate diesel fuel oil. Therefore, it may be necessary to perform this test as a modified method. For example, a 500 ml sample may be analyzed rather than a one gallon sample.

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 DG is available. The system design requirements provide for a minimum of three engine start cycles without recharging. Each start cycle is 15 seconds of cranking. The pressure specified in this SR is intended to reflect the lowest value at which three starts can be accomplished.

Insert 1 →

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

SR 3.8.3.5

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.5 (continued)

means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, or 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 1

SR 3.8.3.6

This Surveillance ensures that, without the aid of the refill compressor, sufficient turbocharger air assist air receiver capacity for each DG is available. The system design requirements provide for a minimum of three engine start cycles without recharging. Each start cycle is 15 seconds of cranking. The pressure specified in this SR is intended to reflect the lowest value at which three starts can be accomplished.

Insert 1

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 turbocharger air assist air receiver pressure.

REFERENCES

1. FSAR, Section 9.5.4.2.
2. Regulatory Guide 1.137.
3. ANSI N195-1976, Appendix B.
4. FSAR, Chapter 6.
5. FSAR, Chapter 15.
6. ASTM Standards: D4057-81; D975-81; D4176-82; D1796-83; D1552-79; D2622-82; D2276-78, Method A.
7. ASTM Standards, D975, Table 1.
8. ASME, Boiler and Presser Vessel Code, Section XI.
9. License Amendment 74/73, August 12, 1992.
10. License Amendment 181/183, May 25, 2005.
11. AR A0566159, AR A0512756, AR A0504056

BASES

ACTIONS (continued)

D.1

The design of the 125 VDC electrical power distribution system is such that a battery can have associated with it a dedicated full capacity charger powered from its associated 480 VAC vital bus or a backup full capacity charger powered from another 480 VAC vital bus. Use of the backup full capacity charger results in more than one full capacity charger receiving power simultaneously from a single 480 V vital bus and causes the requirements of independence and redundancy between subsystems to no longer be maintained. Thus, operation with two chargers powered by the same vital bus is limited to 14 days.

E.1 and E.2

If the inoperable DC electrical power subsystem 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

The minimum established float voltage provided by the battery manufacturer is 2.17 Vpc or 130.2 V at the battery terminals for a 60-cell battery. This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). Verifying battery terminal voltage while on float charge for the batteries 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 electrical power subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 8).

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.2

This SR verifies the design capacity of the 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 charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

This SR provides two options. One option requires that each battery charger be capable of supplying 400 amps at the minimum established float voltage for greater than 4 hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least 2 hours.

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest 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.

Insert 1

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.3

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in FSAR Chapter 8, (Ref. 4).

Insert 1 →

The Surveillance Frequency of 24 months is consistent with the intent 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.

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

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

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE Std. 308-1971.
4. FSAR, Chapter 8.
5. FSAR, Chapter 6.
6. FSAR, Chapter 15.
7. Regulatory Guide 1.93, December 1974.
8. IEEE Std. 450-1995.
9. Regulatory Guide 1.32, February 1977.
10. Regulatory Guide 1.129, December 1974.
11. Electrical Design Calculations 235A-DC thru 235F-DC.

BASES (continued)

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. 3). ~~The 7 day Frequency is consistent with IEEE-450 (Ref. 3).~~ Insert 1

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 3.8.6.5

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established float voltage provided by the battery manufacturer, which corresponds to 130.2 V for 60 cells 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 the range of less than 2.13 Vpc, but greater than 2.07 Vpc, are addressed in Specification 5.5.17. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are equal to or greater than the short term absolute minimum voltage of 2.07 V. ~~The Frequency for cell voltage verification every 31 days for pilot cell and 92 days for each connected cell is consistent with IEEE-450 (Ref. 3).~~ Insert 1

SR 3.8.6.3

The electrolyte level minimum established design limit is the manufacturer minimum level indication mark on the battery case. The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. ~~The Frequency is consistent with IEEE-450 (Ref. 3).~~ Insert 1

(continued)

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. 3).

Insert 1

SR 3.8.6.6

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

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

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test. The modified performance discharge test and service test should be performed in accordance with IEEE-450 (Ref. 3).

It may consist of just two rates; for instance the one minute rate published for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test, both of which 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 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.6 (continued)

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 3) and IEEE-485 (Ref. 5). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

Insert 1 → ~~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 service life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 24 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, according to IEEE-450 (Ref. 3), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is < 90% of the manufacturer's rating. The Surveillance Frequency basis is consistent with IEEE-450 (Ref. 3), except if accelerated testing is required, it will be performed at a 24-month frequency to coincide with a refueling outage.

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.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.
3. IEEE Std. 450-1995.
4. FSAR, Chapter 8.
5. IEEE Std. 485-1983.

BASES

ACTIONS

A.1 (continued)

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 and B.2

If the inoperable devices or components 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 inverter. The verification of proper voltage output ensures that the required power is readily available for the instrumentation of the RPS and ESFAS connected to the AC 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 1

REFERENCES

1. FSAR, Chapter 7.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required Class 1E UPS inverters and to continue this action until restoration is accomplished in order to provide the necessary Class 1E UPS inverter power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from a constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage output ensures that the required power is readily available for the instrumentation 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 1

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.
3. License Amendment 184/186, January 3, 2006.

BASES

ACTIONS (continued)	E.1 Condition E corresponds to two required Class 1E AC, DC, or 120 VAC vital buses with inoperable distribution subsystems that result in a loss of safety function, adequate core cooling, containment OPERABILITY and other vital functions for DBA mitigation would be compromised, and immediate plant shutdown in accordance with LCO 3.0.3 is required.
SURVEILLANCE REQUIREMENTS	SR 3.8.9.1 This Surveillance verifies that the required Class 1E AC, DC, and 120 VAC vital bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the redundant capability of the AC, DC, and 120 VAC vital bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions. Insert 1 Table B 3.8.9-1 The table on the next page defines the general features of the AC and DC Electrical Power Distribution System.
REFERENCES	1. FSAR, Chapter 6. 2. FSAR, Chapter 15. 3. Regulatory Guide 1.93, December 1974.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the Class 1E AC, DC, and 120 VAC vital bus electrical power distribution subsystems are functioning properly, with all the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the capability of the electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.

Insert 1 →

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 15.
3. License Amendment 184/186, January 3, 2006.

BASES (continued)

ACTIONS	A.1 and A.2 Continuation of CORE ALTERATIONS or positive reactivity additions (including actions to reduce boron concentration) is contingent upon maintaining the unit in compliance with the LCO. If the boron concentration of any coolant volume in the RCS, and when connected, the refueling canal or the refueling cavity is less than its limit, all operations involving CORE ALTERATIONS or positive reactivity additions must be suspended immediately. Suspension of CORE ALTERATIONS and positive reactivity additions shall not preclude moving a component to a safe position. Operations that individually add limited positive reactivity (e.g., temperature fluctuations, 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.3 In addition to immediately suspending CORE ALTERATIONS and positive reactivity additions, boration to restore the concentration must be initiated immediately. In determining the required combination of boration flow rate and concentration, no unique Design Basis Event 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 actions have been initiated, they 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 that the coolant boron concentration in the filled portions of the RCS, the refueling canal, and the refueling cavity that have direct access to the reactor vessel is within the COLR limits. The boron concentration of the coolant in each required volume is determined periodically by chemical analysis. Insert 1 → A minimum 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.
REFERENCES	1. 10 CFR 50, Appendix A, GDC 26. 2. FSAR, Chapter 15, Section 15.2.4

BASES

ACTIONS

A.1 and A.2 (continued)

The core coupling in this configuration would allow one source range detector to detect significant reactivity changes associated with control rod movement (Ref. 3). Performance of Required Action A.1 shall not preclude completion of movement of a component to a safe position or normal cooldown of a coolant volume for the purpose of system temperature control.

B.1

With no source range neutron flux monitor OPERABLE including no OPERABLE audible alarm and count rate functions, action to restore a monitor to OPERABLE status shall be initiated immediately. Once initiated, action shall be continued until a source range neutron flux monitor including no OPERABLE audible alarm and count rate functions is restored to OPERABLE status.

B.2

With no source range neutron flux monitor OPERABLE, there are no direct means of detecting changes in core reactivity. However, since CORE ALTERATIONS and boron concentration changes inconsistent with Required Action A.2 are not to be made, the core reactivity 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 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 3.9.3.1

SR 3.9.3.1 is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the two indication channels should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions. For core reload, the first CHANNEL CHECK for each channel may be performed using the first fuel assembly as a source, prior to unlatching it in the core.

Insert 1 →

The Frequency of 12 hours is consistent with the CHANNEL CHECK Frequency specified similarly for the same instruments in LCO 3.3.1.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.9.3.2

SR 3.9.3.2 is the performance of a CHANNEL CALIBRATION ~~every 24 months~~. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the normal N31 and N32 source range neutron flux monitors is described in B 3.3.1, "Reactor Trip System (RTS) Instrumentation." The CHANNEL CALIBRATION for the normal N31 and N32 audible alarm and count rate functions includes verification of the control room audible alarm and count rate functions using a simulated signal. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency.

Insert 1

REFERENCES

1. 10 CFR 50, Appendix A, GDC 13, GDC 26, GDC 28, and GDC 29.
2. FSAR , Section 15.2.4.
3. License Amendment 46/45, October 4, 1989.
4. NRC letter, "Diablo Canyon Nuclear Power Plant, Unit Nos.1 and 2 – Technical Specification Bases Change (TAC Nos. M98430 and M98431)," June 9, 1998.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates by inspection or administrative means that each of the containment penetrations is closed or capable of being closed. The Surveillance on the open purge and exhaust valves will demonstrate that the valves are not blocked from closing. Also the Surveillance will demonstrate that each valve operator has motive power, which will ensure that each valve is capable of being closed by an OPERABLE automatic containment purge and exhaust isolation signal.

Insert 1

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. The Surveillance interval is selected to be commensurate with the normal duration of time to complete fuel handling operations. A surveillance before the start of refueling operations will provide two or three surveillance verifications during the applicable period for this LCO. As such, this Surveillance ensures that a postulated fuel handling accident that releases fission product radioactivity within the containment will not result in a release of fission product radioactivity to the environment that exceeds acceptable limits.

SR 3.9.4.2

This Surveillance demonstrates that each containment purge and exhaust valve actuates to its isolation position on manual initiation or on an actual or simulated high radiation signal. The 24 month Frequency maintains consistency with other similar ESFAS instrumentation and valve testing requirements. In LCO 3.3.6, the Containment Purge and Exhaust Isolation instrumentation requires a CHANNEL CHECK every 12 hours and a CFT every 92 days to ensure the channel OPERABILITY during refueling operations. Every 24 months a CHANNEL CALIBRATION is performed. The system actuation response time is demonstrated every 24 months, during refueling, on a STAGGERED TEST BASIS. SR 3.6.3.5 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements. These Surveillances performed during MODE 6 will ensure that the valves are capable of closing after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

Insert 1

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1

This Surveillance demonstrates that the RHR loop is in operation and circulating reactor coolant. The flow rate of 3000 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 prior to 57 hours of core subcriticality. The second part of this Surveillance serves the same function but with 57 hours or more of core subcriticality. The flow rate of 1300 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. Both of these flow rates are points of the same flow rate verses decay heat. The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator in the control room for monitoring the RHR System (Ref. 2).

Insert 1 →

REFERENCES

1. FSAR , Section 5.5.7.
2. License Amendment 28/27, January 5, 1988.

BASES

ACTIONS (continued)

B.3

If no RHR loop is in operation, all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere must be closed within 4 hours. With the RHR loop requirements not met, the potential exists for the coolant to boil and release radioactive gas to the containment atmosphere. Closing containment penetrations that are open to the outside atmosphere ensures that dose limits are not exceeded.

The Completion Time of 4 hours is reasonable at water levels above reduced inventory, based on the low probability of the coolant boiling in that time. At reduced inventory conditions or mid-loop operations, additional actions are taken to provide containment closure in a reduced period of time (Ref. 3). Reduced inventory is defined as less than Elev. 111 ft.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

This Surveillance demonstrates that one RHR loop is in operation and circulating reactor coolant. The flow rate of more than 3000 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 prior to 57 hours subcritical. The second part of this Surveillance serves the same function but with 57 hours or more of core subcriticality and provides a reduced flow rate of 1300 gpm based upon a reduced decay heat load. Both of these flow rates are points of the same flow rate verses decay heat curves. The 1300 gpm limit also precludes exceeding the 1675 gpm upper flow limit to prevent vortexing and air entrainment of the RHR piping system. RHR pump vortexing (failure to meet pump suction requirements) during mid-loop operation may result in RHR pump failure and non-conservative RCS level indication. The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator for monitoring the RHR System in the control room (Ref. 2).

Insert 1

SR 3.9.6.2

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

Insert 1

(continued)

BASES (continued)

APPLICABILITY	LCO 3.9.7 is applicable during CORE ALTERATIONS, except during latching and unlatching of control rod drive shafts, and when moving irradiated fuel assemblies within containment. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel assemblies are not present in containment, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel pool are covered by LCO 3.7.15, "Fuel Storage Pool Water Level."
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 within the containment 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 3.9.7.1 Verification of a minimum water level of 23 ft above the top of the reactor vessel flange ensures that the design basis for the analysis of the postulated fuel handling accident during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a fuel handling accident inside containment (Ref. 2). Insert 1 → ~~The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls of valve positions, which make significant unplanned level changes unlikely.~~
REFERENCES	1. Regulatory Guide 1.25, March 23, 1972. 2. FSAR, Section 15.4.5. 3. NUREG-0800, Section 15.7.4. 4. 10 CFR 100.10. 5. Malinowski, D. D., Bell, M. J., Duhn, E., and Locante, J., WCAP-828, Radiological Consequences of a Fuel Handling Accident, December 1971.

SURVEILLANCE TEST INTERVAL EVALUATION FORMS

Surveillance Test Interval (STI) Evaluation Process

The attached STI evaluation forms were prepared following the guidance in NEI 04-10, Revision 1.

Selection of the Example STIs

The three attached STIs were selected to demonstrate the methodology for Risk Informed TS Initiative 5b.

Input was received from various site organizations, including Engineering, Operations, and Licensing. The following criteria, as listed in NEI 04-10, Revision 1, was considered.

- Safety risk.
- Reactivity management.
- Maintaining dose as low as reasonably achievable (ALARA).
- Burden reduction, including consideration of cost of the test (resources).
- Outage impact (outage work control).
- Work management simplification (on-line work control).
- Production risk.
- Reducing wear and tear on the structure, system, or component.
- Reducing potential for test-caused errors.
- Difficulty of the test and potential for error during the test and its consequence.
- Consideration of the role of the test on the reliability of the associated function.
- Maintenance Rule A1 item that has an associated action plan that necessitates more frequent testing.
- Maintenance Rule and the associated corrective action process that necessitates more frequent testing.

A list of candidate STIs was compiled and grouped into the three categories below related to the DCPP PRA model:

1. PRA Modeled
2. PRA not modeled but could be modeled
3. PRA modeling not practical (qualitative evaluation only).

Figure 1 in NEI 04-10 provides a process flow map for the SFCP. The process includes three different branches to follow depending on how PRA is modeled, as shown in Figure 1 below in steps 8, 9, and 10:

Three process paths are identified on the marked up figure below as Path (1), Path (2), and Path (3).

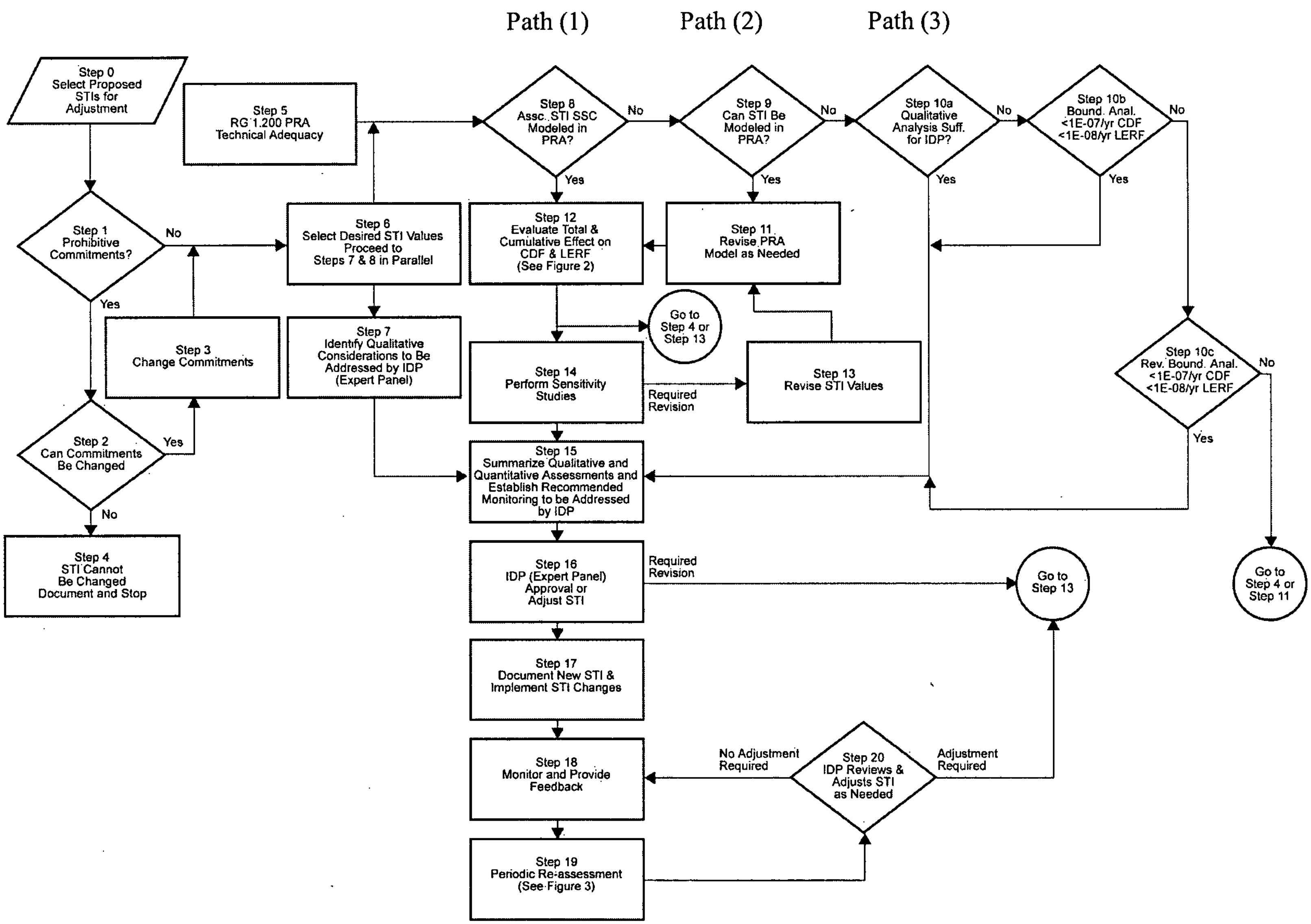

Figure 1. Surveillance Frequency Control Program Change Process

The surveillances selected to demonstrate the functionality of the three process paths are:

- TS SR 3.3.5.2 – Diesel Generator Trip Actuating Device Operational Test (Path 1)
- TS SR 3.6.3.3 – Containment Isolation Manual Valve Sealed Checklist (Path 2)
- TS SR 3.1.2.1 – Verify Measured Core Reactivity (Path 3)

PG&E conducted an Independent Decision Making Panel (IDP) on September 24, 2007, using the guidance in NEI 04-10, Revision 1.

The IDP reviewed proposed changes to TS SR 3.3.5.2 and TS SR 3.1.2.1. The STI evaluation forms, including IDP comments and conclusions are attached. The STI evaluation form for TS SR 3.6.3.3 has not been reviewed by the IDP.

PG&E will conduct another IDP panel for the NRC to observe, that will review TS SR 3.6.3.3 and discuss the two previously reviewed STIs.

	DIABLO CANYON POWER PLANT **SURVEILLANCE TEST INTERVAL EVALUATION FORM**
X.	**SURVEILLANCE TEST INFORMATION**
1.	**Unit(s):** 1 & 2
2.	**Surveillance Test (ST) Number (s) / Revision Number (s)** STP R-4, Revision 13A
3.	**Technical Specification Surveillance Requirement (SR) Number(s):** SR 3.1.2.1
4.	**Technical Specification SR (Text):** ----------------------------NOTE-------------------------------- The predicted reactivity values may 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. --- Verify measured core reactivity is within ± 1% Δk/k of predicted values.
5.	**Technical Specification SR Bases (and Intent):** Core reactivity is verified by periodic comparisons of measured and predicted RCS boron concentrations. The comparison is made, considering that other core conditions are fixed or stable, including control rod position, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed prior to entering MODE 1 as an initial check on core conditions and design calculations at BOC. The SR is modified by a Note. The Note indicates that the normalization (adjustment, only if necessary) 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 changes due to fuel depletion and the presence of other indicators (QPTR, AFD, etc.) for prompt indication of an anomaly.
6.	**Recommended ST Frequency Change:** **From:** 31 EFPD **To:** 92 EFPD

	Note: The terms Surveillance Test Interval (STI) and ST Frequency are used interchangeably.
7.	**Station Benefit:** Each performance of STP R-4 requires approximately 5 reactor engineering man hours. An RCS boron sample is required at nominal hot full power conditions for the surveillance test.
A.	**SYSTEM & MAINTENANCE RULE (MRule) INFORMATION**
1.	**SYSTEM NUMBER:** 95
2.	**SYSTEM DESCRIPTION:** Nuclear Fuel
3.	**CURRENT MRULE RISK SIGNIFICANCE (R-S) CLASSIFICATION:** Risk Significant
4.	**CURRENT MRULE R-S BASIS:** N.A. This is not modeled via the site Probalistic Risk Analysis (PRA) model. It is considered risk significant because it is related to a fission product barrier.
5.	**Current PRA RAW (System):** Not Modeled (MRule R-S threshold: $\geq$ 2.0)
6.	**Current PRA RRW (System):** Not Modeled (MRule R-S threshold: $\geq$ 1.005)

7.	**Current PRA Limiting Sequences:** Not Modeled (MRule R-S threshold: top 90%; Trigger value: N/A
B.	**QUALITATIVE ANALYSIS:**
1.	**COMMITMENT REVIEW (Is STI credited in any commitments?)** No. The Procedure Commitment Database shows no active commitment data records for the implementing document STP R-4. The updated Final Safety Analysis Report (FSAR) does not discuss the frequency of the core reactivity balance surveillance.
2.	**SURVEILLANCE TEST HISTORY OF THE COMPONENTS AND SYSTEM ASSOCIATED WITH THE STI ADJUSTMENT:** A review of STP R-4 surveillance test history was performed for Unit 1 and Unit 2 over cycles 12, 13, and 14. No surveillance tests failures were noted. Unit and cycle-specific surveillance test histories are tabulated below by surveillance date and core average burnup. Reactivity deviations are measured in units of pcm, where 1% $\Delta k/k$ = 1000 pcm. The data for Unit 2 Cycle 12 show an outlier point indicating a reactivity deviation of 417 pcm on 6/25/04. This cause of this larger than expected reactivity deviation is attributed to not having acquired a reactor coolant system boron sample for B-10 analysis. Instead, the depleted (measured) concentration was compared to the undepleted predictions.
3.	**RELIABILITY REVIEW: PERFORMANCE (OPERATION & MAINTENANCE) HISTORY OF THE COMPONENTS AND SYSTEM ASSOCIATED WITH THE STI ADJUSTMENT:** Maintenance Rule Train Actual Unreliability: A fuel leak on Unit 2 is below Action Level "1" of TS6.ID1. Maintenance Rule Unreliability Performance Criteria: Fuel failure that results in Action Level 2 per TS6.ID1. Additional component history review: N/A

4.	**UNAVAILABILITY REVIEW:** Maintenance Rule Train Actual Unavailability: 0 hours Maintenance Rule Unavailability Performance Criteria: 0 hours / year based on failed fuel integrity exceeding T.S. limits resulting in a plant shutdown.
5.	**PAST INDUSTRY AND PLANT-SPECIFIC EXPERIENCE WITH THE FUNCTIONS AFFECTED BY THE PROPOSED CHANGES** Westinghouse Technical Bulletin TB-04-16, "Updated Reactivity Surveillance Policy for B^{10} Isotopic Concentration," discusses the deviations between measured and predicted critical boron concentration exacerbated by not accounting for boron-10 depletion during the operating cycle and refueling outages. Not accounting for B^{10} depletion can lead to errors in shutdown margin calculations, estimated critical conditions during a reactor startup, and routine reactivity balance calculations. Consistent with the recommendations of the Technical Bulletin, Chemistry periodically samples the reactor coolant system (RCS), boric acid storage tank, and refueling water storage tank to determine the boron isotopic ratio. Reactor Engineering uses the measured B^{10} ratio to correct the measured RCS boron concentration for B^{10} depletion for use in reactivity balance calculations. Diablo Canyon implemented an improved B^{10} depletion methodology for reactivity balance calculations in July 2004 and each surveillance since this time has shown a measured-to-predicted deviation of no more than 200 pcm.
6.	**VENDOR-SPECIFIED MAINTENANCE FREQUENCY** N/A.
7.	**TEST INTERVALS SPECIFIED IN APPLICABLE INDUSTRY CODES AND STANDARDS** The test interval is only specified in the Technical Specifications.

8.	**OTHER QUALITATIVE CONSIDERATIONS** From TS 3.1.2 Bases: "Therefore, reactivity balance is used as a measure of the predicted versus measured core reactivity during power operation. The periodic confirmation of core reactivity is necessary to ensure that Design Basis Accident (DBA) and transient safety analyses remain valid. A large reactivity difference could be the result of unanticipated changes in fuel, control rod worth, or operation at conditions not consistent with those assumed in the predictions of core reactivity, and could potentially result in a loss of SDM or violation of acceptable fuel design limits. Comparing predicted versus measured core reactivity validates the nuclear methods used in the safety analysis and supports the SDM demonstrations (LCO 3.1.1, "SHUTDOWN MARGIN (SDM)") in ensuring the reactor can be brought safely to cold, subcritical conditions."
9.	**QUALITATIVE ANALYSIS – CONCLUSIONS** The surveillance test history for the reactivity balance has demonstrated that the core reactivity has been well within the bounds of the acceptance criterion of $\pm$ 1% $\Delta k/k$ of predictions. Based on the testing history, estimated critical condition calculations and physics testing performed as part of the initial reactor startup, relaxation of the STI would not prevent reactor engineering from discovering gross anomalies in core design predictions.
10.	**PHASED IMPLEMENTATION REQUIREMENTS** No phased implementation is recommended due to the relaxation of the STI from 31 EFPD to 92 EFPD.
11.	**PROPOSED SURROGATE MONITORING RECOMMENDATIONS:** No surrogate monitoring is feasible for this surveillance.
12.	**PREPARER:** Prepared by: Shane Guess Date 8/20/2007 (System or Component Specialist)
C.	**PRA ANALYSIS**

1.	**OVERVIEW OF PRA MODELING OF STI** PRA modeling of the surveillance requirement to verify measured core reactivity within ± 1% Δk/k of predicted values is not practical and is not currently modeled in the DCPP PRA model. Current industry wide practices do not model the surveillance requirement to verify measured core reactivity. Current PRA Model: N/A.
2.	**FULL POWER INTERNAL EVENTS (FPIE) LEVEL 1 PRA MODEL IMPACTS** (CDF Comparison against R.G 1.174 limits) N/A, see Item 1.
3.	**FPIE LEVEL 2 PRA MODEL IMPACTS (LERF Comparison against R.G 1.174 limits)** N/A, see Item 1.
4.	**FIRE RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** N/A, see Item 1.
5.	**SEISMIC RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** N/A, see Item 1.
6.	**SHUTDOWN RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** N/A, see Item 1.
7.	**OTHER PRA ISSUES (ex. Impacts from Other External Events excluding seismic & Fire Risk Impacts, or changes in test strategy)** N/A, see Item 1.
8.	**TOTAL EFFECT OF THIS STI EXTENSION ON INTERNAL, EXTERNAL & SHUTDOWN PRAs (CDF & LERF Comparison against R.G 1.174 limits)** N/A, see Item 1.

9.	**CUMULATIVE EFFECT OF ALL RI-TS STI ADJUSTMENTS ON INTERNAL, EXTERNAL & SHUTDOWN PRAs. (CDF & LERF Comparison against R.G 1.174 limits)** N/A, see Item 1.
10.	**IMPACT ON DEFENSE-IN-DEPTH PROTECTION** N/A.
11.	**PRA ANALYSIS – CONCLUSIONS** N/A.
12.	**PREPARER** Prepared by: Nathan Barber Date 8/16/2007 (Risk Management [PRA] Engineer)

D.	**INTEGRATED DECISION-MAKING PANEL REVIEW**	**MEETING DATE:** 09/24/2007
1.	**Presenter(s): Shane Guess, Amir Afzali (PRA)**	
2.	**Meeting Discussion Summary:** A quorum was verified. The IDP meeting followed the agenda fairly close, with the exception that questions and discussion occurred during the STI evaluation presentations, as well as after each conclusion. Actions and IDP required changes were captured during the process, and are documented verified below. (Review of Qualitative and Quantitative analyses, and Cumulative Impact)	
3.	**Meeting Results/Recommendations/Bases:** (Consider: phased implementation, additional performance monitoring of failure rates) (include comment resolution)	
4.	**Approval/Disapproval: Check one of the following:** ☐ STI Approved **X** STI Approved with Comments ☐ STI Disapproved	

<table>
<tr><td rowspan="9"></td><td>IDP/Expert Panel Members</td><td>Listing of IDP attendees:
(signatures not required – see IDP meeting minutes)</td></tr>
<tr><td>1. Engineering*</td><td>Ken Bych</td></tr>
<tr><td>2 Maintenance*</td><td>Mark Frauenheim</td></tr>
<tr><td>3. Operations*</td><td>-------------</td></tr>
<tr><td>4. Risk Management (PRA)*</td><td>Amir Afzali</td></tr>
<tr><td>5 Maintenance Rule Coordinator*</td><td>Don Shelley</td></tr>
<tr><td>6. Surveillance Test Coordinator</td><td>Chuck Dunlap</td></tr>
<tr><td>7. System manager or Component Engineer</td><td>Shane Guess</td></tr>
<tr><td colspan="2">*Also Maintenance Rule Expert Panel Member</td></tr>
<tr><td>5.</td><td colspan="2">IDP COMMENT RESOLUTION

Prepared by: Shane Guess Date: 10/9/2007
(System Manager or Component Specialist)

Prepared by: Amir Afzali Date: 10/4/2007
(Risk Management Engineering)</td></tr>
<tr><td>6.</td><td colspan="2">IDP/Expert Panel Coordinator Final Review/Closure:

(All IDP comments resolved): Chuck Dunlap Date: 10/11/07
(IDP Coordinator)</td></tr>
</table>

DIABLO CANYON POWER PLANT SURVEILLANCE TEST INTERVAL EVALUATION FORM	
X.	**SURVEILLANCE TEST INFORMATION**
1.	**Unit(s):** 1 & 2
2.	**Surveillance Test (ST) Number (s) / Revision Number (s)** STP M-13F Revision 34 STP M-13G Revision 30 STP M-13H Revision 27
3.	**Technical Specification Surveillance Requirement (SR) Number(s):** SR 3.3.5.2
4.	**Technical Specification SR (Text):** Perform TADOT.
5.	**Technical Specification SR Bases (and Intent):** SR 3.3.5.2 is the performance of a TADOT. This test is performed every 18 months. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. For these tests, the relay Setpoints are verified and adjusted as necessary. The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.
6.	**Recommended ST Frequency Change:** **From:** 18 months **To:** 24 months Note: The terms Surveillance Test Interval (STI) and ST Frequency are used interchangeably.
7.	**Station Benefit:** Changing this STI to a 24 month frequency would provide for greater scheduling flexibility. A 24 month frequency is consistent with other surveillance tests on a once per refueling cycle frequency.

A.	SYSTEM & MAINTENANCE RULE (MRule) INFORMATION
1.	**SYSTEM NUMBER:** 63A
2.	**SYSTEM DESCRIPTION:** 4kV Vital
3.	**CURRENT MRULE RISK SIGNIFICANCE (R-S) CLASSIFICATION:** Risk Significant
4.	**CURRENT MRULE R-S BASIS:** Modeled in PRA with a high RAW / RRW value.
5.	**Current PRA RAW (System):** Vital 4kV = 126 (MRule R-S threshold: $\geq$ 2.0)
6.	**Current PRA RRW (System):** Vital 4 kV = 1.12 (MRule R-S threshold: $\geq$ 1.005)

7.	**Current PRA Limiting Sequences:** 4713 saved sequences (MRule R-S threshold: top 90%; Trigger value: 363) The system in question appears in the top 90% of sequences.
B.	**QUALITATIVE ANALYSIS:**
1.	**COMMITMENT REVIEW (Is STI credited in any commitments?)** A PCD search was performed for STP M-13F, STP M-13G, and STP M-13H for units 1 and 2. No PCD commitments exist that address the frequency of testing.
2.	**SURVEILLANCE TEST HISTORY OF THE COMPONENTS AND SYSTEM ASSOCIATED WITH THE STI ADJUSTMENT:** Review of the last 6 years of surveillance test history for these STPs show only one performance case (1R13) when STP M-13G (EDG 12) did not meet its acceptance criteria for transfer of the 4 KV Bus G to EDG 12 on second level undervoltage. The time from opening of the 4 KV Bus G feeder breaker to EDG 12 breaker closing on the Bus was exceeded by 7.1 sec. This failure was due to an Agastat Timing Relay (ETR14D) setpoint drift. The same type of relay caused a CCW Pump failure to start during performance of STP M-15. In this case the relay failed to actuate. The Agastat ETR14D timers have shown high reliability over the years and the above two incidents may have been the result of work activities in the panels by external contract workers during that outage.
3.	**RELIABILITY REVIEW:** **PERFORMANCE (OPERATION & MAINTENANCE) HISTORY OF THE COMPONENTS AND SYSTEM ASSOCIATED WITH THE STI ADJUSTMENT:** Maintenance Rule Train Actual Unreliability: U1 Bus F = 1 MPFF (all other U1 & 2 Busses = 0) Maintenance Rule Unreliability Performance Criteria: < 1 MPFF in 2 years Additional component history review: The above review is for the past 2 years for Busses F, G and H for Units 1 and 2.
4.	**UNAVAILABILITY REVIEW:** Maintenance Rule Train Actual Unavailability: 0 hours Maintenance Rule Unavailability Performance Criteria: 0 hours / year

5.	**PAST INDUSTRY AND PLANT-SPECIFIC EXPERIENCE WITH THE FUNCTIONS AFFECTED BY THE PROPOSED CHANGES** Review of industry operating experience on ETR14D Time-Delay Relays found 25 issues in the past 21 years. Most of the issues involved poor solder connections. No, applicability to DCPP experience was found. Most operating experience associated with Agastat Time-Delay Relays has been associated with the electro-pneumatic models. Search of operating experience with these relays at DCPP showed only 2 reliability issues in the past. PG&E does not consider the two failures to be indicative of a larger problem with the Agastat ETR14D Time – Delay Relays based on good performance by the relays in the past and successful testing of the other relays during 1R13, 2R13 and 1R14.
6.	**VENDOR-SPECIFIED MAINTENANCE FREQUENCY** All DCPP 4 KV Bus Autotransfer relays are tested in accordance with vendor recommendations, which are part of DCPP's PM program. 27HFT1, 27HGT1, 27HHT1 - Basler BE1-27 Basler relays are static devices which require no preventive maintenance other than a periodic operational check. The operational test procedure of Section 5, Tests and Adjustments, provides an adequate check to verify proper operation of the relay. Most components are on conformally-coated PC boards. In-house replacement of individual components may be difficult and should not be attempted unless appropriate equipment and qualified personnel are available. The relay may be returned to the factory for repair. When returning the relay to the factory, ship the entire relay cradle assembly preferably in its case. 27HFT2, 27HGT2, 27HHT2 - West. SSV-T 27HFB3, 27HGB3, 27HHB3 27HFB4, 27HGB4, 27HHB4 Ref 663332-80-7 Check calibration and clean contacts every year. 27HFB2, 27HGB2, 27HHB2 - Basler BE1-GPS100 Because the BE1-GPS100 has extensive internal test capabilities, periodic testing of the protection system can be greatly reduced. Relay operating characteristics are a function of programming instructions that do not drift over time. Thus, the user may wish to verify items that the relay's self-testing features cannot completely determine. Periodic testing might consist of the following settings and function checks: -Verify that the set points that were proven during commissioning have not been changed.

	-Verify that the inputs and outputs are interfacing properly with the rest of the protection and control system. -Verify that the power system analog parameters used by the protection and control functions are being measured accurately. 27XHFB2, 27XGB2, 27XHB2 - West. SG 27YHFB2, 27YHGB2, 27YHHB2 27ZHFB2, 27ZHGB2, 27ZHHB2 No manufacturer maintenance recommendation found. Ref 663102-24 62HF3A, 62HG3A, 62HH3A - Agastat ETR 62HF3B, 62HG3B, 62HH3B Replacement Schedule – Series EGP/EML/ETR The qualified life of these relays is 25,000 electrical operations or 10 years from the date of manufacture, whichever occurs first.
7.	**TEST INTERVALS SPECIFIED IN APPLICABLE INDUSTRY CODES AND STANDARDS** There are no industry codes or standards that specify test intervals for bus autotransfer.
8.	**OTHER QUALITATIVE CONSIDERATIONS** (include: comparison to Improved TS, alternate ST test list [retained], LCO review [optional], assumptions in plant licensing basis, degree ST provides conditioning exercise for operability, etc.) NONE
9.	**QUALITATIVE ANALYSIS – CONCLUSIONS** Based on the review of the above tests performed over the past several years, it is recommended that these Surveillance Tests be extended from an 18-month to 24-month frequency.
10.	**PHASED IMPLEMENTATION REQUIREMENTS** NONE

11.	**PROPOSED SURROGATE MONITORING RECOMMENDATIONS:** Maintenance Rule.
12.	**PREPARER:** Prepared by: Stefan Bednarz Date 8/29/2007 (System Manager or Component Specialist)
C.	**PRA ANALYSIS**
1.	**OVERVIEW OF PRA MODELING OF STI** The surveillance requirement of interest tests the actuation of undervoltage relays required for a start of the Emergency Diesel Generators (EDG). The DCPP PRA model considers these undervoltage relays in the modeling of EDG components. The application base model DC015BA was created by incorporating the standby failure rate component for the U/V relays into model DC01, the current DCPP PRA model of record. Model DC015BA1 was created with the proposed surveillance interval (24 months) incorporated into the standby failure rate calculation for U/V relays. Current PRA Model: <u>DC015BA</u>
2.	**FULL POWER INTERNAL EVENTS (FPIE) LEVEL 1 PRA MODEL IMPACTS** (CDF Comparison against R.G 1.174 limits) FPIE CDF from DC015BA is 1.077E-05/year. FPIE CDF for DC015BA1 is 1.0797E-05/year. ΔCDF = 2.7E-08/year (< 1E-06/year 1.174 limits)
3.	**FPIE LEVEL 2 PRA MODEL IMPACTS (LERF Comparison against R.G 1.174 limits)** FPIE LERF from DC015BA is 1.4952E-06/year. FPIE LERF from DC015BA1 is 1.4966E-06/year. ΔLERF = 1.4E-09/year (< 1E-07/year 1.174 limits)

4.	**FIRE RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** Fire CDF from DC015BA is 1.7014E-05/year. Fire CDF from DC015BA1 is 1.7015E-05/year. ΔCDF = 1E-09/year (< 1E-06/year 1.174 limits). Fire LERF is not quantified in the DCPP PRA model. Assuming a constant ratio for LERF in non SGTR/ISLOCA sequences fire LERF was estimated to be: ΔLERF = ILERF/ICDF*FCDF=2.55E-02*1E09/year = 2.55E-11. Additionally, the DCPP IPEEE did not identify any significant vulnerabilities to containment isolation as a result of fire.
5.	**SEISMIC RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** Seismic CDF from DC015BA is 3.7765-05/year. Fire CDF from DC015BA1 is 3.7772-05/year. ΔCDF=7E-09/year (< 1E-06/year 1.174 limits) Seismic LERF from DC015BA is 1.8919E-06/year. Seismic LERF from DC015BA1 is 1.8919-06/year. The change in seismic LERF is negligible.
6.	**SHUTDOWN RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** DCPP currently uses a simplistic ORAM-Sentinel shutdown PRA model to characterize risk during outages. A typical hot midloop outage "accumulates" around 3E-06 CDF (3E-06/18 month refueling cycle = 1.67E-07/year shutdown CDF). When compared to the average CDF for the FPIE model, shutdown risk is nearly 2 orders of magnitude lower. Given the relatively low contribution from shutdown risk to total risk, a conservative assumption of this shutdown risk would be to double the ΔCDF and ΔLERF obtained from the FPIE model. ΔCDF=5.4E-08/year ΔLERF=2.8E-09/year Additionally, STP M-13 is currently performed during an outage. With the change to a 24 month period, the exposure time for outage risk will always be less than 18 months since the test will have been performed at some point online prior to the outage (With an 18 month refueling cycle). The ΔCDF between the current testing practice and the new with a shorter exposure time from online test to outage will be negative.

7.	**OTHER PRA ISSUES (ex. Impacts from Other External Events excluding seismic & Fire Risk Impacts, or changes in test strategy)** No other external events have been identified that would impact these results. Internal flooding is considered as part of the full power internal events model.
8.	**TOTAL EFFECT OF THIS STI EXTENSION ON INTERNAL, EXTERNAL & SHUTDOWN PRAs (CDF & LERF Comparison against R.G 1.174 limits)** Total ΔCDF = 8.90E-08 (< 1E-06/year 1.174 limits) Total ΔLERF = 4.20E-09 (< 1E-07/year 1.174 limits)
9.	**CUMULATIVE EFFECT OF ALL RI-TS STI ADJUSTMENTS ON INTERNAL, EXTERNAL & SHUTDOWN PRAs. (CDF & LERF Comparison against R.G 1.174 limits)** "The proposed change documented in this worksheet, is the first example that will have an impact on the PRA figures of merit. Therefore, the cumulative effect is equal to the effect calculated for this example."
10.	**IMPACT ON DEFENSE-IN-DEPTH PROTECTION** DCPP has 3 EDGs and 2 offsite power circuits available to mitigate an accident. The small increase in the standby failure will not significantly degrade the emergency AC power defense in depth.
11.	**PRA ANALYSIS – CONCLUSIONS** The results of the PRA analysis indicate that an extension in the surveillance interval for EDG undervoltage start relays is not risk significant based on a comparison to RG 1.174 limits for CDF and LERF.
12.	**PREPARER** Prepared by: Nathan Barber Date 8/20/2007 (Risk Management [PRA] Engineer)

D.	INTEGRATED DECISION-MAKING PANEL REVIEW	MEETING DATE: 09/24/2007
1.	**Presenter(s): Stephan Bednarz, Amir Afzali (PRA)**	
2.	**Meeting Discussion Summary:** A quorum was verified. The IDP meeting followed the agenda fairly close, with the exception that questions and discussion occurred during the STI evaluation presentations, as well as after each conclusion. Actions and IDP required changes were captured during the process, and are documented verified below. (Review of Qualitative and Quantitative analyses, and Cumulative Impact)	
3.	**Meeting Results/Recommendations/Bases**: (Consider: phased implementation, additional performance monitoring of failure rates) (include comment resolution)	
4.	**Approval/Disapproval: Check one of the following:** ☐ STI Approved X STI Approved with Comments ☐ STI Disapproved	

IDP/Expert Panel Members	Listing of IDP attendees: (signatures not required – see IDP meeting minutes)
1. Engineering*	Ken Bych
2 Maintenance*	Mark Frauenheim
3. Operations*	-------
4. Risk Management (PRA)*	Amir Afzali
5 Maintenance Rule Coordinator*	Don Shelley
6. Surveillance Test Coordinator	Chuck Dunlap
7. System manager or Component Engineer	Stefan Bednarz

***Also Maintenance Rule Expert Panel Member**

5.	**IDP COMMENT RESOLUTION** Prepared by: Stefan Bednarz Date: 10/4/2007 (System Manager or Component Specialist) Prepared by: Amir Afzali Date: 10/4/2007 (Risk Management Engineering)
6.	**IDP/Expert Panel Coordinator Final Review/Closure:** (All IDP comments resolved) Chuck Dunlap Date: 10/10/2007 (IDP Coordinator)

DIABLO CANYON POWER PLANT SURVEILLANCE TEST INTERVAL EVALUATION FORM	
X.	**SURVEILLANCE TEST INFORMATION**
1.	**Unit(s):** 1&2
2.	**Surveillance Test (ST) Number (s) / Revision Number (s)** STP V-6A, Unit 1 / Revision 1 STP V-6A, Unit 2 / Revision 1 STP I-1D, Unit 1 / Revision 76 STP I-1D, Unit 2 / Revision 58 STP I-1F, Unit 1 / Revision 5 STP I-1F, Unit 2 / Revision 6
3.	**Technical Specification Surveillance Requirement (SR) Number(s):** 3.6.3.3
4.	**Technical Specification SR (Text):** ----------------------------NOTE-------------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. -- Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.
5.	**Technical Specification SR Bases (and Intent):** 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 of the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, which may include the use of local or remote indicators, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. The SR specifies that containment isolation valves that are open under administrative controls are not required to meet the SR during the time the valves are open. This SR does not apply to valves that are locked, sealed, or otherwise secured in a closed position since these were verified to be in the correct position upon locking, sealing, or securing.

	The Note applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, 3 and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.
6.	**Recommended ST Frequency Change:** **From:** 31 days **To:** 92 days Note: The terms Surveillance Test Interval (STI) and ST Frequency are used interchangeably.
7.	**Station Benefit:** Changing the frequency of SR 3.6.3.3 will reduce the man hours required to perform STP V-6A, STP I-1D, and STP I-1F, and will result in less radiation exposure.
A.	**SYSTEM & MAINTENANCE RULE (MRule) INFORMATION**
1.	**SYSTEM NUMBER:** 45B
2.	**SYSTEM DESCRIPTION:** Containment Isolation Vlvs
3.	**CURRENT MRULE RISK SIGNIFICANCE (R-S) CLASSIFICATION:** Risk Significant
4.	**CURRENT MRULE R-S BASIS:** Modeled in PRA.
5.	**Current PRA RAW (System):** 1.0 (MRule R-S threshold: $\geq$ 2.0)
6.	**Current PRA RRW (System):** 1.0 (MRule R-S threshold: $\geq$ 1.005)

7.	**Current PRA Limiting Sequence:** Not applicable since this system's contribution is only to LERF. LERF sequences were not used for Maintenance Rule RS determination. (MRule R-S threshold: top 90%; Trigger value: n/a)
B.	**QUALITATIVE ANALYSIS:**
1.	**COMMITMENT REVIEW (Is STI credited in any commitments?)** A review of the PCD was performed for TS SR 3.3.6.3, and procedures STP V-6A, STP I-1D, and STP I-1F. Commitment T32700 will require an update to reference the revised frequency, or to remove the frequency from the description. T32700 makes reference to the 31 day frequency of SR 3.6.3.3.
2.	**SURVEILLANCE TEST HISTORY OF THE COMPONENTS AND SYSTEM ASSOCIATED WITH THE STI ADJUSTMENT:** An AR search was performed covering the past 3 years with no cases of improperly positioned valves associated with SR 3.3.6.3 at power. Event database for the past two years (limit of current database) was reviewed for improperly positioned containment isolation valves with none noted.
3.	**RELIABILITY REVIEW:** **PERFORMANCE (OPERATION & MAINTENANCE) HISTORY OF THE COMPONENTS AND SYSTEM ASSOCIATED WITH THE STI ADJUSTMENT:** Maintenance Rule Train Actual Unreliability: 5MPFF in 2 years (unit 1), 0MPFF in 2 years (unit 2) Maintenance Rule Unreliability Performance Criteria: < 2MPFF in 2 years Note: None of the MPFF on Unit 1 are related to valve mispositions or missing seals.
4.	**UNAVAILABILITY REVIEW:** Maintenance Rule Train Actual Unavailability: 0 hrs (unit 1 and 2) Maintenance Rule Unavailability Performance Criteria: 0 hrs / year

5.	**PAST INDUSTRY AND PLANT-SPECIFIC EXPERIENCE WITH THE FUNCTIONS AFFECTED BY THE PROPOSED CHANGES** Review of INPO OE database revealed several instances, mostly in reports to the NRC, where small containment isolation valves were found open, rather than in their required position. In general, most of the instances reviewed were cases where the valves were not properly included in the required surveillance. These instances would not be applicable to extension of the surveillance interval as the equipment is already included in the required tests. In two instances found, valves were opened after the surveillance was performed and left open. In both cases, the implementing procedures did not have adequate administrative controls. In both cases, the problem was not found during reperformance of the surveillance, but rather due to review of either other completed tests or by personnel during routine activities. Increasing the frequency of the surveillance would prevent finding errors of this nature as soon as the current surveillance interval would require. None of the reports reviewed had any significant safety significance.
6.	**VENDOR-SPECIFIED MAINTENANCE FREQUENCY** N/A. Verifying the containment isolation sealed valve checklist is not a maintenance activity. No frequency is specified by valve manufacturers for verifying sealed valve positions.
7.	**TEST INTERVALS SPECIFIED IN APPLICABLE INDUSTRY CODES AND STANDARDS** None.
8.	**OTHER QUALITATIVE CONSIDERATIONS** None.
9.	**QUALITATIVE ANALYSIS – CONCLUSIONS** This change will not affect the condition of the valves, and will have no affect on their performance. No instances of mispositioned sealed valves or missing seals could be found reviewing ARs over the past three years. Based on review of the above information, it is recommended that the STI be revised from 31 days (monthly) to 92 days (quarterly).
10.	**PHASED IMPLEMENTATION REQUIREMENTS** None recommended.

11.	**PROPOSED SURROGATE MONITORING RECOMMENDATIONS:** Use existing Maintenance Rule monitoring.
12.	**PREPARER:** Prepared by: Tony Chitwood Date 9/26/2007 (System Manager or Component Specialist)
C.	**PRA ANALYSIS**
1.	**OVERVIEW OF PRA MODELING OF STI** OVERVIEW OF PRA MODELING OF STI This Surveillance Requirement involves a monthly walkdown of unsealed, manual containment isolation valves to verify these valves are closed and capped. The modeling approach used was to determine the likelihood that one of the subject valves was left open and contributes to Large Early Release Frequency (LERF). None of the valves reviewed are larger than 2" valves and would not, by themselves, contribute to LERF. Only cases in which two valves were open simultaneously were considered. A common cause coupling factor was used. A review of plant history (AR search) for the valves of concern was performed to determine if any of these valves had been found open at power. Only one valve was found open and its condition was corrected prior to the end of a refueling outage. This single incidence was used to calculate the likelihood of a valve remaining open past the end of a refueling outage for the plant's 42 reactor-year operating history. The periodic walkdown is assumed to discover the open valve either 1 month or 3 months after a refueling outage for the current and future STIs respectively. DC015BB calculates LERF for the 1 month surveillance interval and DC015BB1 calculates LERF for the proposed 3 month surveillance interval. Current PRA Model: <u>DC015BB/DC015BB1</u>
2.	**FULL POWER INTERNAL EVENTS (FPIE) LEVEL 1 PRA MODEL IMPACTS** 0 - CIVs do not impact CDF. (CDF Comparison against R.G 1.174 limits)

3.	**FPIE LEVEL 2 PRA MODEL IMPACTS (LERF Comparison against R.G 1.174 limits)** ΔLERF = 2.1E-09/year (< 1E-07/year 1.174 limits)
4.	**FIRE RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** ΔCDF = 0 - CIVs do not impact CDF. (< 1E-06/year 1.174 limits) ΔLERF = 3.79E-09/year - Calculated by assuming constant LERF/CDF ratio. FLERF is not calculated directly by model. (< 1E-07/year 1.174 limits)
5.	**SEISMIC RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** ΔCDF = 0 - CIVs do not impact CDF. (< 1E-06/year 1.174 limits) ΔLERF = 8.5E-09/year (< 1E-07/year 1.174 limits)
6.	**SHUTDOWN RISK IMPACTS (CDF & LERF Comparison against R.G 1.174 limits)** DCPP currently uses a simplistic ORAM-Sentinel shutdown PRA model to characterize risk during outages. A typical hot midloop outage "accumulates" around 3E-06 CDF (3E-06/18 month refueling cycle = 1.67E-07/year shutdown CDF). When compared to the average CDF for the FPIE model, shutdown risk is nearly 2 orders of magnitude lower. Given the relatively low contribution from shutdown risk to total risk, a conservative assumption of this shutdown risk would be to double the ΔCDF and ΔLERF obtained from the FPIE model. ΔCDF=0 ΔLERF=4.2E-09/year
7.	**OTHER PRA ISSUES (ex. Impacts from Other External Events excluding seismic & Fire Risk Impacts, or changes in test strategy)** No other external events have been identified that would impact these results. Internal flooding is considered as part of the full power internal events model.
8.	**TOTAL EFFECT OF THIS STI EXTENSION ON INTERNAL, EXTERNAL & SHUTDOWN PRAs (CDF & LERF Comparison against R.G 1.174 limits)** Total ΔCDF=0.0 Total ΔLERF = 2.04E-08/year

9.	**CUMULATIVE EFFECT OF ALL RI-TS STI ADJUSTMENTS ON INTERNAL, EXTERNAL & SHUTDOWN PRAs. (CDF & LERF Comparison against R.G 1.174 limits)**

Cumulative LERF

ΔILERF	ΔSLERF	ΔFLERF	ΔShutdown LERF	Total ΔLERF
3.50E-09	1.03E-08	3.82E-09	7.00E-09	2.46E-08

Cumulative CDF

ΔICDF	ΔSCDF	ΔFCDF	ΔShutdown CDF	Total ΔCDF
2.70E-08	7.0E-09	1.00E-09	5.40E-08	8.90E-08

All values are less than RG 1.174 limits.

10.	**IMPACT ON DEFENSE-IN-DEPTH PROTECTION** Given the low likelihood that more than one of the subject valves is left open inadvertently (Only one of these valves was discovered open over DCPP's operating history), the impact on containment isolation defense-in-depth is minimal.
11.	**PRA ANALYSIS – CONCLUSIONS** The results of the PRA analysis indicate that an extension in the surveillance interval for CIV verification is not risk significant based on a comparison to RG 1.174 limits for CDF and LERF.
12.	**PREPARER** Prepared by: Nathan Barber Date 8/20/2007 (Risk Management [PRA] Engineer)

D.	**INTEGRATED DECISION-MAKING PANEL REVIEW**	**MEETING DATE:** ______
1.	**Presenter(s):**	

2.	**Meeting Discussion Summary:** (Review of Qualitative and Quantitative analyses, and Cumulative Impact)
3.	**Meeting Results/Recommendations/Bases**: (Consider: phased implementation, additional performance monitoring of failure rates) (include comment resolution)
4.	**Approval/Disapproval: Check one of the following:** ☐ STI Approved ☐ STI Approved with Comments ☐ STI Disapproved **IDP/Expert Panel Members** — Listing of IDP attendees: (signatures not required – see IDP meeting minutes) 1. Engineering* __________ 2 Maintenance* __________ 3. Operations* __________ 4. Risk Management (PRA)* __________ 5 Maintenance Rule Coordinator* __________ 6. Surveillance Test Coordinator __________ 7. System or Component Engineer __________ ***Also Maintenance Rule Expert Panel Member**
5.	**IDP COMMENT RESOLUTION** Prepared by: ____________________ Date: ________ (System or Component Specialist) Prepared by: ____________________ Date: ________ (Risk Management Engineering)

2.	**Meeting Discussion Summary:** (Review of Qualitative and Quantitative analyses, and Cumulative Impact)
3.	**Meeting Results/Recommendations/Bases:** (Consider: phased implementation, additional performance monitoring of failure rates) (include comment resolution)
4.	**Approval/Disapproval: Check one of the following:** ☐ STI Approved ☐ STI Approved with Comments ☐ STI Disapproved **IDP/Expert Panel Members** — Listing of IDP attendees: (signatures not required – see IDP meeting minutes) 1. Engineering* __________ 2 Maintenance* __________ 3. Operations* __________ 4. Risk Management (PRA)* __________ 5 Maintenance Rule Coordinator* __________ 6. Surveillance Test Coordinator __________ 7. System or Component Engineer __________ ***Also Maintenance Rule Expert Panel Member**
5.	**IDP COMMENT RESOLUTION** Prepared by: ____________________ Date: ________ (System or Component Specialist) Prepared by: ____________________ Date: ________ (Risk Management Engineering)

6.	**IDP/Expert Panel Coordinator Final Review/Closure:** (All IDP comments resolved) ______________________ Date: ______________ (IDP Coordinator)

QUALITY AND SCOPE OF THE PRA MODEL

Technical Adequacy and Scope of the PRA Model

The technical adequacy of the probabilistic risk assessment (PRA) must be compatible with the safety implications of the proposed Technical Specification (TS) changes and the role the PRA plays in justifying the changes. The Nuclear Regulatory Commission (NRC) has developed regulatory guidance to address PRA technical adequacy, Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" [Reference a], which addresses the use of the American Society of Mechanical Engineers (ASME) RA-Sa-2003, Addenda to ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" [Reference b], and the NEI peer review process NEI 00-02, "PRA Peer Review Process Guidance" [Reference c].

NEI 04-10 [Reference d] requires an assessment of the PRA models used to support the Surveillance Frequency Control Program (SFCP) against the criteria of RG 1.200 to ensure that the PRA models are capable of determining the change in risk due to changes to surveillance frequencies of systems, structures, and components (SSCs), using plant-specific data and models. Capability Category II of ASME RA-Sb-2003 is applied as the standard, and any identified deficiencies relative to those requirements are assessed further in sensitivity studies to determine any impacts on proposed changes to surveillance frequencies. This level of PRA technical adequacy, combined with the proposed sensitivity studies, is sufficient to support the evaluation of changes to surveillance frequencies within the SFCP, and is consistent with Regulatory Position 2.3.1 of RG 1.177 [Reference e].

The Diablo Canyon Power Plant (DCPP) PRA model used in this evaluation is a full-scope Level 1 and Level 2 PRA model that addresses internal, seismic, and fire events at full power. The large early release frequency (LERF) figure of merit is calculated using the full Level 2 PRA model. The PRA model was developed for Unit 1, but it is equally applicable to Unit 2 since the two units are essentially identical.

The PRA model is based on the original 1988 Diablo Canyon PRA (DCPRA-1988) model [Reference f] that was developed as part of the Long-Term Seismic Program (LTSP) [Reference g]. The DCPRA-1988 was a full-scope Level 1 PRA that evaluated internal and external events. The NRC reviewed the LTSP and issued Supplement No. 34 to NUREG-0675 [Reference h] in June 1991, accepting the DCPRA-1988. Brookhaven National Laboratory (BNL) performed the primary review of the DCPRA-1988 for the NRC; their review is documented in NUREG/CR-5726 [Reference i].

The DCPRA-1988 was subsequently updated to support the Individual Plant Examination (IPE) in 1991 and the Individual Plant Examination for External Events (IPEEE) in 1993. Since 1993, several other updates have been made to incorporate plant and procedure changes, update plant-specific reliability and unavailability data, improve the fidelity of the model, incorporate Westinghouse Owners Group (WOG) Peer

Review comments [Reference j], and support other applications, such as On-line Maintenance, Risk-Informed In-Service Inspection (RI-ISI), Emergency Diesel Generator Completion Time Extension (EDG CTE), and Mitigating System Performance Index (MSPI).

The enhancements to the DCPRA-1988 PRA model include:

- Modeling the probability of a loss-of-offsite power (LOSP) subsequent to non-LOSP initiating events
- Incorporating the sixth emergency diesel generator
- Upgrading the auxiliary saltwater system model to be more consistent with the Station Blackout submittal
- Allowing credit for cross-tie of the vital 4kV buses (i.e., one diesel generator (DG) feeds loads on two vital buses)
- Adding a 500kV switchyard model, to supplement the 230kV switchyard model
- Updating initiating event frequencies to reflect data from NUREG-5750 [Reference k]
- Using the Rhodes Model to characterize the reactor coolant pump (RCP) seal performance on loss of cooling and seal injection
- Modeling of the fire water storage tank (FWST) as a supplemental water source to the condensate storage tank (CST) as required
- Modification of the loss of offsite power initiating event. The modification was to breakdown the total loss of offsite power frequency into 4 different types of causes and to assign a separate initiating event frequency/offsite power recovery probability for each cause.
- Updating the Level 2 PRA model to allow a more realistic assessment of the Large Early Release Frequency figure or merit.

The DCPRA is a living PRA, which is maintained through a periodic review and update process.

Peer Review (Certification) of the DCPP PRA model, using the WOG Peer Review Certification Guidelines, was performed in May 2000 [Reference j]. On the basis of its evaluation, the Certification Team determined that, with certain facts and observations (F&Os) addressed, the technical adequacy of all elements of the PRA would be sufficient to support risk significance evaluations with defense-in-depth input, for RI applications. The two "A" F&Os, related to the human reliability analysis (HRA) were addressed by upgrading the methodology used for the evaluation. The upgraded HRA was recently subjected to a focused peer review. All the findings of this focused review will be addressed prior to implementation of the proposed TS changes either by modifying the model or treatment of the issue via a sensitivity study.

The "B" F&Os from the WOG Peer Review have also been addressed during model updates in support of the EDG CTE license amendment request (LAR), the LAR effort to extend the CTs for several emergency core cooling system (ECCS) components, and MSPI calculations.

In addition to the Peer Review, three recent limited scope and independent assessments of the DCPP PRA Level 1 and Level 2 PRA models have been performed by leading industry PRA experts (i.e., Gap Analyses) to support several risk-informed applications, including the MSPI calculations and DCPP's transition to the National Fire Protection Association (NFPA) 805 Standard. All the findings of these assessments will be addressed prior to implementation of the proposed TS changes and based on the system being subject to change either by modifying the model or treatment of the issue via a sensitivity study. This approach is consistent with the requirements of NEI 04-10 [Reference d]. Since Initiative 5b could be applied to many different systems, DCPP intends to disposition each open finding as it applies to the system for which its Surveillance Frequency is to be modified using the risk-informed application (i.e., at the sub-application level) consistent with the approach that will be proposed by the PWR Owners Group (PWROG).

Additionally, it should be noted that during the MSPI industry cross-comparison review, the DCPP PRA model was not identified as an outlier.

<u>External Events</u>

As stated above, the DCPP PRA model used in this evaluation is a full scope Level 1 and Level 2 PRA model that addresses internal, seismic, and fire events at full power.

Seismic PRA Model

Again, as stated above, the original DCPP PRA model, including the seismic model, was reviewed by the NRC and found to have sufficient technical adequacy. Although DCPP's equipment fragilities and seismic hazard curves have not been updated, the plant response model, which is based on the internal events model, has been updated several times.

Fire PRA Model

The original Fire PRA model was updated to support the 1993 IPEEE. Other than Control Room (CR) and Cable Spreading Room (CSR) fire scenarios, the Fire PRA quantifies the core damage frequency (CDF) associated with most internal fire initiating events using the same linked event tree models as the internal and seismic events analyses. Separate event trees using conservative assumptions were developed for evaluating CR and CSR fire scenarios. Currently, the Fire PRA model is being upgraded to a state-of-the-art model to support transitioning the fire protection program to the NFPA-805 Standard.

Other External Events

The evaluation of high winds, external floods, and other external events, which was done as part of the IPEEE, revealed no potential vulnerabilities.

Conclusions on PRA Technical Adequacy and Scope

Due to the sound basis of the original model as documented in NUREG-0675 Supplement No. 34 [Reference g] and NUREG/CR-5726 [Reference h] and the considerable effort to incorporate the latest industry insights into the PRA using self-assessments and peer reviews, PG&E is confident that the application of the DCPP PRA model will meet the expectations for PRA technical adequacy. PG&E will either close all identified RG 1.200 gaps, or will address the gaps through sensitivity studies for the surveillance test interval being evaluated using the NEI 04-10 [Reference d] process and methodology. PG&E commits to evaluate the impact of future model updates (internal model or external model) on the conclusions of the assessments that are performed in support of this application. This approach is judged to be the most effective approach in assuring the appropriateness of the PRA technical adequacy and scope.

References

a) RG 1.200, Revision 1, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk- Informed Activities," dated January 2007.

b) American Society of Mechanical Engineers (ASME) RA-Sa-2003, Addenda to ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated December 5, 2003.

c) NEI 00-02, Revision A3, "PRA Peer Review Process Guidance," dated March 20, 2000.

d) NEI 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," dated April 15, 2007.

e) Regulatory Guide 1.177, "An Approach for Plant-Specific Risk-Informed Decisionmaking: Technical Specification," US Nuclear Regulatory Commission, dated August 1998.

f) PLG, Inc., "Diablo Canyon Probablilistic Risk Assessment," prepared for Pacific Gas and Electric Company, PLG-0637, July 1998.

g) Pacific Gas and Electric Company, "Long Term Seismic Program Final Report," PG&E Letter No. DCL-88-192, July 31, 1988.

h) U.S. Nuclear Regulatory Commission, "Safety Evaluation Report," Supplement No. 34 to NUREG-0675, dated June 1991.

i) Bozoki, G., et al., "Review of the Diablo Canyon Probabilistic Risk Assessment," NUREG/CR-5726 (DRAFT), June 1991.

j) "Diablo Canyon Power Plant Probabilistic Risk Assessment Peer Review Report – Final Report," dated August 2000.

k) NUREG/CR-5750, INEEL/EXT-98-00401, "Rates of Initiating Events at U.S. Nuclear Power Plants: 1987-1995," February 1999.

l) Peer Review (Certification) of the DCPP PRA model, using the WOG Peer Review Certification Guidelines, was performed in May 2000.

COMMITMENTS

1) PG&E will provide fresh marked up and retyped Technical Specification (TS) pages prior to approval of this LAR.

2) PG&E will conduct another Integrated Decisionmaking Panel (IDP) panel for the NRC to observe, that will review TS SR 3.6.3.3 and discuss the two previously reviewed surveillance test intervals (STIs).

3) PG&E commits to evaluate the impact of future model updates (internal model or external model) on the conclusions of the assessments that are performed in support of this application.

4) The upgraded human reliability analysis was recently subjected to a focused peer review. All the findings of this focused review will be addressed prior to implementation of the proposed TS changes either by modifying the model or treatment of the issue via a sensitivity study.

5) Three recent limited scope and independent assessments of the DCPP PRA Level 1 and Level 2 PRA models have been performed by leading industry PRA experts (i.e., Gap Analyses) to support several risk-informed applications, including the MSPI calculations and DCPP's transition to the National Fire Protection Association (NFPA) 805 Standard. All the findings of these assessments will be addressed prior to implementation of the proposed TS changes and based on the system being subject to change either by modifying the model or treatment of the issue via a sensitivity study.

6) PG&E will either close all identified RG 1.200 gaps, or will address the gaps through sensitivity studies for the surveillance test interval being evaluated using the NEI 04-10 process and methodology.