AmerenUE
Callaway Plant

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August 5, 2010

ULNRC-05725

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.90

Ladies and Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
APPLICATION FOR TECHNICAL SPECIFICATION CHANGE REGARDING RISK-INFORMED JUSTIFICATION FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM
(LDCN 10-0020)

In accordance with the provisions of Title 10 of the Code of Federal Regulations (10 CFR Part 50.90), "Application for amendment of license, construction permit, or early site permit," AmerenUE requests an amendment to Facility Operating License NPF-30 for Callaway Plant. The proposed amendment would modify Callaway Plant Technical Specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the guidance of Nuclear Energy Institute (NEI) 04–10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies."

AmerenUE Callaway Plant is a member of the Strategic Teaming and Resource Sharing (STARS) alliance. This amendment request has been prepared in conjunction with STARS and utilized the lessons learned from previous STARS amendments requests. The STARS alliance has previously obtained approval for two member utilities to utilize the provisions of NEI 04-10. Additional STARS utilities are considering similar risk informed application requests. The STARS alliance plans on using the experience and resources of the alliance in order to share programs, training and procedures relative to a licensee-controlled surveillance frequency control program.

All required information is provided in the attachments to this letter. Attachment 1 provides a description of the proposed changes, the required confirmation of applicability, and plant-specific verifications. Attachment 2 provides documentation of PRA technical adequacy. Attachment 3 provides the existing TS pages marked up to show the proposed change. Attachment 4 provides revised (re-typed) TS pages.

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Attachment 5 provides the proposed TS Bases changes. Attachment 6 provides the Proposed No Significant Hazards Consideration. (It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92, "Issuance of amendment." Pursuant to 10 CFR 51.22, "Criterion categorical exclusion or otherwise not requiring environmental review," Section (b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.) Attachment 7 provides a cross-reference between Technical Specification Task Force (TSTF)-425 (NUREG-1431) and the Callaway Plant Technical Specifications. Attachment 8 provides a list of commitments made in this application.

The Callaway Onsite Review Committee and a subcommittee of the Nuclear Safety Review Board have reviewed and approved the proposed changes and have approved the submittal of this amendment application.

AmerenUE requests approval of the proposed license amendment by April 2011, with the amendment to be implemented within 180 days following NRC approval of the license amendment.

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

If there are any questions, please contact Mr. David Shafer at 314-225-1056 or Mr. Roger Wink at 314-225-1561.

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

Sincerely,

Scott M

Scott Maglio
Regulatory Affairs Manager

Executed on: 8/5/2010

DS/nls

Attachments:

- Attachment 1 – Description and Assessment
- Attachment 2 – Documentation of PRA Technical Adequacy
- Attachment 3 – Proposed Technical Specification Changes- Mark-Up
- Attachment 4 – Revised Technical Specification Pages- Re-Typed
- Attachment 5 – Proposed Technical Specification Bases Changes
- Attachment 6 – Proposed No Significant Hazards Consideration
- Attachment 7 – TSTF-425 (NUREG-1431) vs. Callaway Plant TS Cross-Reference
- Attachment 8 – List of Commitments

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Attachment 1

Description and Assessment

Description and Assessment

DESCRIPTION AND ASSESSMENT

1.0 DESCRIPTION

The proposed amendment would modify the Technical Specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the adoption of Technical Specification Task Force (TSTF)–425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control-Risk Informed Technical Specification Task Force (RITSTF) Initiative 5." Additionally, the change would add a new program, the Surveillance Frequency Control Program, to TS Section 5, "Administrative Controls". The existing TS Bases information describing the basis for the Surveillance Frequency will be relocated to the licensee-controlled Surveillance Frequency Control Program.

The changes are consistent with NRC approved Industry/TSTF STS change TSTF-425, Revision 3, (ADAMS Accession No. ML090850642). The Federal Register Notice published on July 6, 2009 (74 FR 31996) announced the availability of this TS improvement. Included in the Federal Register Notice was a generic Safety Evaluation intended to be used for processing/approving license amendment requests submitted by licensees choosing to adopt TSTF-425

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

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

Attachment 2 includes AmerenUE documentation with regard to PRA technical adequacy consistent with the requirements of Regulatory Guide 1.200, Revision 1 (ADAMS Accession No. ML070240001), Section 4.2, and describes any PRA models without NRC-endorsed standards, including documentation of the quality characteristics of those models in accordance with Regulatory Guide 1. 200.

AmerenUE has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to Callaway Plant and justify the requested license amendment to incorporate the changes to the Callaway Plant TS.

2.2 Optional Changes and Variations

The proposed amendment is consistent with the Standard Technical Specifications (STS) changes described in TSTF-425, Revision 3, but AmerenUE proposes variations or deviations from TSTF-425, as identified below and may include differing TS Surveillance numbers.

AmerenUE proposes to take an exception to the composition of the Integrated Decision-making Panel (IDP) described in NEI 04-10, Revision 1, in order to allow the use of an Independent Decision-making Panel of qualified individuals with appropriate experience for recommending the acceptability of proposed surveillance frequency changes, in lieu of the site Maintenance Rule Expert Panel. This panel will be comprised of individuals whose experience levels are equal to or exceed the requirements of those on the Maintenance Rule Expert Panel. The individuals who will make up this panel will be designated by the senior management team that provides process oversight. The designated individuals will have expertise in the areas of probabilistic risk assessment, operations, maintenance, engineering, quality assurance, operating experience, and licensing. At least three individuals will have a minimum of 5 years experience at Callaway Plant or similar nuclear plants, and at least one individual will have worked on the modeling and updating of the PRA for Callaway Plant or similar plants for a minimum of 3 years. This level of experience and expertise will ensure that recommendations are well-considered and safety-focused. When developing potential changes, the panel will be augmented by the Surveillance Test Coordinator and at least one subject matter expert on the structure, system or component being evaluated.

The Callaway Plant On-Site Review Committee (ORC) will review probabilistic and deterministic assessments to determine if a sufficient basis exists to support Surveillance Test Interval (STI) change proposals and to approve or disapprove proposed STI changes.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration

AmerenUE has reviewed the proposed no significant hazards consideration determination (NSHC) published in the Federal Register on July 6, 2009 (74 FR 31996) and has concluded that the proposed NSHC presented in the Federal Register notice is applicable to Callaway Plant. As such, the NSHC determination for this amendment request is provided as Attachment 6 to this amendment request which satisfies the requirements of 10 CFR 50.91(a).

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Attachment 2

Documentation of PRA Technical Adequacy

Documentation of PRA Technical Adequacy

Basis to Conclude that the PRA Model Represents the As-Built, As-Operated Plant

Callaway Plant administrative procedure APA-ZZ-00312, "Probabilistic Risk Assessment (PRA)," provides the guidance used for PRA model updates. In accordance with APA-ZZ-00312 and related procedures, plant changes that could impact the PRA model are screened and evaluated. For example, two categories of plant changes that are screened/evaluated are plant modifications and Emergency Operating Procedures. The referenced procedure requires that the PRA model be updated on a minimum frequency, or if a plant configuration change occurs that could significantly impact the PRA model. The objective of the above-described procedural guidance is to assure that the PRA model represents the as-built, as-operated plant. At the present time, no plant changes, that could significantly impact the PRA model, have been implemented which have not been incorporated in the PRA model.

Plant changes requiring PRA model updates that occur during the review phase of this amendment request will be processed as interim updates to Callaway PRA Update 4. One such interim update, i.e., PRA Update 4a, has just recently been completed. It should be noted that the PRA model review findings, addressed in Tables 1 and 2 below, pertain to PRA Update 4 and any interim updates to PRA Update 4, including PRA Update 4a. All interim updates will be incorporated into Update 5 (discussed below) and will be subject to industry peer review in 2011.

Consistency of the Internal Events PRA Model with the ASME PRA Standard

The methodology described in Reference 1 will be used by Callaway Plant for adjustment of selected surveillance test intervals (STIs). Reference 1 specifies that Technical Specification Initiative 5b is a Capability Category II risk-informed application, as defined by the ASME PRA Standard.

In 2006, the Callaway PRA was reviewed by Scientech against the Capability Category II requirements of Reference 2. Table 1, which pertains to the current Callaway PRA, delineates the identified gaps to Capability Category II of the Standard, and provides justification as to why the associated Finding/Observation (F/O) does not preclude or negatively impact implementation of this risk-informed application.

As noted above, the gaps/findings in Table 1 pertain to the current Callaway Plant internal events PRA model of record, i.e., "PRA Update 4a." Callaway is currently upgrading this model. The primary objective of the upgrade activity is to develop an internal events PRA that fully meets Capability Category II of the ASME Standard. The upgraded PRA model ("PRA Update 5") will address each of the Findings/Observations

(F/Os) listed in Table 1, such that sensitivity analyses, to address these F/Os` will not be required when PRA Update 5 is available to support STI extension PRA calculations. During the interim period, i.e., from approval of this license amendment request until the availability of PRA Update 5 (anticipated to be approximately 2Q2011), each of the F/Os (Table 1 of Attachment 2) and F&Os (Table 2 of Attachment 2) to Capability Category II of the Standard will be considered for each STI under evaluation, and, when appropriate, sensitivity studies will be performed to address selected F/Os.

Open Findings from the WOG PRA Peer Review

In addition to the review of the Callaway PRA against the Standard, the results of which are summarized in Table 1a Westinghouse Owners' Group (WOG) PRA Peer Review was conducted on the Callaway PRA in 2000. Five (5) open A and B Facts/Observations (F&Os) remain from that review. These open F&Os, and an assessment of their impact on this application, are summarized in Table 2. Note that these F&Os are being addressed, and will therefore no longer be relevant, in PRA Update 5.

Methodology to be Used to Assess STI Changes

As noted above, the methodology/guidance of Reference 1 will be used to assess STI changes.

Key Assumptions and Approximations

There are no known key assumptions or approximations in the Callaway Plant PRA model, related to surveillance test intervals, which would unduly impact the risk metrics or insights necessary to support an STI change. For each STI change under consideration, however, Callaway Plant PRA personnel will determine if any assumptions or approximations exist in the model, which may impact the PRA calculations, and therefore need to be addressed using sensitivity analyses or other means.

External Events Risk

For the Individual Plant Examination of External Events (IPEEE), Callaway Plant employed EPRI's Seismic Margins Assessment (SMA) and Fire Induced Vulnerability Evaluation (FIVE) methodologies. The NEI guidance (Reference 1) takes these methodologies into account. In cases in which these methodologies cannot be used for an STI change evaluation, qualitative or bounding analyses may be performed. Callaway Plant will follow the NEI guidance to assess the fire and seismic risk associated with STI changes. (Callaway is developing a state-of-the-art Fire PRA to support transition to NFPA 805; however, that model is not yet ready to be used to support STI change evaluations.)

References

1. NEI 04-10, Rev. 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies".

2. ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," with ASME RA-Sa-2003 and ASME RA-Sb-2005 Addenda, ASME, 2005.

Table 1 – Comparison of Callaway Plant PRA Update 4a to Capability Category II

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
Initiating Events				
IE-A4	IE-3	C	No documentation of a system-by-system review for IE potential.	System-by-system review has since been performed and documented. No new IEs were identified. Therefore, there is no impact on the 5b application.
IE-A5	IE-4	C	Non-power events were not evaluated/ addressed in the original IE analysis.	Non-power events have since been addressed. No new IEs were identified. Therefore, there is no impact on the 5b application.
IE-A7	IE-6	B	Callaway Plant OE for IE precursors was not reviewed when originally identifying IEs.	Callaway precursor OE has since been reviewed. No new IEs were identified. Therefore, there is no impact on the 5b application.
IE-C1	IE-7	B	The IE frequencies, through Update 4a, do not have uncertainty bounds assigned.	Updated initiator frequencies, with uncertainty bounds, were developed for Update 5. This information is therefore available, if deemed necessary, for performing the various NEI 04-10 PRA calculations. Gap does therefore not preclude implementation of 5b.
IE-C1a	IE-7	B	See discussion for SR IE-C1.	See discussion for SR IE-C1.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
IE-C1b	IE-8	B	Certain recovery events, in the loss of CCW and loss of SW, are credited, without sufficient analysis or data.	Step 14 of NEI 04-10 provides guidance for sensitivity studies related to recovery of failed components affected by the given STI. Therefore, this gap can be accommodated in STI evaluations, and does not preclude implementation of 5b.
IE-C3	IE-10	C	IE frequencies are not adjusted to account for plant availability.	The IE frequencies generated for Update 5 have been appropriately adjusted to address this gap. These updated frequencies would be available for performing the various NEI 04-10 PRA calculations. This gap does therefore not preclude implementation of 5b. A sensitivity analysis was performed using the loss of offsite power (LOOP) initiating event frequency. (LOOP was selected since, in Update 4, the LOOP initiator has a Fussell-Vesely importance of 0.547.) Using Update 4, the difference in CDF, with the plant availability adjustment applied and not applied to the LOOP frequency, was only 5.6 percent. This represents a relatively low impact on the results, particularly in light of the very high F-V importance of this initiator.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
IE-C9	IE-8	B	See discussion for SR IE-C1b.	See discussion for SR IE-C1b.
IE-C10	IE-12	B	There is no documentation of a comparison of fault tree-generated support system IE frequencies to generic data.	A comparison of all IE frequencies to generic and other plant data was performed and documented for Update 5. No IE frequencies were determined to be outliers as a result of this comparison. This gap does therefore not preclude implementation of 5b
IE-C12	IE-13	B	Identified gap is related to documentation and age of the Interfacing System LOCA (ISLOCA) analysis.	ISLOCA analysis has been redone and documented in support of work for Update 5. If a candidate STI is deemed to impact ISLOCA risk, the updated ISLOCA analysis can be exercised.
IE-C13	IE-7	B	See discussion for SR IE-C1.	See discussion for SR IE-C1.
IE-D1	IE-14	C	Finding is that, while IE documentation is reasonably complete, it is not conducive to performing updates or peer reviews, primarily because the IE documentation resides in a relatively large number of documents. Finding was categorized by review team as a documentation issue.	This gap was deemed by the review team to be a documentation issue. Adequate documentation of the IE analysis does exist. This finding does not preclude implementation of 5b.
IE-D2	IE-14	C	See discussion for SR IE-D1.	See discussion for SR IE-D1.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
IE-D3	IE-14	C	See discussion for SR IE-D1.	See information for SR IE-D1.
Accident Sequence Analysis				
AS-A11	AS-2	B	This finding was based on there being transfer sequences that were quantified with .OCL (i.e., batch quantification) files that were generated manually, and not with a specific event tree. This was deemed to introduce the possibility of errors, although none were found.	The transfer sequences have been extensively reviewed, and no issues have been identified. Therefore, this F/O would not impact or preclude the 5b application.
AS-B1	AS-1, AS-3, AS-5, AS-7	B, B, C, B, respectively	The 4 cited F/Os essentially question whether the impact of certain IEs, on certain mitigation functions credited in event trees (ETs), was correctly captured.	A sensitivity evaluation performed for the previously-approved one-time ESW Completion Time (CT) extension application determined that correction of F/Os AS-1, -3 and -7 would result in only a 1% increase in the Update 4 baseline CDF. (Note also that certain F/O-implied issues were investigated, and could not be verified.) F/O AS-5 suggests re-evaluation of the switchgear room cooling requirements for SBO conditions. It has since been determined that switchgear room cooling is not required for any initiator. Use of the Update 4a model, which requires room cooling, for Initiative 5b, would be conservative. Based on the above discussion, the gap to Capability Category II of SR

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
				AS-B1 would not preclude implementation of Initiative 5b.
AS-B2	AS-1, AS-3, AS-5, AS-7	B, B, C, B, respectively	See discussion for SR AS-B1.	See discussion for SR AS-B1.
AS-B6	AS-4, AS-5	B, C, respectively	AS-4 cites the need to update the RCP seal LOCA model. AS-5 recommends re-evaluating the room cooling requirement for switchgear rooms during SBO.	AS-5 is discussed above for SR AS-B1. Regarding AS-4, the seal LOCA model used in Update 4 is based on an older-vintage Westinghouse Owners' Group study. A previous sensitivity study indicated that baseline CDF would increase by only 1.5 percent when seal LOCA model-related parameters were varied (i.e., increased). Thus, the AS-4 finding would not preclude the 5b application.
Success Criteria				
SC-B5	SC-2	C	No documentation of a check of the reasonableness of success criteria.	The review team deemed this to be a documentation issue. The Callaway Plant success criteria are similar to the Wolf Creek success criteria. (Wolf Creek is essentially the same plant design as Callaway.) During development of the original PRA model, for the IPE, periodic comparisons were made of the Callaway and Wolf Creek PRAs, including

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
				comparisons of success criteria. The Callaway Plant success criteria are also comparable to success criteria for other, similar plants. The technical requirements of this SR are met.
SC-C1	SC-1	C	Success criteria are not documented in a single place.	The review team deemed this to be a documentation issue. Thus, this gap to Capability Category II of the SR would not preclude implementation of the 5b application.
SC-C2	SC-1	C	See discussion for SR SC-C1.	See discussion for SR SC-C1.
SC-C3	SC-1	C	See discussion for SR SC-C1.	See discussion for SR SC-C1.
Systems Analysis				
SY-A7	SY-1	B	Two issues were identified: (1) the dependency of Main Feedwater on instrument air (IA) needs to be included in the model and (2) the applicability of data used for undeveloped events for loss of IA and failure of actuation signals needs to be verified.	To address these issues, a sensitivity analysis was performed. The analysis resulted in only a 0.59 percent increase in the Update 4 baseline CDF.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
SY-A22	IE-8	B	See discussion for SR IE-C1b.	See discussion for SR IE-C1b.
SY-B1	SY-2	B	CCFs are not modeled for battery chargers or breakers. In addition, the quantification of CCF probabilities should be updated.	Battery charger and breaker independent failure events have low Fussel-Vesely importances in PRA Update 4. The F-V importance of CCFs of battery chargers and breakers would also be expected to be relatively low, if these failure modes were modeled. As a sensitivity analysis, battery charger common cause failure events were added to the PRA model, and the model was re-quantified. There was no discernable change in core damage frequency. In fact, all charger CCF events modeled were truncated from the core damage cutset results. (A truncation value of approximately seven (7) orders of magnitude below the baseline CDF is used in the PRA quantification.) A separate sensitivity analysis was performed in which all existing CCF probabilities were increased by 10 percent. The Update 4 baseline CDF increased by only 3.54 percent. It is noted that NEI 04-10 provides guidance for adjustment of CCF probabilities associated with STI change evaluations.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
SY-B3	SY-2	B	See discussion for SR SY-B1.	See discussion for SR SY-B1.
Human Reliability Analysis				
HR-D3	HR-1	C	Suggestion for addition of a "ground rule" statement to HRA documentation.	The review team deemed this finding to be a documentation issue. As such, this finding does not preclude implementation of Initiative 5b. The technical requirements of this SR are met at Capability Category II.
HR-G6	HR-2	C	A reasonableness check of HEPs was performed, but not documented.	The review team deemed this finding to be a documentation issue. As such, this finding does not preclude implementation of Initiative 5b. The technical requirements of this SR are met.
HR-I3	HR-3	C	No documentation of key sources of uncertainty associated with the HRA.	The review team deemed this finding to be a documentation issue. As such, this finding does not preclude implementation of Initiative 5b. It is noted that Steps 5 and 14 of NEI 04-10 address assumptions and sources of uncertainty in the STI evaluation process. Since Callaway will use the NEI guidance for STI evaluations, assumptions and sources of uncertainty, deemed important to a given

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
				STI evaluation, will be addressed.
Data Analysis				
DA-B1	DA-2	B	Only Capability Category I is met with respect to SR DA-B1. (Components were not grouped according to characteristics of their usage.)	The data update task performed for PRA Update 5 grouped components by component type **and** characteristics of their usage (in order to meet Capability Category II of this SR). The resulting groupings had populations that were similar to the groupings that are the subject of this finding. Therefore, this finding would not appreciably impact the results of PRA evaluations performed for an STI change. In addition, updated component failure data, from Update 5, is available to support the required PRA calculations or sensitivity evaluations associated with a given STI change, if deemed necessary.
DA-C2	DA-2	B	See discussion for SR DA-B1.	See discussion for SR DA-B1.
DA-C6	DA-1	C	Documentation of certain data collection is lacking.	The review team deemed this to be a documentation issue. As such, this finding does not preclude implementation of Initiative 5b. The technical requirements of this SR are met.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
DA-C7	DA-1	C	See discussion for SR DA-C6.	See discussion for SR DA-C6.
DA-C8	DA-1	C	See discussion for SR DA-C6.	See discussion for SR DA-C6.
DA-C9	DA-1	C	See discussion for SR DA-C6.	See discussion for SR DA-C6.
DA-C14	IE-8	B	See discussion for SR IE-C1b.	See discussion for SR IE-C1b.
DA-D2	DA-3	C	No justification is provided for the use of engineering judgment to determine the probabilities of HYDRAULIC-SYSFAIL, STR-FS, STR-FR basic events.	The review team deemed this to be a documentation issue. As such, this finding does not preclude implementation of Initiative 5b. A sensitivity analysis was performed in which the probabilities of the HYDRAULICSYSFAIL and all STR basic events were increased by a factor of 2. The PRA Update 4 baseline CDF increased by only 0.03 percent.
Internal Flooding				
IF-C2a	IF-5	B	The SR requires that operator response to floods be based on flood area and flood sources. The Callaway Plant IF analysis, through Update 4a, treats operator response in a generic sense.	NEI 04-10 allows the use of qualitative or bounding analysis to address flood contributors. Since the current Callaway Plant IF analysis is not easily exercised, qualitative or bounding analysis will typically be used to assess flood risk. Thus, this finding does not preclude implementation of Initiative 5b. (Note that, when Update 5 is

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
				completed, the IF analysis will be integrated into the internal events PRA, and can therefore be exercised/run, as required, for STI evaluations.)
IF-C6	IF-3	C	Current Callaway Plant flood area screening credits operator intervention for floods that take >30 mins. Criteria for Capability Category II are not explicitly addressed.	Refer to Gap Disposition discussion for SR IF-C2a. Callaway Plant will typically use qualitative or bounding analysis to address IF contribution to risk, until such time as PRA Update 5 is available.
IF-C8	IF-3	C	See discussion for SR IF-C6.	See discussion for SR IF-C6.
IF-D5	IF-1	C	The flood initiator frequencies are based on generic pipe break frequencies. No plant-specific experience was considered in the determination of flood initiator frequencies.	Since plant-specific experience, at the time of the existing IF analysis, was 0 events, incorporation of plant experience would serve to reduce the IF initiator frequencies. This would lessen the IF contribution to risk for STI changes. Therefore, this gap would not significantly bear on or preclude the 5b application.
IF-D5a	IF-1	C	See discussion for SR IF-D5.	See discussion for SR IF-D5.
IF-E3a	IF-2	B	Standard specifies a CDF screening criterion of 1E-9; existing Callaway Plant IF analysis used 1E-6.	Refer to Gap Disposition discussion for SR IF-C2a. Initially, Callaway Plant will typically use qualitative or bounding analysis to address IF contribution to risk.
IF-E5	IF-4	B	HEPs for operator intervention and mitigation	Refer to Gap Disposition discussion for SR IF-C2a.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
			are not based on HRA, as required by the Standard.	Callaway Plant will typically use qualitative or bounding analyses to address IF contribution to risk, until such time as PRA Update 5 is available.
IF-E5a	IF-4	B	See discussion for SR IF-E5.	See discussion for SR IF-E5.
IF-E7	IF-6	B	The current Callaway Plant LERF analysis does not include internal flooding scenarios.	NEI 04-10 allows the use of qualitative or bounding analysis to address the flooding contribution to core damage and large early release risk. As provided for in the NEI guidance, Callaway Plant will typically use qualitative or bounding analysis to address the flooding contribution to large early release risk, until such time as the Update 5 PRA model is available for use. It is noted that, with the exception of containment bypass scenarios, CDF is typically the limiting risk metric for Callaway Plant PRA applications.
Quantification				
QU-A2b	QU-1	B	Current PRA does not include an uncertainty calculation accounting for the "state-of-knowledge" correlation.	This gap can be addressed, if necessary, when developing the PRA information for a given STI change, as a sensitivity case. (Addressing gaps to the Reg. Guide / PRA Standard using sensitivity studies is consistent with the NEI 04-10 guidance.)

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
QU-B9	QU-2	C	Potential for missed dependencies in SSIEs (support system initiating events).	F/O states that SR QU-B9 is considered to be met. Therefore, this item is not actually a gap to Capability Category II of the Standard. The finding actually represents a recommendation to link SSIE fault trees to the event trees in the quantification process. (In Update 4a, the SSIE fault trees are solved for a frequency, and then this frequency is represented as a basic event in the quantification.) The finding (i.e., recommendation) will be implemented in PRA Update 5.
QU-D4	QU-5	C	No documentation of a review of non-significant sequences or cutsets.	The review team deemed this gap to be a documentation issue. As such, it would not preclude implementation of Initiative 5b. It is noted that all accident sequences have been reviewed via QR (qualified review) of the event trees, regardless of their frequency. In addition, non-significant cutsets have been reviewed from time-to-time, e.g., following a PRA update, or pursuant to applications. Therefore, the actual technical requirements of this SR are met.
QU-E3	QU-1	B	See discussion for SR QU-A2b.	See discussion for SR QU-A2b.

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
QU-F1	QU-8	C	Recommenda-tion to integrate all pieces of the internal events analysis into one quantification process.	When using Update 4a, separate steps are, in fact, required to quantify internal events, internal flooding and/or ISLOCA. However, as long as the contribution to risk from each of these sources can be determined (including the use of qualitative or bounding analysis), there is nothing that would preclude implementation of Initiative 5b.
QU-F2	QU-9	B	Some of the typical QU documentation items cited in the Standard do not exist for Update 4.	The review team deemed this gap to be a documentation issue. As such, it would not preclude implementation of Initiative 5b.
QU-F4	QU-10	B	Key assumptions and key sources of uncertainty "are not addressed in a coherent manner in the documentation."	The review team deemed this finding to be a documentation issue. As such, it would not preclude implementation of Initiative 5b. It is noted that Steps 5 and 14 of NEI 04-10 address assumptions and sources of uncertainty in the STI evaluation process. Since Callaway Plant will use the NEI guidance for STI evaluations, assumptions and sources of uncertainty, deemed important to a given STI evaluation, will be addressed.
QU-F5	QU-12	C	No documentation exists of limitations in the quantification process that would impact applications, per the Standard requirements.	The review team deemed this finding to be a documentation issue. There are no limitations in the quantification process that would impact

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
				implementation of Initiative 5b.
QU-F6	QU-11	B	Update 4 definitions of a significant cutset and significant accident sequence differ from those of the Standard. The Callaway Plant definitions are not justified, as required by the Standard.	The review team deemed this finding to be a documentation issue. As such, it would not preclude implementation of Initiative 5b. It is noted that the relatively minor differences between the Callaway Plant and ASME Standard definitions of significant cutset and significant accident sequence would not be detrimental to application of the guidance in NEI 04-10.
LERF Analysis				
LE-B1	LE-1	B	Some LERF contributors, cited in Table 4.5.9-3 of the Standard, may not be addressed in the current Callaway Plant LERF model.	Experience has shown that, for Callaway Plant (large, dry containment), CDF is the limiting metric for most risk-informed applications, particularly those that do not impact containment bypass risk. For STI evaluations for which LERF is deemed to be potentially important, this finding can be addressed by the conduct of sensitivity studies, performed as part of the PRA calculations required to support the STI change.
LE-D4	LE-3	C	To meet Capability Category II, need to perform a plant-specific analysis of thermally-	The review team deemed this finding to be a "C" significance level, citing little benefit at significant

Supporting Requirement (from Ref. 2) Not Met at Cap. Cat. II	Associated Finding / Observation (F/O) No.	F/O Level of Significance	F/O Description	F/O Disposition for Technical Specifications Initiative 5b
			induced SGTR and secondary side isolation capability.	cost. This finding can be addressed with sensitivity studies, if deemed to be warranted for a specific STI under evaluation.
LE-D5	LE-3	C	See discussion for SR LE-D4.	See discussion for SR LE-D4.
LE-D6	LE-1	B	See discussion for SR LE-B1.	See discussion for SR LE-B1.
LE-F2	LE-2	B	LERF analysis does not include uncertainty or sensitivity analysis.	This finding can be addressed with sensitivity studies, if deemed to be warranted for a specific STI under evaluation.
LE-G4	LE-2	B	See discussion for SR LE-F2.	See discussion for SR LE-F2.

Notes on Table 1:

1. Supporting Requirement numbers based on the 2005 version of the ASME PRA Standard.

2. Definitions of F/O Significance Levels:

   A - Extremely important and necessary to address to assure the technical adequacy of the PRA or the quality of the PRA or the quality of the update process. *(There were no "A" level F/Os.)*

   B – Important and necessary to address, but may be deferred until the next PRA update.

C – Marginal importance, but considered desirable to maintain maximum flexibility in PRA applications and consistency in the industry.

D – Editorial or minor technical item, left to the discretion of the host utility. *(No "D" level F/Os were written.)*

Table 2 – Open A and B Facts/Observations (F&Os) from the WOG PRA Peer Review

F&O No.	Significance Level	F&O Description	F&O Disposition for Technical Specifications Initiative 5b:
Initiating Event			
IE-7	B	Two interfacing system LOCA issues: 1. ISLOCA locations are limited to only those scenarios where containment may be bypassed. 2. The ISLOCA quantification does not correlate variables for basic events using the same failure rate.	As noted in Table 1, the ISLOCA analysis has been redone in support of PRA Update 5. If a given STI change under consideration is deemed to impact ISLOCA risk, the revised ISLOCA model can be exercised to determine the risk impact of the proposed STI change. Further, regarding F&O issue 1, the issue was refuted in the updated ISLOCA analysis (i.e., the finding was deemed not to be valid). Regarding F&O issue 2, as noted for SR QU-A2b, in Table 1, above, this issue can be addressed via a sensitivity case if deemed important for a given STI change under evaluation.
Structural Response			
ST-1	B	The ISLOCA analysis did not use current state of the art analysis to determine probability of low pressure pipe failure upon overpressure, such as the approach indicated in references such as NUREG/CR-5102 or NUREG/CR-5744.	This finding was explicitly addressed in the updated ISLOCA analysis performed in support of PRA Update 5. If an STI change under consideration is deemed to impact ISLOCA risk, the updated ISLOCA analysis will be exercised.
Thermal Hydraulic Analysis			
TH-3	B	Consider preparing success criteria guidance for the PRA, to address such items as overall success criteria definition process, development of success criteria for systems, etc.	This is a documentation issue. No issues were identified with the actual success criteria utilized. Therefore, this F&O does not impact the 5b application.

F&O No.	Significance Level	F&O Description	F&O Disposition for Technical Specifications Initiative 5b:
Containment Performance Analysis			
L2-1	A	Address containment isolation failure and internal floods in the LERF calculation.	This F&O was assigned an "A" level of significance because "LERF is a direct metric for many risk based applications." For any STI changes that are deemed to impact containment isolation or internal flooding, this finding can be addressed with sensitivity analyses, as provided for in the NEI guidance for the 5b application.
L2-3	B	The calculation of LERF is based on containment event tree split fractions. The process simply multiplies the split fractions together, resulting in an overall LERF split fraction for each PDS. It is not obvious how the split fractions are related back to elementary phenomena or system failures.	The Callaway process of using split fractions to partition a PDS to a LERF status is similar to the process used in NUREG/CR-6595. The split fractions are not generally subjected to change due to system failures. Any systems that were credited in accident mitigation (e.g., sprays or containment heat removal) were explicitly modeled, not developed as split fractions. Elementary phenomena (such as direct containment heating due to corium dispersal that is dependent on a plant's cavity design) do not usually change, and thus split fractions do not change. Therefore, this F&O would not impact the PRA results generated for envisioned STI changes. In the unlikely event that an STI change is deemed to impact the split fractions used, this can be addressed by the conduct of sensitivity analyses, as provided for in the NEI guidance for 5b.

ULNRC- 05725
Attachment 3

Proposed Technical Specification Changes - Mark-Up

Mark-Ups are based on amendments approved by NRC through Amendment 200 dated June 29, 2010.

Technical Specification Inserts

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 in the channel required for channel OPERABILITY 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 ---------- INSERT 1 → ~~31 EFPD thereafter~~

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. Tavg ≥ 500°F; and b. All reactor coolant pumps operating.	Prior to reactor criticality after each removal of the reactor head

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Control bank sequence or overlap limits not met.	B.1.1	Verify SDM to be within the limits provided in the COLR.	1 hour
	OR		
	B.1.2	Initiate boration to restore SDM to within limit.	1 hour
	AND		
	B.2	Restore control bank sequence and overlap to within limits.	2 hour
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify estimated critical control bank position is within the limits specified in the COLR.	Within 4 hours prior to achieving criticality
SR 3.1.6.2	Verify each control bank insertion is within the limits specified in the COLR.	~~12 hours~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Perform 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 ≥ 541°F.	~~30 minutes~~ ← INSERT 1
SR 3.1.8.3	Verify THERMAL POWER is ≤ 5% RTP.	~~4 hour~~ ← INSERT 1
SR 3.1.8.4	Verify SDM is within limits provided in the COLR.	~~24 hours~~ ← INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify RCS boron concentration is greater than the ARO critical boron concentration.	~~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 AND Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified AND ~~31 EFPD thereafter~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued)	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which was last verified AND INSERT 1 → ~~31 EFPD thereafter~~

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 INSERT 1 → ~~31 EFPD thereafter~~

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)

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	---------- NOTE ---------- 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 input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP. ---------- Verify QPTR is within limit using 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. ---------- 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 the incore power distribution measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 2%.	INSERT 1 ~~31 effective~~ full ~~power days (EFPD)~~

(continued)

SURVEILLANCE		FREQUENCY
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. INSERT 1 →	~~92 days on a STAGGERED TEST BASIS~~
SR 3.3.1.6	---------- NOTE ---------- Not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 75 % RTP. ---------- Calibrate excore channels to agree with incore power distribution measurements.	INSERT 1 ~~92 EFPD~~
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. Source range instrumentation shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	INSERT 1 ~~184 days~~

(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~~ the frequency specified in the Surveillance Frequency Control Program ---------- 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 →	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	INSERT 1 ~~92 days~~
SR 3.3.1.10	---------- NOTE ---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	INSERT 1 ~~18 months~~
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 ~~18 months~~
SR 3.3.1.12	Not used.	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.13	Perform COT.	~~18 months~~ INSERT 1
SR 3.3.1.14	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	~~18 months~~ INSERT 1
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 ~~18 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	---------- NOTE ---------- The continuity check may be excluded from the BOP ESFAS test. ---------- Perform ACTUATION LOGIC TEST.	INSERT 1 ↓ ~~31 days on a STAGGERED TEST BASIS~~
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~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.6	---------- NOTE ---------- Not applicable to slave relays K602, K620, K622, K624, K630, K740, K741, and K750. ---------- Perform SLAVE RELAY TEST.	INSERT 1 ~~92 days~~
SR 3.3.2.7	---------- NOTE ---------- Verification of relay setpoints not required. ---------- Perform TADOT.	INSERT 1 ~~18 months~~
SR 3.3.2.8	---------- NOTE ---------- Verification of setpoint not required for manual initiation functions. ---------- Perform TADOT.	INSERT 1 ~~18 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 ~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.10	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is ≥ 900 psig. ---------- Verify ESF RESPONSE TIMES are within limits.	INSERT 1 ~~18 months on~~ a ~~STAGGERED TEST BASIS~~
SR 3.3.2.11	---------- NOTE ---------- Verification of setpoint not required. ---------- Perform TADOT.	INSERT 1 ~~18 months~~
SR 3.3.2.12	Perform COT.	~~31 days~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.13	---------- NOTE ---------- Only applicable to slave relays K602, K622, K624, K630, K740, and K741. ---------- Perform SLAVE RELAY TEST.	INSERT 1 ↓ ~~18 months~~ AND Prior to entering MODE 4 when in MODE 5 or 6 > 24 hours, if not performed within the previous 92 days
SR 3.3.2.14	---------- NOTE ---------- Only applicable to slave relays K620 and K750. ---------- Perform SLAVE RELAY TEST.	INSERT 1 ↓ ~~18 months~~ AND Prior to entering MODE 3 when in MODE 5 or 6 > 24 hours, if not performed within the previous 92 days

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.	~~31 days~~
SR 3.3.3.2	NOTE Neutron detectors are excluded from CHANNEL CALIBRATION. Perform CHANNEL CALIBRATION.	Insert 1 ~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~
SR 3.3.4.2	---------- NOTE ---------- Only required to be performed in MODES 1 and 2 for the turbine-driven AFW pump. ---------- Verify each required auxiliary shutdown panel control circuit and transfer switch is capable of performing the intended function.	Insert 1 ~~18 months~~
SR 3.3.4.3	---------- NOTE ---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor trip breaker and RCP breaker position indications are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION for each required instrumentation channel.	Insert 1 ~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.5.1	Tie breakers between 480 Vac buses NG01 and NG03 and between 480 Vac buses NG02 and NG04 shall be verified open.	~~7 days~~
SR 3.3.5.2	---------- NOTE ---------- Verification of time delays is not required. ---------- Perform TADOT.	Insert 1 ~~31 days~~
SR 3.3.5.3	Perform CHANNEL CALIBRATION with nominal Trip Setpoint and Allowable Value as follows: a. Loss of voltage Allowable Value 83 +0, -8.3V (120V Bus) with a time delay of 1.0 + 0.2, -0.5 sec. Loss of voltage nominal Trip Setpoint 83V (120V Bus) with a time delay of 1.0 sec. b. Degraded voltage Allowable Value 107.47 ± 0.38V (120V Bus) with a time delay of 119 ± 11.6 sec. Degraded voltage nominal Trip Setpoint 107.47V (120V Bus) with a time delay of 119 sec.	~~18 months~~ Insert 1
SR 3.3.5.4	Verify LOP DG Start ESF RESPONSE TIMES are within limits.	~~18 months on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.6.2	NOTE The continuity check may be excluded. Perform ACTUATION LOGIC TEST.	Insert 1 31 days on a STAGGERED TEST BASIS
SR 3.3.6.3	Perform COT.	~~92 days~~
SR 3.3.6.4	NOTE Verification of setpoint is not required. Perform TADOT.	Insert 1 ~~18 months~~
SR 3.3.6.5	Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1
SR 3.3.6.6	Verify Containment Purge Isolation ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.7.2	Perform COT.	~~92 days~~ Insert 1
SR 3.3.7.3	NOTE The continuity check may be excluded. Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.7.4	NOTE Verification of setpoint is not required. Perform TADOT.	~~18 months~~
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1
SR 3.3.7.6	NOTE Radiation monitor detectors are excluded from response time testing. Verify Control Room Ventilation Isolation ESF RESPONSE TIMES are within limits	18 months on a STAGGERED TEST BASIS

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.8.2	Perform COT.	~~92 days~~ Insert 1
SR 3.3.8.3	NOTE The continuity check may be excluded. Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.8.4	NOTE Verification of setpoint is not required. Perform TADOT.	Insert 1 ~~18 months~~
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.9.2	---------- NOTE ---------- Only required to be performed in MODE 5. ---------- Verify BGV0178 is secured in the closed position.	Insert 1 ~~31 days~~
SR 3.3.9.3	---------- NOTE ---------- Not required to be performed until 4 hours after reducing power below P-6 interlock. ---------- Perform COT and verify nominal flux multiplication setpoint of 1.7.	~~184 days~~
SR 3.3.9.4	---------- NOTE ---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	Insert 1 ~~18 months~~
SR 3.3.9.5	Verify the centrifugal charging pump suction valves from the RWST open and the CVCS volume control tank discharge valves close in less than or equal to 30 seconds on a simulated or actual actuation signal.	~~18 months~~ Insert 1
SR 3.3.9.6	Verify one RCS loop is in operation.	~~12 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~~ INSERT 1
SR 3.4.1.2	Verify RCS average temperature is less than or equal to the limit specified in the COLR.	~~12 hours~~ INSERT 1
SR 3.4.1.3	Verify RCS total flow rate is ≥ 382,630 gpm.	~~12 hours~~ INSERT 1
SR 3.4.1.4	---------- NOTE ---------- Calculated rather than verified by precision heat balance when performed prior to THERMAL POWER exceeding 75% RTP. ---------- Verify by precision heat balance that RCS total flow rate is ≥ 382,630 gpm.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND ~~18 months~~

INSERT 1

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each operating RCS loop average temperature (T_{avg}) shall be ≥ 551°F.

APPLICABILITY: MODE 1,
MODE 2 with k_{eff} ≥ 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 ≥ 551°F.	~~12 hours~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ---------- NOTE ---------- Required Action C.2 shall be completed whenever this Condition is entered. ----------	C.1	Initiate action to restore parameter(s) to within limits.	Immediately
	AND		
Requirements of LCO not met any time in other than MODE 1, 2, 3, or 4.	C.2	Determine RCS is acceptable for continued operation.	Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loops are in operation.	~~12 hours~~ INSERT 1
SR 3.4.5.2	Verify steam generator secondary side narrow range water levels are ≥ 7% for required RCS loops.	~~12 hours~~ INSERT 1
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. Required loops inoperable. OR No RCS or RHR loop in operation.	B.1	Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.	Immediately
	AND		
	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~~ INSERT 1
SR 3.4.6.2	Verify SG secondary side narrow range water levels are ≥ 7% for required RCS loops.	~~12 hours~~ INSERT 1
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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	~~12 hours~~ INSERT 1
SR 3.4.7.2	Verify SG secondary side wide range water level is ≥ 86% in required SGs.	~~12 hours~~ INSERT 1
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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required RHR loops inoperable. OR No RHR loop in operation.	B.1	Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.	Immediately
	AND		
	B.2	Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one RHR loop is in operation.	~~12 hours~~ INSERT 1
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

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is ≤ 92%.	~~12 hours~~ INSERT 1
SR 3.4.9.2	Verify capacity of each required group of backup pressurizer heaters is ≥ 150 kW.	~~18 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.	f Insert 1 ~~92 days~~
SR 3.4.11.2	Perform a complete cycle of each PORV.	In accordance with the Inservice Testing Program

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~~
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~~
SR 3.4.12.4	Verify RHR suction isolation valves are open for each required RHR suction relief valve.	~~72 hours~~
SR 3.4.12.5	Verify required RCS vent ≥ 2.0 square inches open.	~~12 hours for vent~~ pathway(s) not locked, sealed, or otherwise secured in the open position Insert 1 → AND 31 days for vent valve(s) locked, sealed, or otherwise secured in the open position

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	~~72 hours~~ INSERT 1
SR 3.4.12.7	Not used.	
SR 3.4.12.8	---------- NOTE ---------- Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to ≤ 275°F. ---------- Perform a COT on each required PORV, excluding actuation.	INSERT 1 ~~31 days~~
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	~~18 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.	Insert 1 ~~72 hours~~
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.	Insert 1 ~~72 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 18 months~~ AND AND INSERT 1 Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more and if leakage testing has not been performed in the previous 9 months AND Within 24 hours following check valve actuation due to flow through the valve

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.14.2	Verify RHR suction isolation valve interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ 425 psig except when the valves are open to satisfy LCO 3.4.12.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate radioactivity monitor.	~~12 hours~~ INSERT 1
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate radioactivity monitor.	~~92 days~~ INSERT 1
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump level and flow monitoring system.	~~18 months~~ INSERT 1
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate radioactivity monitor.	~~18 months~~ INSERT 1
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment cooler condensate monitoring system.	~~18 months~~ INSERT 1

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	---------- NOTE ---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 225 μCi/gm.	INSERT 1 ~~7 days~~
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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	~~12 hours~~ INSERT 1
SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ 6061 gallons and ≤ 6655 gallons.	~~12 hours~~ INSERT 1
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 602 psig and ≤ 648 psig.	~~12 hours~~ INSERT 1
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2300 ppm and ≤ 2500 ppm.	~~31 days~~ INSERT 1 AND ------- NOTE -------- Only required to be performed for affected accumulators ---------- Once within 6 hours after each solution volume increase of ≥ 70 gallons 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. Number / Position / Function BNHV8813 / Open / Safety Injection to RWST Isolation Valve EMHV8802A / Closed / SI Hot Legs 2 & 3 Isolation Valve EMHV8802B / Closed / SI Hot Legs 1 & 4 Isolation Valve EMHV8835 / Open / Safety Injection Cold Leg Isolation Valve EJHV8840 / Closed / RHR/SI Hot Leg Recirc Isolation Valve EJHV8809A / Open / RHR to Accum Inject Loops 1 & 2 Isolation Valve EJHV8809B / Open / RHR to Accum Inject Loops 3 & 4 Isolation Valve	~~12 hours~~ INSERT 1
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. INSERT 1 →	~~31 days~~
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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ INSERT 1
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	~~18 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. Valve Number EMV0095 EMV0107 EMV0089 EMV0096 EMV0108 EMV0090 EMV0097 EMV0109 EMV0091 EMV0098 EMV0110 EMV0092	~~18 months~~ INSERT 1
SR 3.5.2.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet strainers show no evidence of structural distress or abnormal corrosion.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	---------- NOTE ---------- Only required to be performed when ambient air temperature is < 37°F or > 100°F. ---------- Verify RWST borated water temperature is ≥ 37°F and ≤ 100°F.	INSERT 1 ~~24 hours~~
SR 3.5.4.2	Verify RWST borated water volume is ≥ 394,000 gallons.	~~7 days~~ INSERT 1
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2350 ppm and ≤ 2500 ppm.	~~7 days~~ INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	---------- NOTE ---------- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig. ---------- Verify manual seal injection throttle valves are adjusted to give a flow within the limits of Figure 3.5.5-1.	INSERT 1 ~~18 months~~

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	Verify each containment shutdown purge valve is sealed closed or closed and blind flange installed except for one purge valve in a penetration flow path while in Condition D of this LCO. INSERT 1	~~Once per 31 days for isolation devices outside containment~~ AND Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment
SR 3.6.3.2	Verify each containment mini-purge valve is closed, except when the containment mini-purge 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.	INSERT 1 ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.4	---------- NOTE ---------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ---------- Verify each containment isolation manual valve 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	---------- NOTE ---------- Only required to be performed when containment shutdown purge valve blind flanges are installed. ---------- Perform leakage rate testing for containment shutdown purge valves with resilient seals and associated blind flanges.	{INSERT 1 ~~24 months~~ AND Following each reinstallation of the blind flange

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.7	---------- NOTE ---------- Only required to be performed for the containment shutdown purge valves when associated blind flanges are removed. ---------- Perform leakage rate testing for containment mini-purge and shutdown purge valves with resilient seals.	INSERT 1 ~~184 days~~ AND 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.	~~18 months~~ INSERT 1

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -0.3 psig and ≤ + 1.5 psig.

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

ACTIONS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours
E. Two containment spray trains inoperable. OR Two containment cooling trains inoperable.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.3	Verify each containment cooling train cooling water flow rate is ≥ 2200 gpm.	~~31 days~~ INSERT 1
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ INSERT 1
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ INSERT 1
SR 3.6.6.7	Verify each containment cooling train starts automatically and minimum cooling water flow rate is established on an actual or simulated actuation signal.	~~18 months~~ INSERT 1
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	~~10 years~~ INSERT 1

3.6 CONTAINMENT SYSTEMS

3.6.7 Recirculation Fluid pH Control (RFPC) System

LCO 3.6.7 The RFPC System shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RFPC System inoperable.	A.1	Restore RFPC System to OPERABLE status.	72 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.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify the integrity of the RFPC System.	~~18 months~~ INSERT 1
SR 3.6.7.2	Verify the RFPC System ensures an equilibrium sump pH ≥ 7.1.	~~18 months~~ INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.2.2	Verify each MSIV, each MSIVBV, and each MSLPDIV actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.7.2.3	Verify isolation time of each MSIVBV and MSLPDIV is within limits.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.3.1	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. Verify the closure time of each MFRV and MFRVBV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.3.2	---------- NOTE ---------- For the MFRVs and MFRVBVs, only required to be performed in MODES 1 and 2. Verify each MFIV, MFRV and MFRVBV actuates to the isolation position on an actual or simulated actuation signal.	Insert 1 ~~18 months~~
SR 3.7.3.3	Verify the closure time of each MFIV is within limits.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	---------- NOTE ---------- Only required to be performed for the AFW flow control valves when the system is placed in automatic control or when THERMAL POWER is > 10% RTP. ---------- 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 ≥ 900 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	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.	~~18 months~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.4	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 psig in the steam generator. ---------- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.7.5.5	Verify proper alignment of the required AFW flow paths by verifying flow from the condensate storage tank to each steam generator.	Prior to entering MODE 2 whenever unit has been in MODE 5 or 6 for > 30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST contained water volume is ≥ 281,000 gal.	~~12 hours~~ Inert!

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.	~~31 days~~ Insert 1
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	---------- NOTE ---------- Isolation of ESW flow to individual components does not render the ESW inoperable. ---------- Verify each ESW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ Insert 1
SR 3.7.8.2	Verify each ESW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.7.8.3	Verify each ESW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of UHS is ≥ 831.25 ft mean sea level.	~~24 hours~~
SR 3.7.9.2	Verify average water temperature of UHS is ≤ 90°F.	~~24 hours~~
SR 3.7.9.3	Operate each cooling tower fan for ≥ 15 minutes in both the fast and slow speed.	~~31 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CREVS train pressurization filter unit for ≥ 10 continuous hours with the heaters operating and each CREVS train filtration filter unit for ≥ 15 minutes.	~~31 days~~ Insert 1
SR 3.7.10.2	Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3	Verify each CREVS train actuates on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.7.10.4	Perform required unfiltered air inleakage testing of the CRE and CBE boundaries in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CRACS train has the capability to remove the assumed heat load.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each EES train for ≥ 10 continuous hours with the heaters operating.	~~31 days~~ Insert 1
SR 3.7.13.2	Perform required EES filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.13.3	Verify each EES train actuates on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.7.13.4	Verify one EES train can maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure in the auxiliary building during the SIS mode of operation.	18 months on a STAGGERED TEST BASIS Insert 1
SR 3.7.13.5	Verify one EES train can maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure in the fuel building during the FBVIS mode of operation.	18 months on a STAGGERED TEST BASIS

3.7 PLANT SYSTEMS

3.7.15 Fuel Storage Pool Water Level

LCO 3.7.15 The fuel storage pool water level shall be ≥ 23 ft over the top of the storage racks.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the fuel storage pool water level is ≥ 23 ft above the storage racks.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool boron concentration is within limit.	~~7 days~~ 9 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.	6 hours
	AND		
	A.2	Be in MODE 5.	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~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. Required Action and associated Completion Time of Condition A, B, C, D, E, or F not met.	G.1	Be in MODE 3.	6 hours
	AND		
	G.2	Be in MODE 5.	36 hours
H. Three or more AC sources inoperable.	H.1	Enter LCO 3.0.3.	Immediately

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. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. ---------- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	INSERT 1 ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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 ≥ 5580 kW and ≤ 6201 kW.	INSERT 1 ~~31 days~~
SR 3.8.1.4	Verify each fuel oil transfer pump starts on low level in the associated day tank standpipe.	~~31 days~~ INSERT 1
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	~~31 days~~ INSERT 1
SR 3.8.1.6	Verify each fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.	~~31 days~~ INSERT 1

(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 in ≤ 12 seconds, voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~ INSERT 1
SR 3.8.1.8	Not used.	
SR 3.8.1.9	Not used.	
SR 3.8.1.10	Verify each DG operating at a power factor ≤ 0.9 and ≥ 0.8 does not trip and voltage is maintained ≤ 4784 V and frequency is maintained ≤ 65.4 Hz during and following a load rejection of ≥ 5580 kW and ≤ 6201 kW.	~~18 months~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	---------- NOTES ---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not 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 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 ≤ 12 seconds, 2. energizes auto-connected shutdown loads through the shutdown load sequencer, 3. maintains steady state voltage ≥ 3740 V and ≤ 4320 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	~~18 months~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	---------- NOTES ---------- 1. All DG starts may be preceded by 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 ≤ 12 seconds after auto-start and during tests, achieves voltage ≥ 3740 V and ≤ 4320 V; b. In ≤ 12 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 remain energized from the offsite power system; and e. Emergency loads are auto-connected and energized through the LOCA load sequencer from the offsite power system.	~~18 months~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated safety injection signal except: a. Engine overspeed; b. Generator differential current; c. Low lube oil pressure; d. High crankcase pressure; e. Start failure relay; and f. High jacket coolant temperature.	~~18 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. 2. The DG may be loaded to ≥ 5580 kW and ≤ 6201 kW for the entire test period if auto-connected design loads are less than 6201 kW. ---------- Verify each DG operating at a power factor ≤ 0.9 and ≥ 0.8 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 6600 kW and ≤ 6821 kW; and b. For the remaining hours of the test loaded ≥ 5580 kW and ≤ 6201 kW.	~~18 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 ≥ 5580 kW and ≤ 6201 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, in ≤ 12 seconds, voltage ≥ 3740 V, and ≤ 4320 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~18 months~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	~~18 months~~ INSERT 1
SR 3.8.1.17	---------- NOTE ---------- 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, 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. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	~~18 months~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.18	---------- NOTE ---------- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify interval between each sequenced load block is within ± 10% of design interval for each LOCA and shutdown load sequencer.	~~18 months~~ INSERT 1
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 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 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 ≤ 12 seconds, 2. energizes auto-connected emergency loads through LOCA load sequencer, 3. achieves steady state voltage ≥ 3740 V and ≤ 4320 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and	~~18 months~~ INSERT 1 (continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.19 (continued)	5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	
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, in ≤ 12 seconds, voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	INSERT 1 ~~10 years~~
SR 3.8.1.21	---------- NOTE ---------- The continuity check may be excluded from the actuation logic test. ---------- Perform ACTUATION LOGIC TEST for each train of the load shedder and emergency load sequencer.	INSERT 1 ~~31 days on a STAGGERED TEST BASIS~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ 80,900 gal of fuel.	~~31 days~~
SR 3.8.3.2	Verify lubricating oil inventory is ≥ 750 gal.	~~31 days~~
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify pressure in two starting air receivers is ≥ 435 psig or pressure in one starting air receiver is ≥ 610 psig, for each DG starting air subsystem.	~~31 days~~
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~31 days~~
SR 3.8.3.6	Not used.	

Insert 1

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One DC electrical power subsystem inoperable.	A.1	Restore DC electrical power subsystem to OPERABLE status.	2 hours
B. Require 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 3.8.4.1	Verify battery terminal voltage is ≥ 130.2 V on float charge.	~~7 days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 69E-6 ohm for cell to cell connections and ≤ 69E-6 ohm for terminal connections.	~~92 days~~
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	~~18 months~~ ← Insert 1
SR 3.8.4.4	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	~~18 months~~
SR 3.8.4.5	Verify battery connection resistance is ≤ 69E-6 ohm for cell to cell connections, and ≤ 69E-6 ohm for terminal connections.	~~18 months~~
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps at ≥ 130.2 V for ≥ 1 hour.	~~18 months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.7	---------- NOTES ---------- 1. The modified performance discharge test in SR 3.8.4.8 may be performed in lieu of the service test in SR 3.8.4.7. 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.	~~18 months~~ Insert 1
SR 3.8.4.8	---------- 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 18 months when battery shows degradation or has reached 85% of expected life

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR One or more batteries with average electrolyte temperature of the representative cells < 60 °F. OR One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

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

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	~~92 days~~ AND Once within 7 days after a battery discharge < 110 V AND Once within 7 days after a battery overcharge > 150 V
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F.	~~92 days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, and alignment to required AC vital buses.	~~7 days~~ Insert 1

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required inverters inoperable. (continued)	A.2.3	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND		
	A.2.4	Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One DC electrical power distribution subsystem inoperable.	C.1	Restore DC electrical power distribution subsystem to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time not met.	D.1 AND D.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
E. Two trains with inoperable distribution subsystems that result in a loss of safety function.	E.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution subsystems inoperable. (continued)	A.2.3	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND		
	A.2.4	Initiate actions to restore required AC, DC, and AC 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 AC vital bus electrical power distribution subsystems.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Verify each valve that isolates unborated water sources is secured in the closed position.	~~31 days~~

Insert 1

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 ~~18 months~~

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	---------- NOTE ---------- Only required for an open equipment hatch. ---------- Verify the capability to install the equipment hatch.	Insert 1 ~~7 days~~
SR 3.9.4.3	Verify each required containment purge isolation valve actuates to the isolation position on a manual actuation signal.	~~18 months~~ Insert 1

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RHR loop requirements not met. (continued)	A.3	Initiate action to satisfy RHR loop requirements.	Immediately
	AND		
	A.4	Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 1000 gpm.	~~12 hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. No RHR loop in operation.	B.1	Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet the boron concentration of LCO 3.9.1.	Immediately
	AND		
	B.2	Initiate action to restore one RHR loop to operation.	Immediately
	AND		
	B.3	Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify one RHR loop is in operation and circulating reactor coolant at a flow rate of ≥ 1000 gpm.	~~12 hours~~ 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 Pool Water Level

LCO 3.9.7 Refueling pool 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 pool 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 pool water level is ≥ 23 ft above the top of reactor vessel flange.	~~24 hours~~ Insert 1

5.5 Programs and Manuals

5.5.17 Control Room Envelope Habitability Program (continued)

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

INSERT 2

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

ULNRC- 05725
Attachment 4

Revised Technical Specification Pages - Re-Typed

Re-typed pages are based on amendments approved by NRC through Amendment 200 dated June 29, 2010.

1.1 Definitions (continued)

SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing all slave relays in the channel required for channel OPERABILITY 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~~ In accordance with the Surveillance Frequency Control Program

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~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual rod positions within alignment limit.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program
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. Tavg ≥ 500°F; and b. All reactor coolant pumps operating.	Prior to reactor criticality after each removal of the reactor head

SURVEILLANCE REQUIREMENTS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Control bank sequence or overlap limits not met.	B.1.1	Verify SDM to be within the limits provided in the COLR.	1 hour
	OR		
	B.1.2	Initiate boration to restore SDM to within limit.	1 hour
	AND		
	B.2	Restore control bank sequence and overlap to within limits.	2 hour
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY (continued)
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~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Perform 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 ≥ 541°F.	~~30 minutes~~ In accordance with the Surveillance Frequency Control Program
SR 3.1.8.3	Verify THERMAL POWER is ≤ 5% RTP.	~~1 hour~~ In accordance with the Surveillance Frequency Control Program

SR 3.1.8.4	Verify SDM is within limits provided in the COLR.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Verify RCS boron concentration is greater than the ARO critical boron concentration.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program

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 AND Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified AND ~~31 EFPD thereafter~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued)	Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which was last verified AND ~~31 EFPD thereafter~~ In accordance with the Surveillance Frequency Control Program

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~~ In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD) (Relaxed Axial Offset Control (RAOC) Methodology)

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~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	---------- NOTE ---------- 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.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.2.4.2	---------- NOTE ---------- Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP. ---------- Verify QPTR is within limit using power distribution measurement information.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2	---------- NOTE ---------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% 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~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.1.3	---------- NOTE ---------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. ---------- Compare results of the incore power distribution measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 2%.	~~31 effective full power days (EFPD)~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE		FREQUENCY
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.	~~62 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.1.6	---------- NOTE ---------- Not required to be performed until 72 hours after achieving equilibrium conditions with THERMAL POWER ≥ 75 % RTP. ---------- Calibrate excore channels to agree with incore power distribution measurements.	~~92 EFPD~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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. Source range instrumentation shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	~~184 days~~ In accordance with the Surveillance Frequency Control Program

(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. ----------	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
Perform COT.	------- NOTE -------- Only required when not performed within the Frequency specified in the Surveillance Frequency Control Program ~~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~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.1.10	---------- NOTE ---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
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 $\geq$ 95% RTP. ---------- Perform CHANNEL CALIBRATION	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.3.1.13	Perform COT.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.1.14	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
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.	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	~~92 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.3	---------- NOTE ---------- The continuity check may be excluded from the BOP ESFAS test. ---------- Perform ACTUATION LOGIC TEST.	~~31 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.4	Perform MASTER RELAY TEST.	~~92 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.5	Perform COT.	~~184 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.6	---------- NOTE ---------- Not applicable to slave relays K602, K620, K622, K624, K630, K740, K741, and K750. ---------- Perform SLAVE RELAY TEST.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.7	---------- NOTE ---------- Verification of relay setpoints not required. ---------- Perform TADOT.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.8	---------- NOTE ---------- Verification of setpoint not required for manual initiation functions. ---------- Perform TADOT.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.9	---------- NOTE ---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ----------	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.10	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is ≥ 900 psig. ---------- Verify ESF RESPONSE TIMES are within limits.	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.11	---------- NOTE ---------- Verification of setpoint not required. ---------- Perform TADOT.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.2.12	Perform COT.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.13	---------- NOTE ---------- Only applicable to slave relays K602, K622, K624, K630, K740, and K741. ---------- Perform SLAVE RELAY TEST.	~~18 months~~ In accordance with the Surveillance Frequency Control Program <u>AND</u> Prior to entering MODE 4 when in MODE 5 or 6 > 24 hours, if not performed within the previous 92 days
SR 3.3.2.14	---------- NOTE ---------- Only applicable to slave relays K620 and K750. ---------- Perform SLAVE RELAY TEST.	~~18 months~~ In accordance with the Surveillance Frequency Control Program <u>AND</u> Prior to entering MODE 3 when in MODE 5 or 6 > 24 hours, if not performed within the previous 92 days

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.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.3.2	---------- NOTE ---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	 ~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.4.2	---------- NOTE ---------- Only required to be performed in MODES 1 and 2 for the turbine-driven AFW pump. ---------- Verify each required auxiliary shutdown panel control circuit and transfer switch is capable of performing the intended function.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.4.3	---------- NOTE ---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor trip breaker and RCP breaker position indications are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Tie breakers between 480 Vac buses NG01 and NG03 and between 480 Vac buses NG02 and NG04 shall be verified open.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.5.2	---------- NOTE ---------- Verification of time delays is not required. ---------- Perform TADOT.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3	Perform CHANNEL CALIBRATION with nominal Trip Setpoint and Allowable Value as follows: a. Loss of voltage Allowable Value 83 +0, -8.3V (120V Bus) with a time delay of 1.0 + 0.2, -0.5 sec. Loss of voltage nominal Trip Setpoint 83V (120V Bus) with a time delay of 1.0 sec. b. Degraded voltage Allowable Value 107.47 ± 0.38V (120V Bus) with a time delay of 119 ± 11.6 sec. Degraded voltage nominal Trip Setpoint 107.47V (120V Bus) with a time delay of 119 sec.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.3.5.4	Verify LOP DG Start ESF RESPONSE TIMES are within limits.	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.6.2	---------- NOTE ---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	 ~~31 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.6.3	Perform COT.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.6.4	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	 ~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.3.6.5	Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.6.6	Verify Containment Purge Isolation ESF RESPONSE TIMES are within limits.	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

	SURVEILLANCE	FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.7.2	Perform COT.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.7.3	---------- NOTE ---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	~~31 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.7.4	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

	SURVEILLANCE	FREQUENCY
SR 3.3.7.6	---------- NOTE ---------- Radiation monitor detectors are excluded from response time testing. ----------	
	Verify Control Room Ventilation Isolation ESF RESPONSE TIMES are within limits	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2	Perform COT.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.8.3	---------- NOTE ---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	~~31 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.8.4	---------- NOTE ---------- Verification of setpoint is not required. ---------- Perform TADOT.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.9.2	---------- NOTE ---------- Only required to be performed in MODE 5. ---------- Verify BGV0178 is secured in the closed position.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.9.3	---------- NOTE ---------- Not required to be performed until 4 hours after reducing power below P-6 interlock. ---------- Perform COT and verify nominal flux multiplication setpoint of 1.7.	~~184 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.9.4	---------- NOTE ---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.3.9.5	Verify the centrifugal charging pump suction valves from the RWST open and the CVCS volume control tank discharge valves close in less than or equal to 30 seconds on a simulated or actual actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.3.9.6	Verify one RCS loop is in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

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~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.1.2	Verify RCS average temperature is less than or equal to the limit specified in the COLR.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.1.3	Verify RCS total flow rate is ≥ 382,630 gpm.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.1.4	---------- NOTE ---------- Calculated rather than verified by precision heat balance when performed prior to THERMAL POWER exceeding 75% RTP. ----------	

	Verify by precision heat balance that RCS total flow rate is ≥ 382,630 gpm.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND ~~18 months~~ In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each operating RCS loop average temperature (T_{avg}) shall be ≥ 551°F.

APPLICABILITY: MODE 1,
MODE 2 with k_{eff} ≥ 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 ≥ 551°F.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ---------- NOTE ---------- Required Action C.2 shall be completed whenever this Condition is entered. ----------	C.1	Initiate action to restore parameter(s) to within limits.	Immediately
	AND		
Requirements of LCO not met any time in other than MODE 1, 2, 3, or 4.	C.2	Determine RCS is acceptable for continued operation.	Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops - MODES 1 and 2

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

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loops are in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.5.2	Verify steam generator secondary side narrow range water levels are ≥ 7% for required RCS loops.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify one RHR or RCS loop is in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.6.2	Verify SG secondary side narrow range water levels are ≥ 7% for required RCS loops.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.7.2	Verify SG secondary side wide range water level is ≥ 86% in required SGs.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required RHR loops inoperable. OR No RHR loop in operation.	B.1	Suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SDM of LCO 3.1.1.	Immediately
	AND		
	B.2	Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one RHR loop is in operation.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is ≤ 92%.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.9.2	Verify capacity of each required group of backup pressurizer heaters is ≥ 150 kW.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

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~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.11.2	Perform a complete cycle of each PORV.	In accordance with the Inservice Testing Program

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~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.12.2	Verify a maximum of one centrifugal charging pump is capable of injecting into the RCS.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.12.4	Verify RHR suction isolation valves are open for each required RHR suction relief valve.	~~72 hours~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.5	Verify required RCS vent ≥ 2.0 square inches open.	~~12 hours for vent pathway(s) not locked, sealed, or otherwise secured in the open position~~ In accordance with the Surveillance Frequency Control Program ~~AND~~ ~~31 days for vent valve(s) locked, sealed, or otherwise secured in the open position~~

(continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.6	Verify PORV block valve is open for each required PORV.	~~72 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.12.7	Not used.	
SR 3.4.12.8	---------- NOTE ---------- Not required to be performed until 12 hours after decreasing any RCS cold leg temperature to ≤ 275°F. ---------- Perform a COT on each required PORV, excluding actuation.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.12.9	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	---------- NOTES ---------- 1. 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. ----------	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2215 psig and ≤ 2255 psig.	In accordance with the Inservice Testing Program~~, and 18 months~~ AND In accordance with the Surveillance Frequency Control Program AND Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more and if leakage testing has not been performed in the previous 9 months AND Within 24 hours following check valve actuation due to flow through the valve

(continued)

SURVEILLANCE		FREQUENCY
SR 3.4.14.2	Verify RHR suction isolation valve interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ 425 psig except when the valves are open to satisfy LCO 3.4.12.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere particulate radioactivity monitor.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform COT of the required containment atmosphere particulate radioactivity monitor.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump level and flow monitoring system.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere particulate radioactivity monitor.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment cooler condensate monitoring system.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	---------- NOTE ---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 225 μCi/gm.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.4.16.2	---------- NOTE ---------- Only required to be performed in MODE 1. ----------	

SURVEILLANCE	FREQUENCY
Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	~~14 days~~ In accordance with the Surveillance Frequency Control Program AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ 6061 gallons and ≤ 6655 gallons.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 602 psig and ≤ 648 psig.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2300 ppm and ≤ 2500 ppm.	~~31 days~~ In accordance with the Surveillance Frequency Control Program AND ------- NOTE -------- Only required to be performed for affected accumulators ---------- Once within 6 hours after each solution volume increase of ≥ 70 gallons 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~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed. Number / Position / Function BNHV8813 / Open / Safety Injection to RWST Isolation Valve EMHV8802A / Closed / SI Hot Legs 2 & 3 Isolation Valve EMHV8802B / Closed / SI Hot Legs 1 & 4 Isolation Valve EMHV8835 / Open / Safety Injection Cold Leg Isolation Valve EJHV8840 / Closed / RHR/SI Hot Leg Recirc Isolation Valve EJHV8809A / Open / RHR to Accum Inject Loops 1 & 2 Isolation Valve EJHV8809B / Open / RHR to Accum Inject Loops 3 & 4 Isolation Valve	~~12 hours~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify ECCS piping is full of water.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Verify, for each ECCS throttle valve listed below, each mechanical position stop is in the correct position. Valve Number EMV0095 EMV0107 EMV0089 EMV0096 EMV0108 EMV0090 EMV0097 EMV0109 EMV0091 EMV0098 EMV0110 EMV0092	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.2.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet strainers show no evidence of structural distress or abnormal corrosion.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	---------- NOTE ---------- Only required to be performed when ambient air temperature is < 37°F or > 100°F. ---------- Verify RWST borated water temperature is ≥ 37°F and ≤ 100°F.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.4.2	Verify RWST borated water volume is ≥ 394,000 gallons.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2350 ppm and ≤ 2500 ppm.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	---------- NOTE ---------- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig. ---------- Verify manual seal injection throttle valves are adjusted to give a flow within the limits of Figure 3.5.5-1.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1	Verify each containment shutdown purge valve is sealed closed or closed and blind flange installed except for one purge valve in a penetration flow path while in Condition D of this LCO.	~~Once per 31 days~~ In accordance with the Surveillance Frequency Control Program for isolation devices outside containment AND Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment
SR 3.6.3.2	Verify each containment mini-purge valve is closed, except when the containment mini-purge 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~~ In accordance with the Surveillance Frequency Control Program
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~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.4	---------- NOTE ---------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ---------- Verify each containment isolation manual valve 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	---------- NOTE ---------- Only required to be performed when containment shutdown purge valve blind flanges are installed. ---------- Perform leakage rate testing for containment shutdown purge valves with resilient seals and associated blind flanges.	~~24 months~~ In accordance with the Surveillance Frequency Control Program AND Following each reinstallation of the blind flange

(continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.7	---------- NOTE ---------- Only required to be performed for the containment shutdown purge valves when associated blind flanges are removed. ---------- Perform leakage rate testing for containment mini-purge and shutdown purge valves with resilient seals.	~~184 days~~ In accordance with the Surveillance Frequency Control Program AND 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.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -0.3 psig and ≤ + 1.5 psig.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment pressure not within limits.	A.1	Restore containment pressure to within limits.	1 hour
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	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~~ In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

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

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment average air temperature not within limit.	A.1	Restore containment average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	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~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours
E. Two containment spray trains inoperable. OR Two containment cooling trains inoperable.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 5.	36 hours

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~~ In accordance with the Surveillance Frequency Control Program
SR 3.6.6.2	Operate each containment cooling train fan unit for ≥ 15 minutes.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.3	Verify each containment cooling train cooling water flow rate is ≥ 2200 gpm.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.6.6.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.6.6.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.6.6.7	Verify each containment cooling train starts automatically and minimum cooling water flow rate is established on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE		FREQUENCY
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	~~10 years~~ In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RFPC System inoperable.	A.1	Restore RFPC System to OPERABLE status.	72 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.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify the integrity of the RFPC System.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.6.7.2	Verify the RFPC System ensures an equilibrium sump pH ≥ 7.1.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	Verify isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.2.2	Verify each MSIV, each MSIVBV, and each MSLPDIV actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.2.3	Verify isolation time ofeach MSIVBV and MSLPDIV is within limits.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	---------- NOTE ---------- Only required to be performed in MODES 1 and 2. ---------- Verify the closure time of each MFRV and MFRVBV is within limits.	In accordance with the Inservice Testing Program
SR 3.7.3.2	---------- NOTE ---------- For the MFRVs and MFRVBVs, only required to be performed in MODES 1 and 2. ---------- Verify each MFIV, MFRV and MFRVBV actuates to the isolation position on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.3.3	Verify the closure time of each MFIV is within limits.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	---------- NOTE ---------- Only required to be performed for the AFW flow control valves when the system is placed in automatic control or when THERMAL POWER is > 10% RTP. ---------- 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~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.5.2	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 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	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.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.4	---------- NOTE ---------- Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 900 psig in the steam generator. ---------- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.5.5	Verify proper alignment of the required AFW flow paths by verifying flow from the condensate storage tank to each steam generator.	Prior to entering MODE 2 whenever unit has been in MODE 5 or 6 for > 30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST contained water volume is ≥ 281,000 gal.	~~12 hours~~ In accordance with the Surveillance Frequency Control Program

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.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
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.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	---------- NOTE ---------- Isolation of ESW flow to individual components does not render the ESW inoperable. ---------- Verify each ESW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.8.2	Verify each ESW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	Verify each ESW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of UHS is ≥ 831.25 ft mean sea level.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Verify average water temperature of UHS is ≤ 90°F.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.9.3	Operate each cooling tower fan for ≥ 15 minutes in both the fast and slow speed.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CREVS train pressurization filter unit for ≥ 10 continuous hours with the heaters operating and each CREVS train filtration filter unit for ≥ 15 minutes.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.10.2	Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3	Verify each CREVS train actuates on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.10.4	Perform required unfiltered air inleakage testing of the CRE and CBE boundaries in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CRACS train has the capability to remove the assumed heat load.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each EES train for ≥ 10 continuous hours with the heaters operating.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.13.2	Perform required EES filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.13.3	Verify each EES train actuates on an actual or simulated actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.13.4	Verify one EES train can maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure in the auxiliary building during the SIS mode of operation.	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program
SR 3.7.13.5	Verify one EES train can maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure in the fuel building during the FBVIS mode of operation.	~~18 months on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.15 Fuel Storage Pool Water Level

LCO 3.7.15 The fuel storage pool water level shall be ≥ 23 ft over the top of the storage racks.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the fuel storage pool water level is ≥ 23 ft above the storage racks.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool boron concentration is within limit.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

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.	6 hours
	AND		
	A.2	Be in MODE 5.	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~~ In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. Required Action and associated Completion Time of Condition A, B, C, D, E, or F not met.	G.1	Be in MODE 3.	6 hours
	AND		
	G.2	Be in MODE 5.	36 hours
H. Three or more AC sources inoperable.	H.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
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. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. ----------	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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 ≥ 5580 kW and ≤ 6201 kW.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.4	Verify each fuel oil transfer pump starts on low level in the associated day tank standpipe.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.6	Verify each fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.	~~31 days~~ In accordance with the Surveillance Frequency Control Program

(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 in ≤ 12 seconds, voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~184 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Not used.	
SR 3.8.1.9	Not used.	
SR 3.8.1.10	Verify each DG operating at a power factor ≤ 0.9 and ≥ 0.8 does not trip and voltage is maintained ≤ 4784 V and frequency is maintained ≤ 65.4 Hz during and following a load rejection of ≥ 5580 kW and ≤ 6201 kW.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	---------- NOTES ---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not 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 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 ≤ 12 seconds, 2. energizes auto-connected shutdown loads through the shutdown load sequencer, 3. maintains steady state voltage ≥ 3740 V and ≤ 4320 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	---------- NOTES ---------- 1. All DG starts may be preceded by 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 ≤ 12 seconds after auto-start and during tests, achieves voltage ≥ 3740 V and ≤ 4320 V; b. In ≤ 12 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 remain energized from the offsite power system; and e. Emergency loads are auto-connected and energized through the LOCA load sequencer from the offsite power system.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated safety injection signal except: a. Engine overspeed; b. Generator differential current; c. Low lube oil pressure; d. High crankcase pressure; e. Start failure relay; and f. High jacket coolant temperature.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(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. 2. The DG may be loaded to ≥ 5580 kW and ≤ 6201 kW for the entire test period if auto-connected design loads are less than 6201 kW. ---------- Verify each DG operating at a power factor ≤ 0.9 and ≥ 0.8 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 6600 kW and ≤ 6821 kW; and b. For the remaining hours of the test loaded ≥ 5580 kW and ≤ 6201 kW.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
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 ≥ 5580 kW and ≤ 6201 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, in ≤ 12 seconds, voltage ≥ 3740 V, and ≤ 4320 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
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; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.17	---------- NOTE ---------- 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, 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. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.18	---------- NOTE ---------- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify interval between each sequenced load block is within ± 10% of design interval for each LOCA and shutdown load sequencer.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
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 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 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 ≤ 12 seconds, 2. energizes auto-connected emergency loads through LOCA load sequencer, 3. achieves steady state voltage ≥ 3740 V and ≤ 4320 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and	~~18 months~~ In accordance with the Surveillance Frequency Control Program (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19 (continued)	5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	
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, in ≤ 12 seconds, voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	~~10 years~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.1.21	---------- NOTE ---------- The continuity check may be excluded from the actuation logic test. ---------- Perform ACTUATION LOGIC TEST for each train of the load shedder and emergency load sequencer.	~~31 days on a STAGGERED TEST BASIS~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ 80,900 gal of fuel.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.3.2	Verify lubricating oil inventory is ≥ 750 gal.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
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 pressure in two starting air receivers is ≥ 435 psig or pressure in one starting air receiver is ≥ 610 psig, for each DG starting air subsystem.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~31 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.3.6	Not used.	

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One DC electrical power subsystem inoperable.	A.1	Restore DC electrical power subsystem to OPERABLE status.	2 hours
B. Require 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 3.8.4.1	Verify battery terminal voltage is ≥ 130.2 V on float charge.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 69E-6 ohm for cell to cell connections and ≤ 69E-6 ohm for terminal connections.	~~92 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.4.4	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.4.5	Verify battery connection resistance is ≤ 69E-6 ohm for cell to cell connections, and ≤ 69E-6 ohm for terminal connections.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.6	Verify each battery charger supplies ≥ 300 amps at ≥ 130.2 V for ≥ 1 hour.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.7	---------- NOTES ---------- 1. The modified performance discharge test in SR 3.8.4.8 may be performed in lieu of the service test in SR 3.8.4.7. 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.	~~18 months~~ In accordance with the Surveillance Frequency Control Program
SR 3.8.4.8	---------- 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~~ In accordance with the Surveillance Frequency Control Program AND 18 months when battery shows degradation or has reached 85% of expected life

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR One or more batteries with average electrolyte temperature of the representative cells < 60 °F. OR One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	~~92 days~~ In accordance with the Surveillance Frequency Control Program AND Once within 7 days after a battery discharge < 110 V AND Once within 7 days after a battery overcharge > 150 V
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is ≥ 60°F.	~~92 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required inverters inoperable. (continued)	A.2.3	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND		
.	A.2.4	Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One DC electrical power distribution subsystem inoperable.	C.1	Restore DC electrical power distribution subsystem to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time not met.	D.1 AND D.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
E. Two trains with inoperable distribution subsystems that result in a loss of safety function.	E.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution subsystems inoperable. (continued)	A.2.3	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND		
	A.2.4	Initiate actions to restore required AC, DC, and AC 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 AC vital bus electrical power distribution subsystems.	~~7 days~~ In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.9.4.2	---------- NOTE ---------- Only required for an open equipment hatch. ---------- Verify the capability to install the equipment hatch.	~~7 days~~ In accordance with the Surveillance Frequency Control Program
SR 3.9.4.3	Verify each required containment purge isolation valve actuates to the isolation position on a manual actuation signal.	~~18 months~~ In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RHR loop requirements not met. (continued)	A.3	Initiate action to satisfy RHR loop requirements.	Immediately
	AND		
	A.4	Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE REQUIREMENTS

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

3.9 REFUELING OPERATIONS

3.9.7 Refueling Pool Water Level

LCO 3.9.7 Refueling pool 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 pool 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 pool water level is ≥ 23 ft above the top of reactor vessel flange.	~~24 hours~~ In accordance with the Surveillance Frequency Control Program

5.5.17 Control Room Envelope Habitability Program (continued)

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

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

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 the 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.

ULNRC- 05725
Attachment 5

Proposed Technical Specification Bases Changes - Mark-Ups

Bases mark-ups are based on internal revisions through Revision 8f dated June 2010.

TS Bases Inserts

TSB 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)

In the event that a rod is known to be untrippable and not fully inserted, SDM verification must account for the worth of the untrippable rod as well as another rod of maximum worth.

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 15.1.5.
3. FSAR, Chapter 15, Section 15.4.6.
4. 10 CFR 100.
5. Westinghouse NSAL-02-14.

BASES

ACTIONS

A.1 and A.2 (continued)

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

B.1

If the core reactivity cannot be restored to within the 1% $\Delta k/k$ 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 (may include allowances for boron-10 depletion). The comparison is made, considering that other core conditions are fixed or stable, including control and shutdown 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 (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

D.1.1 and D.1.2 (continued)

potential xenon redistribution, the low probability of an accident occurring, and the steps required to complete the action. This allows the operator sufficient time to align the required valves and start the boric acid pumps. Boration will continue until the required SDM is restored.

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

Insert 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.

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

Insert 2 →

(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 MODE 3 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.

Insert 1 →

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

REFERENCES

1. 10 CFR 50, Appendix A, GDC 10, GDC 26, and GDC 28.
2. 10 CFR 50.46.
3. FSAR, Chapter 15, Section 15.1.5.

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 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. A Frequency of

Insert 1 → 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 15.
4. FSAR, Chapter 15, Section 15.1.5.
5. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

BASES

ACTIONS

C.1 (continued)

Completion Time of 15 minutes provides time for restoring T_{avg} to within limits without allowing the plant to remain in an unacceptable condition for an extended period of time. Operation with the reactor critical and with an operating loop's temperature below 541°F could violate the assumptions for accidents analyzed in the safety analyses.

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

The required power range and intermediate range channels must be OPERABLE in MODE 2 by LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." A CHANNEL OPERATIONAL TEST is performed on each OPERABLE power range and intermediate range channel prior to initiation of the PHYSICS TESTS. This will ensure that the RTS is properly aligned to provide the required degree of core protection during the performance of the PHYSICS TESTS.

SR 3.1.8.2

Verification that the RCS lowest operating loop T_{avg} is ≥ 541°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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 manner that could invalidate the safety analysis assumptions

During PHYSICS TESTS in which the requirements of LCOs 3.1.4, 3.1.5, and 3.1.6 are satisfied, the SDM surveillance consists of a verification that the rod insertion limits of LCOs 3.1.5 and 3.1.6 are met.

During PHYSICS TESTS in which the requirements of LCO 3.1.4, LCO 3.1.5, or LCO 3.1.6 are not met, the SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

a. RCS boron concentration (may include allowances for boron-10 depletion);

b. Control and shutdown rod position;

c. RCS average temperature;

d. Fuel burnup based on gross thermal energy generation;

e. Xenon concentration;

f. Samarium concentration; and

g. Isothermal temperature coefficient (ITC).

Using the ITC accounts for Doppler reactivity in this calculation when 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 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.

(continued)

BASES

ACTIONS

A.3 (continued)

Additionally, although not explicitly credited as a primary trip function, the Source Range Neutron Flux trip Function would provide protection for an RWFS event while RCS temperature is being increased.

Required Action A.3 is modified by a Note that states that it is not applicable in MODES 4 and 5. The Note provides assurance that this Required Action would only be taken in MODES 2 and 3 (i.e., during a plant startup) when the RCS temperature can readily be increased to ≥ 500°F. After the RCS cold leg temperatures are increased to ≥ 500°F, the requirements of LCO 3.1.9 are no longer applicable and protection for an RWFS event would be provided by the Power Range Neutron Flux - Low trip Function, which is required to be OPERABLE by LCO 3.3.1, "Reactor Trip System Instrumentation."

SURVEILLANCE REQUIREMENTS

SR 3.1.9.1

This SR ensures that the RCS boron concentration is within limit. The boron concentration is determined periodically by chemical analysis.

Insert 1

A Frequency of 24 hours is adequate based on the time required to significantly dilute the RCS, the various alarms available in the control room, and the heightened awareness in the control room when the rods are capable of being withdrawn. This Frequency also reflects the low probability of an accident occurring without the required level of RCS boration and allows time for the operator to collect the required data from a boron concentration analysis of an RCS sample.

REFERENCES

1. Westinghouse Nuclear Safety Advisory Letter NSAL-00-016, "Rod Withdrawal from Subcritical Protection in Lower Modes," December 4, 2000.

2. FSAR Section 15.4.1.

3. FSAR Table 16.3-1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1 (continued)

If THERMAL POWER has been increased by ≥ 10% RTP since the last determination of $F_Q^C(Z)$, another evaluation of this factor is required within 24 hours after achieving equilibrium conditions (to ensure that $F_Q^C(Z)$ values are being reduced sufficiently with power increase to stay within the LCO limits).

Insert 1 → 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).

SR 3.2.1.2

The nuclear design process includes calculations performed to determine that the core can be operated within the $F_Q(Z)$ limits. Because power distribution measurements are taken either at or near equilibrium conditions, the variations in power distribution resulting from normal operational maneuvers are not typically present in the flux map data. These variations are, however, conservatively calculated by considering a wide range of unit maneuvers in normal operation.

The maximum peaking factor increase over steady state values, calculated as a function of core elevation, Z, is called W(Z). Multiplying the measured total peaking factor, $F_Q^C(Z)$, by W(Z) gives the maximum $F_Q(Z)$ calculated to occur in normal operation, $F_Q^W(Z)$.

The limit with which $F_Q^W(Z)$ is compared varies inversely with power and directly with the function K(Z) provided in the COLR.

The W(Z) curve is provided in the COLR for discrete core elevations. Flux map data are typically taken for 30 to 75 core elevations. $F_Q^W(Z)$ evaluations are normally not applicable for the following axial core regions, measured in percent of core height:

a. Lower core region, from 0 to 15% inclusive; and

b. Upper core region, from 85 to 100% inclusive.

The top and bottom 15% of the core are excluded from the evaluation because of the low probability that these regions would be more limiting in

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.2 (continued)

the safety analyses and because of the difficulty of making a precise measurement in these regions. However, it is permissable to exclude a smaller region from the evaluation. This is desirable if, for example, the limiting elevation is in the upper or lower 15% of the core based on cycle-specific supporting analyses.

This Surveillance has been modified by a Note that may require that more frequent surveillances be performed. When $F_Q^C(Z)$ is measured, an evaluation of the expression below is required to account for any increase to $F_Q(Z)$ that may occur and cause the $F_Q(Z)$ limit to be exceeded before the next required $F_Q(Z)$ evaluation.

If the two most recent $F_Q(Z)$ evaluations show an increase in the expression

$$\text{maximum over } z \left[\frac{F_Q^C(Z)}{K(Z)}\right]$$

it is required to meet the $F_Q(Z)$ limit with the last $F_Q^W(Z)$ increased by the appropriate factor specified in the COLR, or to evaluate $F_Q(Z)$ more frequently, each 7 EFPD. (The 25% extension allowed by SR 3.0.2 applies to this frequency.) These alternative requirements 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 verifying the inferred results for 100% RTP meet 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 ≥ 10% RTP above the THERMAL POWER of its last verification, within 24 hours after achieving equilibrium conditions to ensure that $F_Q(Z)$ is within its limit at higher power levels.

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

Insert 1 → 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.1.2 (continued)

operated in accordance with the TS, to preclude adverse peaking factors between 31 day surveillances.

REFERENCES

1. 10 CFR 50.46, 1974.

2. FSAR, Section 15.4.8.

3. 10 CFR 50, Appendix A, GDC 26.

4. WCAP-7308-L-P-A, "Evaluation of Nuclear Hot Channel Factor Uncertainties," June 1988.

5. WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System," August 1994.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1 (continued)

such that the uncertainty allowances associated with the measurement are valid.

The value of $F^N_{\Delta H}$ is determined by either using the movable incore detector system to obtain a flux distribution map or from the power distribution information provided by an OPERABLE PDMS. A data reduction computer program then calculates the maximum value of $F^N_{\Delta H}$ from the measured flux distribution map. The measured value of $F^N_{\Delta H}$ must have the appropriate uncertainty included (4% for a flux distribution map and $U_{\Delta H}$ as defined in Reference 4 for a PDMS surveillance) before comparison to the limit. The value of $U_{\Delta H}$ is determined using the formula in the COLR.

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 verifying the inferred results for 100% RTP meet the 100% RTP $F^N_{\Delta H}$ limit, provides assurance that $F^N_{\Delta H}$ limit will be 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. FSAR, Section 15.4.8.

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)

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

A.1

As an alternative to restoring the AFD to within its specified limits, Required Action A.1 requires a THERMAL POWER reduction to < 50% RTP. This places the core in a condition for which the value of the AFD is not important in the applicable safety analyses.

A Completion Time of 30 minutes is reasonable, based on operating experience, to reach 50% RTP without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

This Surveillance verifies that the AFD, as indicated by the NIS excore 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.

Insert 1

REFERENCES

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

2. WCAP-10216-P-A, "Relaxation of Constant Axial Offset Control and FQ Surveillance Technical Specification," February 1994.

3. FSAR, Chapter 7.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1 (continued)

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 inputs from one or more Power Range Neutron Flux channels are inoperable and the THERMAL POWER is > 75% RTP.

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 power range channel is inoperable, the moveable incore detectors may be 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. If one of the symmetric thimbles is not available, then other pairs (triples) of symmetric thimbles can be monitored to gain information about the quadrant with the out-of-service thimble, provided the reference case is set up with the same thimble groupings (Ref. 4). Therefore, incore monitoring of 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

(continued)

BASES

ACTIONS

Z.1.1, Z.1.2, and Z.2 (continued)

operating with the MODES and specified conditions in the Applicability discussed above under Condition Y.

If the inoperable channel can not be placed in the tripped condition within the specified 72-hour Completion Time, or if two or more channels are inoperable, action must be initiated to fully insert all rods and to make the Rod Control System incapable of rod withdrawal (e.g., by de-energizing all CRDMs, by opening the RTBs, or de-energizing the motor generator (MG) sets). These actions will preclude an uncontrolled RCCA bank withdrawal accident from occurring.

If the inoperable channel cannot be placed in the tripped condition within the specified 72-hour Completion Time, or if two or more channels are inoperable, an alternate action is to initiate boration of the RCS to greater than the all-rods-out (ARO) critical boron concentration. Borating the RCS to greater than ARO critical boron concentration would provide sufficient SHUTDOWN MARGIN if an uncontrolled RCCA bank withdrawal event were to occur.

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

SR 3.3.1.1

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1 (continued)

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.

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 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the power range channel output ~~every 24 hours~~. If the calorimetric heat balance calculation results exceed the power range channel output by more than +2% RTP, the power range channel is not declared inoperable, but must be adjusted. The power range channel output shall be adjusted consistent with the calorimetric heat balance calculation results if the calorimetric calculation exceeds the power range channel output by more than +2% RTP. If the power range channel output cannot be properly adjusted, the channel is declared inoperable.

If the calorimetic is performed at part-power (<40% RTP), adjusting the power range channel indication in the increasing power direction will assure a reactor trip below the power range high safety analysis limit (SAL) of ≤ 118% RTP in FSAR Table 15.0-4 (Reference 10). Making no adjust to the power range channel in the decreasing power direction due to a part-power calorimetric assures a reactor trip consistent with the safety analyses.

This allowance does not preclude making indicated power adjustments, if desired, when the calorimetric heat balance calculation power is less than the power range channel output. To provide close agreement between indicated power and to preserve operating margin, the power range channels are normally adjusted when operating at or near full power during steady-state conditions. However, discretion must be exercised if

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2 (continued)

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 ≥ 2%, 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 ≥ 2%. The purpose of the comparison is to check for differences that result from core power distribution changes that may have occurred since the last required adjustment or incore-excore calibration (SR 3.3.1.6). 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 been verified to be OPERABLE for subsequent use. Due to such effects as shadowing from the relatively deep control rod insertion and, to a lesser extent, the axially-dependent radial leakage which varies with power level, the relationship between the incore and excore indications of axial flux difference (AFD) at lower power levels is variable. Thus, it is acceptable to defer the calibration of the excore AFD against the incore AFD until more stable conditions are attained (i.e., withdrawn control rods and a higher power level). The AFD is used as an input to the Overtemperature ΔT reactor trip function and for assessing compliance with 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

LCO 3.2.3; thus, the proposed change is consistent with the 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, the slow changes in neutron flux during the fuel cycle can be detected during this interval.

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. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

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 18.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested ~~every 92 days on a STAGGERED TEST BASIS~~, using the semiautomatic tester. The train being tested is placed in the bypassed condition, 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 Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 18.

Insert 1 →

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 22). 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. Determination of the loop-specific vessel ΔT and T_{avg} values should be made when performing this calibration, under steady state conditions (ΔT_0 and T' [T" for Overpower ΔT] when at 100% RTP).

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 achieving equilibrium conditions with THERMAL POWER ≥ 75% RTP is allowed for performing the first surveillance. Equilibrium conditions are achieved when the core is sufficiently stable at intended operating conditions to obtain a power distribution measurement.

The SR is deferred until a scheduled testing plateau above 75% RTP is attained during a power ascension. During a typical 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.6 (continued)

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 OPERABLE for subsequent use.

Insert 1 →

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

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

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 Applicability is exited and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the Rod Control System capable of rod withdrawal of one or more rods not fully inserted 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.

Insert 1 → ~~The Frequency of 184 days is justified in Reference 18.~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7 and 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. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. 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 reactor 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. 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 18.

the frequency specified in the Surveillance Frequency Control Program

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.9

Insert 1 → SR 3.3.1.9 is the performance of a TADOT ~~and is performed every 92 days, as justified in Reference 5~~. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

This SR is modified by a Note that excludes verification of setpoints from the TADOT. Setpoint verification is accomplished during the CHANNEL CALIBRATION.

SR 3.3.1.10

Insert 1 → A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint methodology.

Insert 1 → The Frequency of 18 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. This does not include verification of time delay relays. These are verified via response time testing per SR 3.3.1.16. See the discussion of ΔT_0 in the Applicable Safety Analyses for the Overtemperature ΔT and Overpower ΔT trip functions. Whenever an RTD is replaced in Function 6 or 7, 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.

The CHANNEL CALIBRATION of Function 6, Overtemperature ΔT, includes the axial flux difference penalty circuitry in the 7300 Process Protection System cabinets, but does not include the power range neutron detectors. SR 3.3.1.11 and its Notes 1 and 3 govern the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.10 (continued)

performance and timing of the power range neutron detector plateau voltage verification.

Although not required for any safety function, the CHANNEL CALIBRATION of Function 10, Reactor Coolant Flow-Low, will ensure proper performance and normalization of the RCS flow indicators.

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10 every 18 months. This SR is modified by three Notes. Note 1 states that neutron detectors are excluded from the CHANNEL CALIBRATION. Neutron detectors are excluded from the CHANNEL CALIBRATION because it is impractical to set up a test that demonstrates and adjusts neutron detector response to known values of the parameter (neutron flux) that the channel monitors. Note 1 applies to the source range proportional counters, intermediate range ion chambers, and power range ion chambers in the Nuclear Instrumentation System (NIS). Note 2 states that this test shall include verification that the time constants are adjusted to the prescribed values where applicable. Detector plateau curves are obtained, evaluated, and compared to manufacturer's data for the intermediate and power range neutron detectors. The testing of the source range neutron detectors consists of obtaining integral bias curves, evaluating those curves, and comparing the curves to previous data. Note 3 states that the power and intermediate range detector plateau voltage verification 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 integral bias curves are obtained under the conditions that apply during a plant outage.

Insert 1 →

The 18 month Frequency is based on past operating experience, which has shown these components usually pass the Surveillance when performed on the 18 month Frequency. The conditions for obtaining the source range integral bias curves and the power and intermediate range detector plateau voltages are described above. The other remaining

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.11 (continued)

portions of the CHANNEL CALIBRATIONS may be performed either during a plant outage or during plant operation.

SR 3.3.1.12

Not used.

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks every 18 months. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Insert 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, the SI Input from ESFAS, and the Reactor Trip Bypass Breaker undervoltage trip mechanisms. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This TADOT is performed every 18 months.

The Manual Reactor Trip TADOT shall independently verify the OPERABILITY of the undervoltage and shunt trip handswitch contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip mechanism.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.14 (continued)

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.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This TADOT is performed prior to exceeding the P-9 interlock whenever the unit has been in MODE 3. This Surveillance is not required if it has been performed within the previous 31 days. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-9 interlock.

SR 3.3.1.16

SR 3.3.1.16 verifies that the individual channel actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time verification acceptance criteria are included in Reference 8. No credit was taken in the safety analyses for those channels with response times listed as N.A. No response time testing requirements apply where N.A. is listed in Reference 8. 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 until loss of stationary gripper coil voltage (at which point the rods are free to fall).

The safety analyses include the sum of the following response time components:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

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 re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in References 9 and 15 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 18 months on a STAGGERED TEST BASIS. Each verification shall include at least one train such that both trains are verified at least once per 36 months. Response time verification for the functions listed in References 8 and 10 includes testing of the response time for the reactor trip breakers to open (identified as item (e) in the above description of the safety analysis response time components).

Another component of the overall RTS response time verification for the functions listed in References 8 and 10 is the gripper release time which is described in item (f) in the above description of the safety response time components. This is the time for the control and shutdown rod drive stationary gripper coil voltage to decay and the RCCA grippers to mechanically release, thereby rendering the control and shutdown rods free to fall.

SR 3.1.4.3 verifies the rod drop time "from the beginning of decay of stationary fripper coil voltage to dashpot entry." The end point of the RTS response time definition, i.e., "until loss of stationary gripper coil voltage," is less discernible and would overlap a portion of the total rod drop time verified in SR 3.1.4.3. However, the gripper release time may conservatively be quantified as the time from when the reactor trip breaker opens until the time when rod movement is first detected.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

Some portions of the response time testing cannot be performed during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.3.1.16 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response. Response time of the neutron flux signal portion of the channel shall be verified from detector output or input to the first electronic component in the channel.

REFERENCES

1. FSAR, Chapter 7.
2. FSAR, Chapter 15.
3. IEEE-279-1971.
4. 10 CFR 50.49.
5. Callaway OL Amendment No. 17 dated September 8, 1986.
6. Callaway Setpoint Methodology Report, SNP (UE)-565 dated May 1, 1984.
7. Callaway OL Amendment No. 43 dated April 14, 1989.
8. FSAR Section 16.3, Table 16.3-1.
9. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.
10. FSAR Table 15.0-4.
11. WCAP-9226-P-A, "Reactor Core Response to Excessive Secondary Steam Releases," Revision 1, February 1998.
12. Deleted.
13. FSAR Section 15.1.1.

(continued)

BASES

ACTIONS

S.1, S.2.1, and S.2.2 (continued)

The Required Actions are modified by a Note that allows one train to be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. This allowance is based on the reliability analysis (Reference 13) assumption that 4 hours is the average time required to perform channel surveillance.

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 clarify that Table 3.3.2-1 determines which SRs REQUIREMENTS 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. 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 determined by the unit staff, 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1 (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.

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 bypassed 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 19.

Insert 1 →

SR 3.3.2.3

SR 3.3.2.3 is the performance of an ACTUATION LOGIC TEST using the BOP ESFAS automatic tester. The continuity check does not have to be performed, as explained in the Note. This SR is applied to the balance of plant actuation logic and relays that do not have circuits installed to perform the continuity check. This test is required every 31 days on a STAGGERED TEST BASIS. The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data. In addition, SR 3.3.2.3 is the performance of an ACTUATION LOGIC TEST of the MSFIS PLC actuation logic, initiated from the SSPS slave relays. The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

Insert 1 →

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.4 (continued)

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 every 92 days on a STAGGERED TEST BASIS is justified in Reference 19.

Insert 1

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 channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

Insert 1 → The Frequency of 184 days is justified in Reference 19.

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 92 days. The SR is modified by a Note that excludes slave relays K602, K620, K622, K624, K630, K740, K741, and K750 which are included in testing required by SR 3.3.2.13 and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.6 (continued)

Insert 1 →

SR 3.3.2.14. The Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.2.7

SR 3.3.2.7 is the performance of a TADOT every 18 months. This test is a check of the AFW pump start on Loss of Offsite Power trip Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The trip actuating devices tested within the scope of SR 3.3.2.7 are the LSELS output relays and BOP ESFAS separation groups 1 and 4 logic associated with the automatic start of the turbine driven auxiliary feedwater pump on an ESF bus undervoltage condition The Frequency is adequate. It is 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 for relays. The trip actuating devices tested have no associated setpoint.

Insert 1 →

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 and AFW pump start on trip of all MFW pumps (PAE01A and PAE01B). The Manual Safety Injection TADOT shall independently verify OPERABILITY of the undervoltage and shunt trip handswitch contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers as well as the contacts for safety injection actuation. It is performed every 18 months. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. 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. The Note exclusion does not

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENT

SR 3.3.2.8 (continued)

explicitly apply to the AFW pump start on trip of both turbine-driven MFW pumps; however, the TADOT test procedures for that Function do not require the verification of a nominal trip setpoint or allowable value since none have ever been specified in the Technical Specifications for that anticipatory actuation signal which is not credited in any accident or transient analysis.

SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.CHANNEL CALIBRATIONS must be performed consistent with the assumptions of Reference 6.

Insert 1 →

The Frequency of 18 months is based on the assumed 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. This does not include verification of time delay relays. These are verified via response time testing per SR 3.3.2.10.

The portion of the automatic PORV actuation circuitry required for COMS is calibrated in accordance with SR 3.4.12.9.

SR 3.3.2.10

This SR verifies the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response time verification acceptance criteria are included in Reference 9. No credit was taken in the safety analyses for those channels with response times listed as N.A. No response time testing requirements apply where N.A. is listed in Reference 9. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.10 (continued)

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 time in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in References 10 and 14 may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

Insert 1 →

ESF RESPONSE TIME verification is performed on an 18 month STAGGERED TEST BASIS. Each verification shall include at least one train such that both trains are verified at least once per 36 months. Testing of the final actuation devices, which make up the bulk of the response time, is included in the verification of each channel. The final actuation device in one train is tested with each channel. Therefore, staggered testing results in response time verification of these devices every 18 months. The 18 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 900 psig in the SGs.

SR 3.3.2.11

SR 3.3.2.11 is the performance of a TADOT for the P-4 Reactor Trip Interlock. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The 18 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. This

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.11 (continued)

TADOT does not include the circuitry associated with steam dump operation since it is control grade circuitry.

SR 3.3.2.12

SR 3.3.2.12 is the performance of a monthly COT on ESFAS Function 6.h, "AFW Pump Suction Transfer on Suction Pressure - Low." A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

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

The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

Insert 1 →

specified in the Surveillance Frequency Control Program

SR 3.3.2.13

SR 3.3.2.13 is the performance of a SLAVE RELAY TEST as described in SR 3.3.2.6, except that SR 3.3.2.13 has a Note specifying that it applies only to slave relays K602, K622, K624, K630, K740, and K741. These slave relays are tested with a Frequency of 18 months and prior to entering MODE 4 for Functions 1.b, 3.a.(2), and 7.a whenever the unit has been in MODE 5 or 6 for > 24 hours, if not performed within the previous 92 days (Reference 12). The 18 month Frequency for these slave relays is based on the need to perform this Surveillance under the conditions that apply during a unit outage to avoid the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

Insert 1 →

SR 3.3.2.14

SR 3.3.2.14 is the performance of a SLAVE RELAY TEST as described in SR 3.3.2.6, except that SR 3.3.2.14 has a Note specifying that it applies only to slave relays K620 and K750. These slave relays are tested with a

(continued)

specified in the Surveillance Frequency Control Program

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.14 (continued)

Frequency ~~of 18 months~~ and prior to entering MODE 3 for Functions 5.a and 9.a whenever the unit has been in MODE 5 or 6 for > 24 hours, if not performed within the previous 92 days. The 18 month Frequency for these slave relays is based on the need to perform this Surveillance under the conditions that apply during a unit outage to avoid the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The SLAVE RELAY TEST of relay K620 does not include the circuitry associated with the main feedwater pump trip solenoids since that circuitry serves no required safety function. The 18 month Frequency for slave relay K620 was accepted by NRC at initial plant licensing based on Reference 12. The 18 month Frequency for slave relay K750 is consistent with that of SR 3.4.11.2 in LCO 3.4.11, Pressurizer PORVs," which in turn is based on the NRC-approved Inservice Test (IST) program relief request BB-10 on the pressurizer PORVs (Ref. 17). Testing slave relay K750 at power would result in opening the PORVs and depressurizing the RCS. If the PORV block valves are closed, there is not enough pressure to open the PORVs.

Insert 1 →

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 7.
3. FSAR, Chapter 15.
4. IEEE-279-1971.
5. 10 CFR 50.49.
6. Callaway Setpoint Methodology Report (NSSS), SNP (UE)-565 dated May 1, 1984, and Callaway Instrument Loop Uncertainty Estimates (BOP), J-U-GEN.
7. Not used.
8. Callaway OL Amendment No. 64 dated October 9, 1991.
9. FSAR Section 16.3, Table 16.3-2.
10. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.

(continued)

BASES

ACTIONS

G.1 (continued)

provide an alternate means for RVLIS. These three parameters provide diverse information to verify there is adequate core cooling. When Containment Radiation Level (High Range) monitors (GTRIC0059 and GTRIC0060 or GTRR0060) are inoperable, the area radiation monitors inside containment are used as an alternate method below 10 R/hr, and portable survey equipment with the capability to detect gamma radiation over the range 1E-03 to 1E 04 R/hr is used above 10 R/hr.

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 RM-23 unit display for loop GTR-0059, and either the RM-23 unit display or the GTRR0060 recorder for loop GTR-0060, must be used to perform the CHANNEL CHECK of the Containment Radiation Level (High Range) monitors.

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. The containment hydrogen analyzers are not normally energized.

Insert 1 → The Frequency of 31 days is based on operating experience that demonstrates that channel failure is rare. The CHANNEL CHECK

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1 (continued)

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 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. This SR is modified by a Note that excludes neutron detectors. Neutron detectors are excluded from the CHANNEL CALIBRATION because it is impractical to set up a test that demonstrates and adjusts neutron detector response to known values of the parameter (neutron flux) that the channel monitors. The Note applies to the Gamma-Metrics fission chambers associated with the indicators discussed in the LCO Bases. Containment Radiation Level (High Range) CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10R/hr and a one point calibration check of the detector below 10R/hr with an installed or portable gamma source. The Frequency is based on operating experience and consistency with the typical industry refueling cycle. During performance of the CHANNEL CALIBRATION for the Containment Radiation Level (High Range) monitors, verification of the RM-23 unit display and alarm functions is required. In addition, recorder GTRR0060 is included in the CHANNEL CALIBRATION of loop GTR-0060.

Insert 1

Whenever an RTD is replaced in Functions 2 or 3, 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 a core exit thermocouple is replaced in Functions 14, 15, 16, or 17, the next required CHANNEL CALIBRATION of the core exit thermocouples is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

REFERENCES

1. FSAR Appendix 7A.

2. NRC Letter, "Callaway Plant, Unit 1 - Emergency Response Capability - Conformance to Regulatory Guide 1.97, Revision 2," B.J. Youngblood to D.F. Schnell, dated April 10, 1985.

(continued)

BASES

ACTIONS (continued)

Condition was entered for that Function. When the Required Channels in Table 3.3.4-1 are specified on a per trip breaker, per SG, or per pump basis, then the Condition may be entered separately for each trip breaker, SG, or pump as appropriate.

A.1

Condition A addresses the situation where one or more required Functions of the Remote Shutdown System listed in Table 3.3.4-1 or one or more required ASP controls are inoperable.

The Required Action is to restore the required Functions and ASP controls to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1

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. 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1 (continued)

and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. For the RTB Position and the RCP Breaker Position Functions, this surveillance requirement is met by verifying the actual position at the associated switchgear to the main control board indications.

As specified in the Surveillance, a CHANNEL CHECK is only required for those channels which are normally energized. The Westinghouse NIS source range neutron flux channel is not normally energized.

Insert 11 → 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 ASP control circuit and transfer switch performs the intended function. This verification is performed from the auxiliary shutdown panel. Operation of the equipment from the auxiliary 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 auxiliary shutdown panel.

Insert 1 → The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. (However, this Surveillance is not required to be performed only during a unit outage.) Operating experience demonstrates that auxiliary shutdown controls usually pass the Surveillance test when performed at the 18 month Frequency.

The Note allows entry into and operation in MODE 3 prior to performing the SR for the turbine driven AFW pump (Ref. 2). This allows testing the associated ASP controls in MODE 3.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

Insert 1 → The Frequency of 18 months is based upon operating experience and consistency with the typical industry refueling cycle.

The Notes exclude the source range neutron flux detectors and reactor trip breaker and RCP breaker position indications from the CHANNEL CALIBRATION. Neutron detectors are excluded from the CHANNEL CALIBRATION because it is impractical to set up a test that demonstrates and adjusts neutron detector response to known values of the parameter (neutron flux) that the channel monitors. Depending on which source range channel is used to satisfy the LCO, Note 1 applies to the source range proportional counter in the Nuclear Instrumentation System (NIS) associated with indicator SENI0031C or to the Gamma-Metrics fission chamber associated with indicator SENI0061X. As discussed in the Bases for SR 3.3.1.11, the CHANNEL CALIBRATION of the Westinghouse NIS source range channel consists of obtaining on integral bias curve, evaluating that curve, and comparing it to previous data.

Whenever an RTD is replaced in Function 5 or 6, 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.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 3 and GDC 19.

2. Callaway OL Amendments No. 45 dated May 16, 1989 and 108 dated March 11, 1996.

BASES

ACTIONS

B.1 (continued)

motor driven AFW pumps start via the LSELS, and diesel generator start) are an integral part of the LSELS, an inoperable LSELS may also prevent the loss of power instruments from performing their intended functions.

The Completion Time of Required Action F.2 in LCO 3.8.1, "AC Sources - Operating," should allow ample time to repair most failures during MODES 1-4 and takes into account the low probability of an event requiring an LOP DG start occurring during this interval. When the associated DG is required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies, the Completion Time of Required Action C.1 in LCO 3.8.2, "AC Sources - Shutdown," is consistent with the required times for actions requiring prompt attention.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

Tie breakers 52NG0116 and 52NG0216 shall be verified open ~~once every 7 days~~. This frequency is based on Reference 4. Reference 4 discusses the closure of tie breaker 52NG0116 between 480 Vac buses NG01 and NG03 or tie breaker 52NG0216 between 480 Vac buses NG02 and NG04 to repair failed or degraded equipment. Closure of an NG tie breaker in MODES 1, 2, 3, or 4 is not to be used for the performance of routine preventive maintenance work. Closure of the tie breaker will render all four degraded voltage channels for the associated 4.16 kV bus inoperable resulting in Condition B entry.

Insert 1 →

SR 3.3.5.2

SR 3.3.5.2 is the performance of a TADOT. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable ~~extensions~~. This test is performed every 31 days. ~~The test checks trip devices that provide~~ loss of voltage and ~~degraded~~ voltage input to the LSELS logic circuits. For these tests, the Trip Setpoints are verified and adjusted as necessary.

Insert 1 →

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2 (continued)

The SR is modified by a Note that excludes verification of time delays from the TADOT. Verification of the time delays for the loss of voltage and degraded voltage functions is only performed as part of the CHANNEL CALIBRATION (SR 3.3.5.3).

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. Verification of the time delays for undervoltage relays (1 second nominal) in the loss of voltage function (NB01011271DG, NB01131272DG, NB01161274DG, NB01171273DG, NB02011274DG, NB02101271DG, NB02161272DG, and NB02171273DG), for LSELS timers (8 seconds nominal) in the degraded voltage function (NFKS5000A&B, NFKS5001A&B, NFKS5002A&B, and NFKS5003A&B), and for time delay relays (111 seconds nominal) in the degraded voltage function (NB62RP332TDENB01, NB62RP332TDENB02, NB62RP333TDENB03, and NB62RP333TDENB04) is performed during the CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to 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 an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.5.4

SR 3.3.5.4 is the performance of the required response time verification every 18 months on a STAGGERED TEST BASIS on those functions with time limits provided in Reference 5. Each verification shall include at least one train such that both trains are verified at least once per 36 months.

Insert 1 →

(continued)

BASES

ACTIONS (continued)

B.1

Condition B applies to all Containment Purge Isolation Functions and addresses the train orientation of the BOP ESFAS actuation logic and actuation relays for these Functions. It also addresses the failure of both gaseous radiation monitoring channels, or the inability to restore a single failed gaseous radiation monitoring channel to OPERABLE status in the time allowed for Required Action A.1.

If one or more trains or manual initiation channels are inoperable, both gaseous radiation monitoring channels are inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action to place and maintain containment purge supply and exhaust valves in their closed position is met.

A Note is added stating that Condition B is only applicable in MODE 1, 2, 3, or 4.

C.1 and C.2

Condition C applies to the Manual Initiation Function. If one or more manual initiation channels are inoperable, operation may continue as long as the Required Action to place and maintain containment purge supply and exhaust valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately.

A Note states that Condition C is applicable during CORE ALTERATIONS or during movement of 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 Purge 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1 (continued)

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 using the BOP ESFAS automatic tester. The continuity check does not have to be performed, as explained in the Note. This SR is applied to the balance of plant actuation logic and relays that do not have circuits installed to perform the continuity check. This test is required every 31 days on a STAGGERED TEST BASIS. The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data.

Insert 1 →

SR 3.3.6.3

A COT is performed ~~every 92 days~~ on each required containment purge exhaust gaseous radiation monitor channel to ensure the channel will perform the intended Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.3 (continued)

extensions. 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 system isolation. The setpoint shall be left within the two-sided calibration tolerance band on either side of the nominal value.

Insert 1

SR 3.3.6.4

SR 3.3.6.4 is the performance of a TADOT. This test is a check of the Manual Initiation Function ~~and is performed every 18 months.~~ Each Manual Initiation channel is tested through the BOP ESFAS logic. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The channels tested have no setpoints associated with them.

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.

SR 3.3.6.5

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

Insert 1

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.6

SR 3.3.6.6 is the performance of the required response time verification ~~every 18 months on a STAGGERED TEST BASIS~~ on those functions with time limits provided in Reference 3. Each verification shall include at least one train such that both trains are verified at least once per 36 months.

Insert 1 →

REFERENCES

1. 10 CFR 100.11.
2. NUREG-1366, July 22, 1993.
3. FSAR Table 16.3-2.
4. Callaway OL Amendment No. 20 dated April 10, 1987.
5. Callaway OL Amendment No. 114 dated July 15, 1996.

BASES

ACTIONS

D.1 and D.2 (continued)

LCO requirements are not applicable. To achieve this status, the unit 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 unit conditions from full power conditions in an orderly manner and without challenging unit systems.

E.1 and E.2

Condition E applies when the Required Action and associated Completion Time for Conditions A, B, or C have not been met during CORE ALTERATIONS or when irradiated fuel assemblies are being moved. Movement of irradiated fuel assemblies and CORE ALTERATIONS must be suspended immediately to reduce the risk of accidents that would require CREVS actuation. This does not preclude movement of a component to a safe position.

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 CREVS 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,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1 (continued)

but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

Either the RM-11 or RM-23 displays may be used to perform the CHANNEL CHECK for the Control Room Radiation - Control Room Air Intake gaseous channels (GKRE0004 and GKRE0005).

SR 3.3.7.2

A COT is performed ~~once every 92 days~~ on each required control room air intake gaseous radiation monitor channel to ensure the channel will perform the intended function. This test verifies the capability of the instrumentation to provide the CREVS actuation. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The setpoints shall be left within the two-sided calibration tolerance band on either side of the nominal value. 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 using the BOP ESFAS automatic tester. The continuity check does not have to be performed, as explained in the Note. This SR is applied to the balance of plant actuation logic and relays that do not have circuits installed to perform the continuity check. This test is required every 31 days on a STAGGERED TEST BASIS. The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data.

Insert 1

SR 3.3.7.4

SR 3.3.7.4 is the performance of a TADOT. This test is a check of the Manual Initiation Function ~~and is performed every 18 months.~~ Each Manual Initiation channel is tested through the BOP ESFAS logic. A successful test of the required contact(s) of a channel relay may be

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.4 (continued)

performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Insert 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 channels tested have no setpoints associated with them.

SR 3.3.7.5

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

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

SR 3.3.7.6

SR 3.3.7.6 is the performance of the required response time verification ~~every 18 months on a STAGGERED TEST BASIS~~ on those functions with time limits provided in Reference 2. Each verification shall include at least one train such that both trains are verified at least once per 36 months.

Insert 1 →

SR 3.3.7.6 is modified by a Note stating that the radiation monitor detectors are excluded from ESF RESPONSE TIME testing. The Note is necessary because of the difficulty associated with generating an appropriate radiation monitor detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response. Response time of the channel shall be verified from the detector output or input to the first electronic component in the channel.

(continued)

BASES

ACTIONS

C.1.1, C.1.2, and C.2 (continued)

and Required Actions of LCO 3.7.13 immediately for one EES train made inoperable and the applicable Conditions and Required Actions of LCO 3.7.10 must be entered immediately for one CREVS train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed upon train inoperability as discussed in the Bases for LCO 3.7.13 and LCO 3.7.10. One EES train must also be placed in the FBVIS mode of operation and one CREVS train in the CRVIS mode of operation within 1 hour. This accomplishes the actuation instrumentation Function that has been lost and places the unit in a conservative mode of operation. The 1 hour Completion Time allows for activities such as changing sample filters on the OPERABLE channel while in Condition A, which requires entry into Condition C.

Alternatively, both EES trains may be placed in the FBVIS mode and both CREVS trains in the CRVIS mode within 1 hour. This ensures the EES function is performed even in the presence of a single failure.

D.1

Condition D applies when the Required Action and associated Completion Time for Conditions A, B, or C have not been met and irradiated fuel assemblies are being moved in the fuel building. Movement of irradiated fuel assemblies in the fuel building must be suspended immediately to eliminate the potential for events that could require EES actuation. This does not preclude movement of a fuel assembly to a safe position.

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 EES 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1 (continued)

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.

Either the RM-11 or RM-23 displays may be used to perform the CHANNEL CHECK for the Fuel Building Exhaust Radiation – Gaseous channels (GGRE0027 and GGRE0028).

SR 3.3.8.2

A COT is performed ~~once every 92 days~~ on each required fuel building exhaust gaseous radiation monitor channel to ensure the channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This test verifies the capability of the instrumentation to provide the EES actuation. The setpoints shall be left within the two-sided calibration tolerance band on either side of the nominal value. 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

SR 3.3.8.3 is the performance of an ACTUATION LOGIC TEST. ~~The actuation logic is tested every 31 days on a STAGGERED TEST BASIS.~~ All possible logic combinations are tested for each protection function. ~~The Frequency is based on the known reliability of the relays and controls~~

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.3 (continued)

~~and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~ The SR is modified by a Note stating that the continuity check may be excluded. This SR is applied to the balance of plant actuation logic and relays that do not have circuits installed to perform the continuity check.

SR 3.3.8.4

SR 3.3.8.4 is the performance of a TADOT. This test is a check of the Manual Initiation Function ~~and is performed every 18 months.~~ Each Manual Initiation channel is tested through the BOP ESFAS logic. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. 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 channels tested have no setpoints associated with them.

Insert 1

SR 3.3.8.5

Insert 1

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

REFERENCES

1. 10 CFR 100.11.
2. FSAR Section 7.3.3 and Table 7.3-5.

BASES

SURVEILLANCE REQUIREMENTS

C.1 and C.2 (continued)

analysis takes credit for the mixing volume associated with having at least one reactor coolant loop in operation.

Required Action C.1 requires that valves listed in the LCO Bases for LCO 3.9.2, "Unborated Water Source Isolation Valves", be closed and secured to prevent the flow of unborated water into the RCS. An inadvertent dilution event is precluded by locked valves for unborated reactor makeup water (BGV0178 and BGV0601), CVCS resin vessels configured with resin for dilution during normal operation (BG8522A, BG8522B, BGV0039, BGV0043, BGV0051, and BGV0055), and the purge line used during flushing of CVCS letdown radiation monitor (SJV0703) that isolate the RCS from potential source of unborated water. The 4 hour Completion Time is adequate to perform these local valve manipulations. The recurring 31 day verification of Required Action C.2 ensures these valves remain closed and secured for an extended Condition C entry.

SURVEILLANCE REQUIREMENTS

The BDMS trains are subject to a CHANNEL CHECK, valve closure in MODE 5, COT, CHANNEL CALIBRATION, and Response Time Testing. In addition, the requirement to verify one RCS loop in operation is subject to periodic surveillance.

SR 3.3.9.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that gross failure of source range 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1 (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.

SR 3.3.9.2

SR 3.3.9.2 requires that valve BGV0178 be closed and secured prior to entry into MODE 5. LCO 3.9.2, "Unborated Water Source Isolation Valves", requires that this valve also be closed and secured in MODE 6. Closing BGV0178 satisfies the boron dilution accident analysis assumption that flow orifice BGFO0010 limits the dilution flow rate to no more than 150 gpm in MODE 5. This Surveillance demonstrates that the valve is closed through a system walkdown. SR 3.3.9.2 is modified by a Note stating that it is only required to be performed in MODE 5. This Note requires that the surveillance ~~be performed prior to entry into MODE 5 and~~ every 31 days while in MODE 5. The 31 day frequency is based on engineering judgment and is considered reasonable in view of other administrative controls that will ensure that inadvertent valve opening is an unlikely possibility.

in accordance with the Frequency specified in the Surveillance Frequency Control Program.

Insert 1

SR 3.3.9.3

SR 3.3.9.3 requires the performance of a COT every 184 days, to ensure that each train of the BDMS and associated trip setpoints are fully operational. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This test shall include verification that the boron dilution flux multiplication setpoint is equal to or less than an increase of 1.7 times the count rate within a 10 minute period. The 1.7 flux multiplication setpoint is a nominal value. SR 3.3.9.3 is met if the measured setpoint is within a two-sided calibration tolerance band on either side of the nominal value. SR 3.3.9.3 is modified by a Note that provides a 4 hour delay in the requirement to perform this Surveillance after reducing power below the P-6 interlock. This Note allows a delay in the performance of the COT to reflect the delay allowed for the source range channels. If the plant is to remain below the P-6

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.9.3 (continued)

setpoint for more than 4 hours, this Surveillance must be performed prior to 4 hours after reducing power below the P-6 setpoint. The Frequency of ~~184 days is consistent with the~~ requirements for source range channels in Reference 2.

Insert 1

SR 3.3.9.4

SR 3.3.9.4 is the performance of a CHANNEL CALIBRATION ~~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 SR is modified by a Note that neutron detectors are excluded from the CHANNEL CALIBRATION. Neutron detectors are excluded from the CHANNEL CALIBRATION because it is impractical to set up a test that demonstrates and adjusts neutron detector response to known values of the parameter (neutron flux) that the channel monitors. The Note applies to the source range proportional counters in the Nuclear Instrumentation System (NIS).

The testing of the source range neutron detectors consists of obtaining integral bias curves, evaluating those curves, and comparing the curves previous data. The 18 month Frequency is based on operating experience and on the need to obtain integral bias curves under the conditions that apply during a plant outage. The other remaining portions of the CHANNEL CALIBRATION may be performed either during a plant outage or during plant operation.

Insert 1

SR 3.3.9.5

SR 3.3.9.5 is the performance of a response time test ~~every 18 months~~ to verify that, on a simulated or actual boron dilution flux multiplication signal, the centrifugal charging pump suction valves from the RWST open and the CVCS volume control tank discharge valves close in the required time of ≤ 30 seconds to reflect the analysis requirements of Reference 1.

Insert 1

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.6

SR 3.3.9.6 requires verification ~~every 12 hours~~ that one RCS loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing adequate mixing. 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 15.4.6.
2. Callaway OL Amendment 165.

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

SR 3.4.1.4

Measurement of RCS total flow rate by performance of a precision calorimetric heat balance ~~once every 18 months~~ allows the installed RCS flow instrumentation to be normalized and verifies the actual RCS flow rate is greater than or equal to the minimum required RCS flow rate. When performing a precision heat balance, the instrumentation used for determining steam pressure, feedwater temperature, and feedwater venturi Δp in the calorimetric calculations shall be calibrated within 7 days prior to performing the heat balance.

in accordance with the Surveillance Frequency Control Program, reflects

The Frequency of once after each refueling prior to THERMAL POWER exceeding 75% RTP, and ~~18 months reflects~~ the importance of

(continued)

BASES (Continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.2.1

RCS loop average temperature is required to be verified at or above 551°F ~~every 12 hours.~~

Insert 1 →

The SR to verify operating 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.

REFERENCES

1. FSAR, Chapter 15.

BASES

ACTIONS

C.1 and C.2 (continued)

the RCPB integrity remains acceptable and must be completed prior to entry into MODE 4. Several methods may be used, including comparison with pre-analyzed transients in the stress analyses, or inspection of the components.

ASME Code, Section XI, Appendix E (Ref. 7), may be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

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

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1

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. WCAP-14040-NP-A.

2. 10 CFR 50, Appendix G.

3. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.

(continued)

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, Chapter 15.

BASES

ACTIONS (continued)

D.1, D.2, and D.3

If four RCS loops are inoperable or no RCS loop is in operation, except as during conditions permitted by the Note in the LCO section, place the Rod Control System in a condition incapable of rod withdrawal (e.g., by de-energizing all CRDMs, by opening the RTBs, or de-energizing the MG sets). 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 of the RCS loops to OPERABLE status and operation must be initiated. Boron dilution requires forced circulation for proper mixing, and defeating the Rod Control System removes the possibility of an inadvertent rod withdrawal. 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. Introduction of reactor makeup water into the RCS from the Chemical and Volume Control System mixing tee is not permitted, operation of CVCS resin vessels configured with resin for dilution during normal operation is not permitted, and operation of the purge line associated with flushing the CVCS letdown radiation monitor is not permitted when no RCS loop is in operation, consistent with Required Action C.1 of LCO 3.3.9, "Boron Dilution Mitigation System (BDMS)." The immediate Completion Time reflects the importance of maintaining operation for heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

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.

Insert 1 → 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.

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 ≥ 7% for required RCS loops. If the SG secondary side narrow range

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.5.2 (continued)

water level is < 7%, 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

1. FSAR Section 15.4.6.

BASES

ACTIONS

A.1 and A.2 (continued)

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 circulation from at least one RCP 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. Introduction of reactor makeup water into the RCS from the Chemical and Volume Control System mixing tee is not permitted, operation of CVCS resin vessels configured with resin for dilution during normal operation is not permitted, and operation of the purge line associated with flushing the CVCS letdown radiation monitor is not permitted when no RCS loop is in operation, consistent with Required Action C.1 of LCO 3.3.9, "Boron Dilution Mitigation System (BDMS)." 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 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 ≥ 7% for required RCS loops. If the SG secondary side narrow range water level is < 7%, 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 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 1. FSAR Section 15.4.6.

BASES

ACTIONS

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 RCP is required to provide proper mixing. 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

B.1 and B.2 (continued)

core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. Introduction of reactor makeup water into the RCS from the Chemical and Volume Control System mixing tee is not permitted, operation of CVCS resin vessels configured with resin for dilution during normal operation is not permitted, and operation of the purge line associated with flushing the CVCS letdown radiation monitor is not permitted when no RCS loop is in operation, consistent with Required Action C.1 of LCO 3.3.9, "Boron Dilution Mitigation System (BDMS)." 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.

Insert 1 → 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.

SR 3.4.7.2

Verifying that at least two SGs are OPERABLE by ensuring their secondary side wide range water levels are ≥ 86% ensures an alternate decay heat removal method is available via natural circulation in the event that the second RHR loop is not OPERABLE. As shown in Reference 3, any narrow range level indication above 7% will ensure the SG tubes are covered. If both RHR loops are OPERABLE, this Surveillance is not needed. The 12 hour Frequency is considered adequate in view of other

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS

indications available in the control room to alert the operator to the loss of SG level.

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 wide range water level is ≥ 86% in at least two SGs, this

~~SR 3.4.7.3 (continued)~~

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 SGs to Remove Decay Heat by Natural Circulation."
2. FSAR Section 15.4.6.
3. TDB-001, "Tank Data Book, Steam Generators EBB01 (A,B,C,D)."

BASES (Continued)

not filled or when no RCS loop is in operation, consistent with Required Action C.1 of LCO 3.3.9, "Boron Dilution Mitigation System (BDMS)." 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 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. 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. FSAR Section 15.4.6.

BASES

ACTIONS

B.1 (continued)

of offsite power would be unlikely in this period. Pressure control may be maintained during this time using the remaining OPERABLE backup pressurizer heater group or the variable heater group.

C.1 and C.2

If one group of backup pressurizer heaters are 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 LCO limit to provide a minimum space for a steam bubble. The Surveillance is performed by observing the indicated level.

Insert 1 → The 12 hour interval has been shown by operating practice to be sufficient to regularly assess level for any deviation and verify that operation is consistent with the safety analyses assumption of ensuring that a steam bubble exists in the pressurizer. Alarms are also available for early detection of abnormal level indications.

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 backup pressurizer heaters are verified to have a capacity ≥ 150 kW (for each heater group). This is done by energizing the heaters and measuring circuit current. The Frequency of 18 months is considered adequate to

Insert 1 → detect heater degradation.

REFERENCES

1. FSAR, Chapter 15.

(continued)

BASES

ACTIONS (continued)

G.1 and G.2

If the Required Actions of Condition F are not met, 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 1, 2, 3, and 4 (with any RCS cold leg temperature ≤ 275°F), 5, and 6 (with the reactor vessel head on), automatic PORV OPERABILITY is required. See LCO 3.4.12 for requirements in MODES 4, 5, and 6.

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

Block valve cycling verifies that the valve(s) can be opened and closed.

Insert 1 ~~The basis for the Frequency of 92 days is the ASME Code (Ref. 4).~~

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 Actions 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 from a reliability standpoint.

REFERENCES

1. FSAR Section 15.5.1.
2. Regulatory Guide 1.32, February 1977.
3. FSAR, Section 15.2.
4. ASME Code for Operation and Maintenance of Nuclear Power Plants.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3 (continued)

incapable of injecting into the RCS such that a single failure or single action will not result in an injection into the RCS. This may be accomplished by placing the pump control switch in pull to lock and closing at least one valve in the discharge flow path, or by closing at least one valve in the discharge flow path and removing power from the valve operator, or by closing at least one manual valve in the discharge flow path under administrative controls.

Insert 1 → The Frequency of 12 hours is sufficient, considering administrative controls and other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 3.4.12.4

Each required RHR suction relief valve shall be demonstrated OPERABLE by verifying its RHR suction isolation valves are open and by testing it in accordance with the Inservice Testing Program. This Surveillance is only required to be performed if the RHR suction relief valve is being used to meet this LCO.

The RHR suction isolation valves are verified to be opened ~~every 72 hours.~~ The Frequency is considered adequate in view of other administrative controls such as valve status indications available to the operator in the control room that verify the RHR suction isolation valves remain open.

Insert 1 →

The ASME Code (Ref. 8), test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.

SR 3.4.12.5

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

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

b. ~~Once every 31 days~~ F for 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.

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.12.6

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

The PORV block valve must be verified open ~~every 72 hours~~ to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This Surveillance is only required to be performed if the PORV is being used to meet this 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 seat 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 PORV block valve remains open.

SR 3.4.12.7

Not used.

SR 3.4.12.8

Performance of a COT is required within 12 hours after decreasing RCS temperature to ≤ 275°F ~~and every 31 days~~ on each required PORV to verify and, as necessary, adjust its lift setpoint. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The COT will verify the setpoint is within the PTLR allowed maximum limits in the PTLR. PORV actuation could depressurize the RCS and is not required.

~~Insert 1~~ STET

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.8 (continued)

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

Insert 1 →

A Note has been added indicating that this SR is not required to be performed until 12 hours after decreasing any RCS cold leg temperature to ≤ 275°F.

SR 3.4.12.9

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

Insert 1 →

REFERENCES

1. 10 CFR 50, Appendix G.
2. Generic Letter 88-11.
3. ASME, Boiler and Pressure Vessel Code, Section III.
4. FSAR, Chapter 15.
5. 10 CFR 50, Section 50.46.
6. 10 CFR 50, Appendix K.
7. Generic Letter 90-06.
8. ASME Code for Operation and Maintenance of Nuclear Power Plants.
9. FSAR Section 5.2.2.10.
10. FSAR Section 6.3.2.
11. FSAR Section 7.6.4.
12. Amendment No. 124 to Facility Operating License NPF-30 dated April 2, 1998.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

Note 2 states that SR 3.4.13.1 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.

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.

SR 3.4.13.2 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 methodology of Reference 8. Leakage verification is provided by chemistry procedures that provide alternate means of calculating and confirming primary to secondary leakage is less than or equal to 150 gallons per day through any one SG.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

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

C.1

The inoperability of the RHR suction isolation valve interlock could allow inadvertent opening of the valves at RCS pressures in excess of the RHR system design pressure. If the RHR suction isolation valve interlock is inoperable, operation may continue as long as the affected RHR suction penetration is closed by at least one deactivated remote manual valve within 4 hours. This Action accomplishes the purpose of the interlock.

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

Performance of leakage testing on each RCS PIV used to satisfy Required Action A.1 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. 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.

Testing is to be performed every 18 months, but may be extended ~~a typical refueling cycle~~ if the plant does not go into MODE 5 for at least 7 days. The 18 month Frequency is consistent with 10 CFR 50.55a(g) (Ref. 7) as contained in the Inservice Testing Program, is within the frequency allowed by the American Society of Mechanical Engineers (ASME) Code (Ref. 6), and is based on the need to perform such surveillances under the conditions that apply during an outage and the potential for an

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1 (continued)

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 up to 2235 psig assuming the leakage to be directly proportional to pressure differential to the one-half power.

In addition, testing must be performed once after the check 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 check valve has been reseated. Within 24 hours is a reasonable and practical time limit for performing this test after opening or reseating a check valve.

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. The Note that allows this provision is complementary to the Frequency of prior to entry into MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months. 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.

SR 3.4.14.2

The RHR suction isolation valve interlock setpoint that prevents the valves from being opened is set so the actual RCS pressure must be < 425 psig to open the valves. This setpoint ensures the RHR design pressure will not be exceeded and the RHR relief valves will not lift. This Surveillance does not have to be met when the RHR suction relief valves

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.14.2 (continued)

are used to satisfy LCO 3.4.12. The 18 month Frequency is based on the need to perform the Surveillance under conditions that apply during a plant outage. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.

Insert 1

REFERENCES

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

BASES (Continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere particulate radioactivity monitors (GTRE0031 or GTRE0032). 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. The RM-23 unit display must be used to perform the CHANNEL CHECK.

Insert 1

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere particulate radioactivity monitors (GTRE0031 or GTRE0032). The test ensures that either monitor can perform its function in the desired manner. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Frequency of 92 days considers instrument reliability, and operating experience has shown that it is proper for detecting degradation. During performance of the COT, verification of the RM-23 unit display and alarm functions is required.

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 18 months is a typical refueling cycle and considers channel reliability. Operating experience has proven that this Frequency is acceptable. During performance of the CHANNEL CALIBRATION for the required containment atmosphere particulate radioactivity monitors (GTRE0031 or GTRE0032), verification of the RM-23 unit display and alarm functions is required.

Insert 1

REFERENCES

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

2. Regulatory Guide 1.45.

(continued)

BASES

ACTIONS (continued)

C.1 and C.2

If the Required Action and 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 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 this 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.

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

(continued)

BASES

ACTIONS

B.1 (continued)

insignificant effect on core damage frequency. In this Condition, the required contents of three accumulators cannot be assumed to reach the core during a LOCA. Due to the severity of the consequences should a LOCA occur in these conditions, the 24 hour Completion Time to open the valve, remove 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.

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

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.2 and SR 3.5.1.3

~~Every 12 hours~~ borated water volume and nitrogen cover pressure are verified for each accumulator. Only one set of non-safety channels (1 of 2) is required for water level and pressure indication. The 12 hour 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

SR 3.5.1.4

The boron concentration should be verified to be within required limits for each accumulator ~~every 31 days~~ since the static design of the accumulators limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Sampling the affected accumulator within 6 hours after a 70 gallon increase will identify whether inleakage 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. This is consistent with the recommendation of NUREG-1366 (Ref. 4).

Insert 1

SR 3.5.1.5

Verification ~~every 31 days~~ that power is removed from each accumulator isolation valve operator when the RCS pressure is > 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

REFERENCES

1. FSAR, Chapter 6.
2. 10 CFR 50.46.

(continued)

BASES

ACTIONS

A.1 (continued)

An event accompanied by a loss of offsite power and the failure of an EDG can disable one ECCS train until power is restored. A reliability analysis (Ref. 5) has shown that the impact of having one full ECCS train inoperable is sufficiently small to justify continued operation for 72 hours.

Reference 6 describes situations in which one component can disable both ECCS trains. With one or more component(s) inoperable such that 100% of the flow equivalent to a 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.

B.1 and B.2

If the inoperable train(s) 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. Misalignment of these valves could render both ECCS trains inoperable. Securing these valves in position by removal of power by the use of control hand-switches ensures that they cannot change position as a result of an active failure or be inadvertently misaligned. These valves are of the type, described in Reference 6, 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. In accordance with Reference 7, EMHV8802A (or EMHV8802B) can be stroked open for testing in MODES 1-3 provided that:

Insert 1

a. EMHV8821A (or EMHV8821B) is closed first, with power removed and the motor circuit breaker racked out, and remains closed until EMHV8802A (or EMHV8802B)is reclosed.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1 (continued)

b. The hand control switch for SI pump A (or SI pump B) is placed in pull to lock.

Closure of EMHV8821A or EMHV8821B isolates the associated SI pump from its cold leg injection path rendering that train inoperable; however, the opposite train is prevented from exceeding runout flow conditions which would occur if the opposite pump were connected to both cold leg and hot leg injection paths. The inoperable train's pump is then placed in pull to lock to prevent unanalyzed hot leg injection via its associated 8802 valve. Although one SI train would be rendered inoperable, more than 100% of the ECCS flow equivalent to a single OPERABLE ECCS train would be available, and the plant would be in CONDITION A.1 with a 72 hour restoration time rather than entering LCO 3.0.3.

SR 3.5.2.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a non-accident position provided the valve will automatically reposition within the proper stroke time. 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 capable of being mispositioned are in the correct position. ~~The 31 day Frequency is appropriate because the valves are operated under administrative control.~~ This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves and relief valves. Additionally, vent and drain valves are not within the scope of this SR.

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

SR 3.5.2.3

The ECCS pumps are normally in a standby, non-operating mode. As such, flow path piping has the potential to develop voids and pockets of

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.3 (continued)

entrained gases. Maintaining the piping from the ECCS pumps to the RCS full of water by venting RHR and SI pump casings and accessible ECCS discharge piping high point vents ensures that the system will perform properly, injecting its full capacity into the RCS upon demand. In conjunction with or in lieu of venting, Ultrasonic Testing (UT) may be performed to verify ECCS pumps and associated piping are full of water. The design of the centrifugal charging pump is such that significant noncondensible gases do not collect in the pump. Therefore, it is unnecessary to require periodic pump casing venting to ensure the centrifugal charging pumps will remain OPERABLE. Accessible high point vents are those that can be reached without hazard or high radiation dose to personnel. This will also prevent water hammer, pump cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SI signal or during shutdown cooling. 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

SR 3.5.2.4

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. The ECCS pumps are required to develop the following differential pressures on recirculation flow: 1) centrifugal charging pumps ≥ 2400 psid; 2) safety injection pumps ≥ 1445 psid; and 3) RHR pumps ≥ 165 psid. This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant safety analysis. SRs are specified in the applicable portions of the Inservice Testing Program, which encompasses the ASME Code. The ASME Code provides the activities and Frequencies necessary to satisfy the requirements.

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 or on an actual or simulated RWST Level Low-Low 1 Automatic Transfer signal coincident with an SI signal and that each ECCS pump starts on receipt

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.5 and SR 3.5.2.6 (continued)

of an actual or simulated SI signal. The containment recirculation sump to RHR pump isolation valves (EJHV8811A/B) automatically open upon receipt of an actual or simulated RWST Level Low-Low-1 Automatic Transfer signal coincident with an SI signal. In addition to testing that automatic function, SR 3.5.2.5 demonstrates that the RWST to RHR pump suction isolation valves (BNHV8812A/B) are capable of automatic closure after the EJHV8811A/B valves are fully open. The valve interlock functions are depicted in Reference 10. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for unplanned plant transients if the Surveillances were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment. The actuation logic is tested as part of ESF Actuation System testing, and equipment performance is monitored as part of the Inservice Testing Program.

Insert 1

SR 3.5.2.7

The correct position of throttle valves in the flow path is necessary for proper ECCS performance. These valves have mechanical stops to allow proper positioning for restricted flow to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. The 18 month Frequency is based on the same reasons as those stated in SR 3.5.2.5 and SR 3.5.2.6. The ECCS throttle valves are set to ensure proper flow resistance and pressure drop in the piping to each injection point in the event of a LOCA. Once set, these throttle valves are secured with locking devices and mechanical position stops. These devices help to ensure that the following safety analyses assumptions remain valid: (1) both the maximum and minimum total system resistance; (2) both the maximum and minimum branch injection line resistance; and (3) the maximum and minimum ranges of potential pump performance. These resistances and pump performance ranges are used to calculate the maximum and minimum ECCS flows assumed in the LOCA analyses of Reference 3.

Insert 1

SR 3.5.2.8

Periodic inspections of the containment sump suction inlet ensure that it is unrestricted and stays in proper operating condition. The 18 month Frequency is based on the need to perform this Surveillance under the

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.8 (continued)

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.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.
2. 10 CFR 50.46.
3. FSAR, Sections 6.3 and 15.6.
4. FSAR, Chapter 15, "Accident Analysis."
5. NRC Memorandum to V. Stello, Jr., from R. L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
6. IE Information Notice No. 87-01.
7. RFR-14801A.
8. ULNRC-2535 dated 12-18-91 (for SI and RHR pumps) and ULNRC-04583 dated 12-13-01 (for CCPs).
9. OL Amendment No. 68 dated 3-24-92 (for SI and RHR pumps and OL Amendment No. 150 dated 5-2-02 (for CCPs).
10. FSAR Figure 7.6-3.

BASES

ACTIONS (continued)

B.1

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

In this Condition, neither the ECCS nor the Containment Spray System can perform its design function. Therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the 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.

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 within the limits assumed in the accident analyses band. This Frequency is sufficient to identify a temperature change that would approach either limit and has been shown to be acceptable through operating experience.

Insert 1

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

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 injection and to support continued ECCS and Containment Spray System pump operation on recirculation. ~~Since the RWST volume~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.4.2 (continued)

Insert 1 → is normally stable and is protected by a low level alarm set above the required water volume, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

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.

Insert 1 → 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.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.
2. RFR-17070A.
3. FSAR Section 6.2.1.5 and Table 15.6-11.

BASES

LCO (continued)

The limit on seal injection flow must be met to render the ECCS OPERABLE. If these conditions are not met, the ECCS flow will not be as assumed in the accident analyses.

APPLICABILITY

In MODES 1, 2, and 3, the seal injection flow limit is dictated by ECCS flow requirements, which are specified for MODES 1, 2, 3, and 4. The seal injection flow limit is not applicable for MODE 4 and lower, however, because high seal injection flow is less critical as a result of the lower initial RCS pressure and decay heat removal requirements in these MODES. Therefore, RCP seal injection flow must be limited in MODES 1, 2, and 3 to ensure adequate ECCS performance.

ACTIONS

A.1

With the seal injection flow exceeding its limit, the amount of charging flow available to the RCS may be reduced. Under this Condition, action must be taken to restore the flow to below its limit. The operator has 4 hours from the time the flow is known to be above the limit to correctly position the manual seal injection throttle valves and thus be in compliance with the accident analysis. The Completion Time minimizes the potential exposure of the plant to a LOCA with insufficient injection flow and provides a reasonable time to restore seal injection flow within limits. This time is conservative with respect to the Completion Times of other ECCS LCOs; it is based on operating experience and is sufficient for taking corrective actions by operations personnel.

B.1 and B.2

When the Required Action 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 18 months~~ that the manual seal injection throttle valves are adjusted to give a flow within the limit ensures that proper manual seal injection throttle valve position, and hence, proper seal injection flow,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1 (continued)

is maintained. The seal water injection throttle valves are set to ensure proper flow resistance and pressure drop in the piping to each injection point in the event of a LOCA. The seal injection flow line resistance is established by adjusting the RCP seal water injection throttle valves such that the analyzed ECCS flow to the RCP seals is limited to 89 gpm with one centrifugal charging pump (CCP) operating at 550 gpm on its maximum pump curve. This accident analysis limit is met by positioning the valves so that the flow to the RCP seals is within the limits of Technical Specifications Figure 3.5.5-1 for a given differential pressure between the charging pump discharge header and the RCS pressurizer steam space pressure. The seal injection flow curve is presented with the pressure difference from BGTP0120 to the pressurizer steam space pressure as a function of total seal injection line flow. A flow measurement instrument uncertainty of 0.25 gpm per loop was accounted for in the calculation of the pressure drop from BGPT0120 to the seal injection connection. In addition, 2 psid is added to accommodate instrument uncertainty in the pressure drop measurement. An additional 4 psid has been conservatively added to the required pressure differential to allow for seal injection filter change out. Requiring as an initial condition that the filter used for each surveillance have a differential pressure less than or equal to 4 psid allows for post-surveillance filter change out with no differential pressure restriction.

Once set, these throttle valves are secured with locking devices and mechanical position stops. The Frequency of 18 months is based on engineering judgment and the controls placed on the positioning of these valves. The Frequency has proven to be acceptable through operating experience.

Insert 1

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

REFERENCES

1. FSAR, Sections 6.3 and 15.6.5.
2. 10 CFR 50.46.

BASES

ACTIONS

D.1 and D.2 (continued)

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

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

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 reliable 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

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

under the conditions that apply during a plant outage, and the potential for loss of containment OPERABILITY if the Surveillance were performed with the reactor at power. The 24 month Frequency for the interlock is justified based on generic operating experience. The Frequency is based on engineering judgement and is considered adequate given that the interlock is not challenged during the use of the air lock.

REFERENCES

1. 10 CFR 50, Appendix J, Option B.
2. FSAR, Section 3.8, 6.2, and 15.

BASES (Continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

Insert 1

Each 36 inch Containment Shutdown Purge valve outside containment is required to be verified sealed closed or closed with blind flange installed ~~at 31 day intervals~~. Each 36 inch Containment Shutdown Purge valve inside containment must be verified sealed closed or blind flange installed prior to entering Mode 4 from Mode 5, if the surveillance has not been performed in the previous 92 days. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a Containment Shutdown Purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Therefore, these valves are required to be in the sealed closed position or closed with blind flange installed during MODES 1, 2, 3, and 4. A Containment Shutdown Purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness. The Frequency is a result of an NRC initiative, Multi-Plant Action No. B-24 (Ref. 5), related to containment purge valve use during plant operations. In the event Containment Shutdown Purge valve leakage requires entry into Condition D, the Surveillance permits opening one purge valve in a penetration flow path to perform repairs. A blind flange installed to isolate a Containment Shutdown Purge valve must meet the leakage rate testing requirements of SR 3.6.3.6.

SR 3.6.3.2

This SR ensures that the mini-purge valves are closed as required or, if open, open for an allowable reason. If a mini-purge valve is open in violation of this SR, the valve is considered inoperable. If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The SR is not required to be met when the mini-purge valves are open for the reasons stated. The valves may be opened for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open. The mini-purge valves are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day Frequency is consistent with other containment isolation valve requirements discussed in SR 3.6.3.3.

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 the closed position, since these valves were verified to be in the current 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 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 the closed position, since

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.4 (continued)

these valves were verified to be in the current position upon locking, sealing, or securing.

A Note has been added that 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. An automatic power operated containment isolation valve is a containment isolation valve which is closed by an automatic (i.e., other than operator manual) actuation signal and is powered by other than manual actuation (e.g. by a pneumatic, solenoid, or motor operator). 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

Leakage integrity tests with a maximum allowable leakage rate for containment shutdown purge supply and exhaust isolation valves will provide early indication of resilient material seal degradation and will allow opportunity for repair before gross leakage failures could develop.

This SR is modified by a Note indicating that the SR is only required to be performed when the containment shutdown purge valve blind flanges are installed.

Insert 1

If the blind flange is installed, leakage rate testing of the valve and its associated blind flange must be performed ~~every 24 months and~~ following each reinstallation of the blind flange. Operating experience has demonstrated that this testing frequency is adequate to assure this penetration is leak tight.

Leakage rate testing must also be performed

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.6 (continued)

The combined leakage rate for the containment shutdown purge supply and exhaust isolation valves, when pressurized to P_a, and included with all Type B and C penetrations is less than 0.60 L_a.

SR 3.6.3.7

For containment mini-purge and shutdown purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option B is required to ensure OPERABILITY. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), a Frequency of 184 days was established as part of the NRC resolution of Multi-Plant Action No. B-20, "Containment Leakage Due to Seal Deterioration" (Ref. 4).

Insert 1

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

The SR is modified by a Note indicating that the SR is only required to be performed for the containment shutdown purge valves when the associated blind flange is removed.

The measured leakage rate for each containment mini-purge supply and exhaust isolation valve with resilient seals is less than 0.05 L_a when pressurized to P_a.

The combined leakage rate for the containment shutdown purge supply and exhaust isolation valves, when pressurized to P_a, and included with all Type B and C penetration is less than .60 L_a.

SR 3.6.3.8

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic containment

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.8 (continued)

isolation valve will actuate to its isolation position on a containment isolation signal. These isolation signals are Phase A Isolation signal, Phase B Isolation signal, and Containment Purge Isolation signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

Insert 1 →

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

REFERENCES

1. FSAR, Section 15.
2. FSAR, Section 6.2.
3. Standard Review Plan 6.2.4.
4. Multi-Plant Action MPA-B020, "Containment Leakage Due to Seal Deterioration."
5. Multi-Plant Action MPA-B024, "Venting and Purging Containments While at Full Power and Effect of LOCA."
6. FSAR Section 16.6.
7. NUREG 0830, "Safety Evaluation Report related to the Operation of Callaway Plant Unit No. 1," Section 6.2.3, October, 1981.

BASES

ACTIONS

B.1 and B.2 (continued)

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 3.6.4.1

Verifying that containment pressure is within limits ensures that unit operation remains within the limits assumed in the containment analysis.

Insert 1 →

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

REFERENCES

1. FSAR, Section 6.2.
2. 10 CFR 50, Appendix K.

BASES (Continued)

APPLICABILITY

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

ACTIONS

A.1

When containment average air temperature is not within the limit of the LCO, it must be restored 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 arithmetical average is calculated using four temperature measurements, on fixed or portable instruments. The temperature measurements are taken at the following locations: a) Containment Cooler Inlet located near NNE wall (Elevation 2068'-8");
b) Containment Cooler Inlet located near West wall (Elevation 2068'-8");
c) Containment Cooler Inlet located near NNW wall (Elevation 2068'-8");
d) Containment Cooler Inlet located near East wall (Elevation 2068'-8").

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1 (continued)

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.

REFERENCES

1. FSAR, Section 6.2.
2. 10 CFR 50.49.
3. FSAR Section 6.2.1.4.3.3.

BASES

ACTIONS (continued)

D.1 and D.2

If the Required Action and associated Completion Time of Condition C of this LCO are not met, the 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.

E.1 and E.2

With two containment spray trains or two containment cooling trains inoperable, the unit is in a condition outside the accident analysis. Therefore, 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 six 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 3.6.6.1

Verifying the correct alignment for manual, power operated, and automatic valves in the containment spray flow path provides assurance that the proper flow paths will exist for Containment Spray System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. This 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. ~~The 31 day Frequency is appropriate because the valves are operated under administrative control.~~ This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves and relief valves. Additionally, vent and drain valves are not within the scope of this SR.

Insert 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1 (continued)

The 31-day frequency is based on engineering judgement, is consistent with procedural controls governing valve operation, and ensures correct valve positions.

SR 3.6.6.2

Operating each containment cooling train fan unit for ≥ 15 minutes ensures that all fan units are OPERABLE. It also ensures that abnormal conditions or degradation of the fan unit can be detected for corrective action. The 31 day Frequency was developed considering the known reliability of the fan units and controls, the two train redundancy available, and the low probability of significant degradation of the containment cooling train occurring between surveillances. It has also been shown to be acceptable through operating experience.

Insert 1

SR 3.6.6.3

Verifying that each containment cooling train ESW cooling flow rate is ≥ 2200 gpm provides assurance that the design flow rate assumed in the safety analyses will be achieved (Ref. 3). The Frequency was developed considering the known reliability of the Essential Service Water System, the two train redundancy available, and the low probability of a significant degradation of flow occurring between surveillances.

Insert 1

SR 3.6.6.4

Verifying each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by the ASME Code (Ref. 5). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test ensures that each pump develops a discharge pressure of greater than or equal to 250 psig. 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.5 and SR 3.6.6.6

These SRs require verification that each automatic containment spray valve actuates to its correct position and that each containment spray pump starts upon receipt of an actual or simulated actuation of a containment High-3 pressure signal.

This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

Insert 1 → The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.6.7

This SR requires verification that each containment cooling train actuates upon receipt of an actual or simulated safety injection signal. Upon actuation the fans start in slow speed or, if operating, shift to slow speed and the cooling flow rate increases to a value that enables each train of Containment Coolers to remove the heat load credited in the current Licensing Bases Containment Analysis. Currently, each train of Containment Coolers is credited to remove 141.4E6 BTU/hr under post-accident conditions. The determination of each train's heat removal capacity will be based upon flow, micro-fouling and macro-fouling.

Insert 1 → The 18 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience. See SR 3.6.6.5 and SR 3.6.6.6, above, for further discussion of the basis for the 18 month Frequency.

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.

Insert 1 → Due to the passive design of the nozzle, a test at 10 year intervals is considered adequate to detect obstruction of the nozzles.

(continued)

BASES

ACTIONS

A.1 (continued)

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 RFPC 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 additional time for attempting restoration of the RFPC System and is reasonable when considering the driving force for the release of radioactive material from the Reactor Coolant System is reduced in MODE 3.

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1

This SR verifies that the TSP-C baskets are in place and there is no evidence of structural distress or abnormal corrosion.

Insert 1

The 18 month Frequency is based on entry into the containment for routine refueling outages and the low probability of a reduction in TSP-C basket integrity during the SR interval.

SR 3.6.7.2

Periodic determination of the amount of TSP-C in containment must be performed due to the possibility of leaking valves and components in the containment building that could cause dissolution of the TSP-C during normal operation. This SR determines visually, by TSP-C level in each basket, that a minimum total amount of 9000 pounds of TSP-C is contained in the storage baskets and that the maximum amount of TSP-C in each basket does not exceed the structural integrity. Meeting this SR ensures that there is an adequate amount of TSP-C to adjust the pH of the post LOCA sump solution to a value ≥ 7.1.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.7.2 (continued)

Insert 1 →

The 18 month Frequency is based on entry into the containment for routine refueling outages and on the low probability of an undetected change in basket level. Operating experience has shown this surveillance frequency acceptable due to the margin in the volume of TSP placed in the containment building.

REFERENCES

1. FSAR, Chapter 6.5, and 6.2.2.

BASES

ACTIONS

B.1 and B.2 (continued)

low probability of the occurrence of a LOCA that would generate hydrogen in the amounts capable of exceeding the flammability limit.

C.1

If the inoperable hydrogen recombiner(s) 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. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.8.1

Performance of a system functional test for each hydrogen recombiner ensures the recombiners are operational and can attain and sustain the temperature necessary for hydrogen recombination. In particular, this SR verifies that the minimum heater air temperature increases to Š 1150 °F in ≤ 5 hours.

Insert 1 → Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.8.2

This SR ensures there are no physical problems that could affect recombiner operation. Since the recombiners are mechanically passive, they are not subject to mechanical failure. The only credible failure involves loss of power, blockage of the internal flow, missile impact, etc. A visual inspection is sufficient to determine abnormal conditions (i.e., loose wiring or structural connections; deposits of foreign materials, etc.) that could cause such failures. The 18 month Frequency for this SR was developed considering the incidence of hydrogen recombiners failing the SR in the past is low.

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.8.3

This SR which is performed following the functional test of SR 3.6.8.1, requires performance of a resistance to ground test for each heater phase to ensure that there are no detectable grounds in any heater phase. This is accomplished by verifying that the resistance to ground for any heater phase is ≥ 10,000 ohms.

Insert 1 → The 18 month Frequency for this Surveillance was developed considering the incidence of hydrogen recombiners failing the SR in the past is low.

REFERENCES

1. 10 CFR 50.44.
2. 10 CFR 50, Appendix A, GDC 41.
3. Regulatory Guide 1.7, Revision 2.
4. FSAR Section 6.2.5.

BASES

ACTIONS (continued)

I.1 and I.2

If the MSIVs cannot be restored to OPERABLE status or are not closed 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 at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that the closure time of each MSIV is within the limits of Figure B 3.7.2-1 from each actuator train when tested pursuant to the Inservice Test Program. The MSIV isolation time is assumed in the accident and containment analyses. Figure B 3.7.2-1 is a curve of the MSIV isolation time as a function of steam generator pressure, since there is no pressure indication available at the MSIVs. The acceptance curve for the MSIV stroke time is conservative enough to account for potential pressure differential between the steam generator pressure indication and pressure at the MSIVs. Meeting the MSIV isolation times in Figure B 3.7.2-1 ensures that the evaluation performed in Reference 8 remains valid. 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.

The Frequency is in accordance with the Inservice Testing Program.

SR 3.7.2.2

This SR verifies that each MSIV is capable of closure on an actual or simulated actuation signal. The manual fast close handswitch in the Control Room provides an acceptable actuation signal. Each actuation train must be tested separately. This Surveillance is normally performed upon returning the unit to operation following a refueling outage in conjunction with SR 3.7.2.1. However, it is acceptable to perform this surveillance individually. The frequency of MSIV testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. This Frequency is acceptable from a reliability standpoint.

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 (continued)

The Frequency for this SR is in accordance with the Inservice Testing Program.

SR 3.7.3.2

This SR verifies that each MFIV, MFRV, and MFRVBV is capable of closure on an actual or simulated actuation signal. For the MFIVs the manual fast close handswitch in the Control Room provides an acceptable actuation signal. Each MFIV actuation train must be tested separately. For the MFRVs and the MFRVBVs, actuation of solenoids locally at the MFRVs and MFRVBVs constitutes an acceptable simulated actuation signal.

This Surveillance is normally performed for the MFIVs and MFRVs upon returning the unit to operation following a refueling outage in conjunction with SR 3.7.3.1. The SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR for the MFRVs and MFRVBVs. This allows a delay of testing until MODE 3 to establish conditions consistent with those necessary to perform SR 3.7.3.1 and SR 3.7.3.2 concurrently for the MFRVs and for the MFRVBVs, as necessary.

Insert 1 → The 18 month Frequency for testing the MFIVs, MFRVs, and MFRVBVs per this SR is based on the refueling cycle and is acceptable from a reliability standpoint.

SR 3.7.3.3

This SR verifies that the closure time of each MFIV is within the limits of Figure B 3.7.3-1 from each actuation train when tested pursuant to the Inservice Testing Program. The MFIV closure time is assumed in the accident and containment analyses. Figure B 3.7.3-1 is a curve of the MFIV isolation time limit as a function of steam generator steam pressure, since there is no pressure indication available at the MFIVs. The acceptance curve for the MFIV stroke time conservatively accounts for the potential pressure differential between the steam generator pressure indication and the pressure at the MFIVs. Meeting the MFIV isolation times in Figure B 3.7.3-1 ensures that the evaluations performed in Reference 2 and Reference 7 remain valid. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. These valves should not be tested at power since even a partial stroke exercise increases the risk of a valve closure with the unit generating power.

(continued)

BASES

ACTIONS (continued)

D.1 and D.2

When Required Action A.1 or B.1 or C.1 cannot be completed within the required Completion Time, or if two AFW trains are inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 hours.

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

E.1

If all three AFW trains are inoperable, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a cooldown with nonsafety related equipment. In such a condition, the unit should not be perturbed by any action, including a power change, that might result in a trip. The seriousness of this condition requires that action be started immediately to restore one AFW train to OPERABLE status.

Required Action E.1 is modified by a Note indicating that all required MODE changes or power reductions are suspended until one AFW train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the unit into a less safe condition.

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. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. 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 capable of being mispositioned are in the correct position. ~~The 31 day Frequency is appropriate because the valves are operated under administrative control.~~ This SR does not apply to valves that cannot be inadvertently misaligned,

(continued)

BASES

SURVEILLANCE REQUIREMENT

SR 3.7.5.1 (continued)

such as check valves and relief valves. Additionally, vent and drain valves are not within the scope of this SR.

This SR is modified by a Note indicating that the SR is not required to be performed for the AFW flow control valves until the AFW system is placed in automatic control or when Thermal Power is above 10% RTP.

In order for the TDAFP and MDAFPs to be OPERABLE while the AFW system is in automatic control or above 10% RTP, the discharge flow control valves (ALHV0005, 6, 7, 8, 9, 10, 11, and 12) shall be in the full open position. The TDAFP and MDAFPs remain OPERABLE with the discharge flow control valves throttled to maintain steam generator levels during plant heatup, cooldown, or if started due to an Auxiliary Feedwater Actuation Signal (AFAS) or manually started in anticipation of an AFAS.

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

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 Code (Ref. 2). Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is performed on recirculation flow. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance.

Performance of inservice testing discussed in the ASME Code (Ref. 2) (only required at 3 month intervals) satisfies this requirement. The test Frequency in accordance with the Inservice Testing Program results in testing each pump once every 3 months, as required by Reference 2.

The required differential pressure for the AFW pumps when tested in accordance with the Inservice Testing Program is:

a. The acceptance criteria for the MDAFPs have been calculated using a limiting performance curve. The acceptance criteria, given as a table below, have been determined based on the Loss of

(continued)

BASES

SURVEILLANCE REQUIREMENT

SR 3.7.5.2 (continued)

Normal Feedwater (LONF) or Loss of Non-emergency AC Power (LOAC) events.

MOTOR driven PUMPS
ACCEPTANCE CRITERIA
(using performance curve)

Recirc. Flow (gpm)	Diff. Pressure (psid)
≥130	≥1543
≥150	≥1542
≥160	≥1539
≥170	≥1537

b. The acceptance criteria for the TDAFP has been calculated using a limiting performance curve. The acceptance criteria given as a table below, have been determined based on the Small Break Loss of Coolant Accident (SBLOCA) event.

TURBINE driven PUMP
ACCEPTANCE CRITERIA
(using performance curve)

Recirc. Flow (gpm)	Diff. Pressure (psid)
≥120	≥1628
≥140	≥1626

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

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 signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.3 (continued)

with the reactor at power. The 18 month Frequency is acceptable based on operating experience and the design reliability of the equipment.

Insert 1

This SR includes the requirement to verify that each AFW motor-operated discharge valve, ALHV0005, 7, 9 and 11, limits the flow from the motor-driven pump to each steam generator to ≤ 300 gpm (Reference 6) and that valves ALHV0030, 31, 32, 33, 34, 35 and 36 actuate to the required position upon receipt of an Auxiliary Feedwater Pump suction Pressure-Low signal.

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 AFAS by demonstrating that each AFW pump starts automatically on an actual or simulated auxiliary feedwater actuation signal. The ~~18 month Frequency is based~~ on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed ~~with the reactor at power.~~

Insert 1

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

SR 3.7.5.5

This SR verifies that the AFW system is properly aligned by verifying the flow paths from the CST to each steam generator prior to entering MODE 2 after more than 30 days in MODE 5 or 6.

OPERABILITY of AFW flow paths must be verified before sufficient core heat is generated that would require the operation of the AFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgement and other administrative controls that ensure that flow paths remain OPERABLE. To further ensure AFW System alignment, flow path OPERABILITY is verified following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the CST to the steam generators is properly aligned.

(continued)

BASES

ACTIONS

A1 and A.2 (continued)

low probability of an event occurring during this time period requiring the CST.

B.1 and B.2

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

Insert 1

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 contained water volume.

REFERENCES

1. FSAR, Section 9.2.6, Condensate Storage and Transfer System.
2. FSAR 10.4.9, Auxiliary Feedwater System.
3. FSAR 8.3A, Station Blackout.
4. FSAR, Appendix 5.4A, Safe Shutdown.

BASES (Continued)

ACTIONS

A.1

If one CCW train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function.

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," shall be entered if an inoperable CCW train results in an inoperable RHR loop. 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 reasonable, 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 CCW train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

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

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

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

Verifying the correct alignment for manual, power operated, and automatic valves in the CCW flow path servicing safety related equipment provides assurance that the proper flow paths exist for CCW operation.

This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. This 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 capable of being

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1 (continued)

mispositioned are in the correct position. ~~The 31 day Frequency is appropriate because the valves are operated under administrative control.~~ When either of the series isolation valves in the supply or return lines to/from the radwaste building loads is closed with power removed, this Surveillance no longer applies to the affected isolation valves since the valves would no longer be in the flow path. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves and relief valves. Additionally, vent and drain valves are not within the scope of this SR.

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, servicing safety related components or isolating nonsafety related components, on an actual or simulated actuation signal. This SR applies to the CCW valves that receive a Safety Injection signal and the RCP thermal barrier valves that receive a high CCW flow signal. When either of the series isolation valves in the supply or return lines to/from the radwaste building loads is closed with power removed, this Surveillance no longer applies to the affected isolation valves since the valves would no longer be in the flow path. 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. The

Insert 1 → 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated actuation signal. These actuation signals include Safety Injection and Loss of Power. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.3 (continued)

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

Insert 1

REFERENCES

1. FSAR, Section 9.2.2, Cooling System for Reactor Auxiliaries.
2. RFR 010060A.
3. TSTF-GG-05-01, "Writer's Guide for Plant-Specific Improved Technical Specifications," June 2005, Sections 4.1.3.b and 4.1.6.e.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1 (continued)

inoperable or non-functional, but does not affect the OPERABILITY of the ESW system.

Verifying the correct alignment for manual, power operated, and automatic valves in the ESW system flow path servicing safety related components provides assurance that the proper flow paths exist for ESW system operation.

This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. This 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 capable of being mispositioned are in the correct position. ~~The 31 day Frequency is appropriate because the valves are operated under administrative control.~~ When either of the series isolation valves in the supply or return lines to/from the normal service water system is closed with power removed, this Surveillance no longer applies to the affected isolation valves since the valves would no longer be in the flow path. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves and relief valves. Additionally, vent and drain valves are not within the scope of this SR.

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

SR 3.7.8.2

This SR verifies proper automatic operation of the ESW system valves servicing safety related components or isolating the nonsafety related components on an actual or simulated actuation signal. These actuation signals include Loss of Power, SIS, and Low AFW Suction Pressure coincident with an AFAS. When either of the series isolation valves in the supply or return lines to/from the normal service water system is closed with power removed, this Surveillance no longer applies to the affected isolation valves since the valves would no longer be in the flow path. The ESW system is a standby emergency system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.2 (continued)

are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience. Operating experience has shown that these components

Insert 1

usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.8.3

This SR verifies proper automatic operation of the ESW system pumps on an actual or simulated actuation signal. These actuation signals include SIS, Low AFW Suction Pressure coincident with an AFAS, and Loss of Power. The ESW system is a standby emergency system that cannot be fully actuated as part of normal testing during normal operation. The 18 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience. The ESW pump start on low AFW Suction Pressure Surveillance is performed under the conditions that apply during a unit outage and has the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually

Insert 1

pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section 9.2.1.2, Essential Service Water System.

2. FSAR, Section 6.2, Containment Systems.

3. FSAR, Section 5.4.7, Residual Heat Removal System.

4. TSTF-GG-05-01, "Writer's Guide for Plant-Specific Improved Technical Specifications," June 2005, Sections 4.1.3.b and 4.1.6.e.

BASES

ACTIONS

The 72 hour Completion Time is reasonable based on the low probability of an accident occurring during the 72 hours that one cooling tower train

A.1 (continued)

is inoperable, the number of available systems, and the time required to reasonably complete the Required Action.

B.1 and B.2

If the cooling tower train cannot be restored to OPERABLE status within the associated Completion Time, or if the UHS is inoperable for reasons other than Condition A, 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 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the ESW system pumps. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the UHS water level is ≥ 13.25 feet from the bottom of the UHS or 831.25 ft mean sea level.

Insert 1 →

SR 3.7.9.2

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

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.9.3

Operating each cooling tower fan in both the fast and slow speeds for ≥ 15 minutes ensures that all fans are OPERABLE and that all associated controls are functioning properly. It also ensures that fan or motor failure can be detected for corrective action. The 31 day Frequency is based on

Insert 1

SR 3.7.9.3 (continued)

operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the UHS cooling tower fans occurring between surveillances.

REFERENCES

1. FSAR, Section 9.2.5, Ultimate Heat Sink.
2. Regulatory Guide 1.27, Ultimate Heat Sink.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1 (continued)

train must be operated for ≥ 10 continuous hours with the heaters functioning. Functioning heaters will not necessarily have the heating elements energized continuously for 10 hours; but will cycle depending on the air temperature. Each filtration system train need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day Frequency is based on the reliability of the equipment and the two-train redundancy.

Insert 1

SR 3.7.10.2

This SR verifies that the required CREVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP).

The CREVS filter tests use the test procedure guidance in Regulatory Guide 1.52 (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 3.7.10.3

This SR verifies that each CREVS train starts and operates on an actual or simulated actuation signal. The actuation signal includes Control Room Ventilation Isolation or Fuel Building Ventilation Isolation. The CREVS train automatically switches on an actual or simulated CRVIS signal into a CRVIS mode of operation with flow through the HEPA filters and charcoal adsorber banks. The Surveillance Requirement also verifies that a control room ventilation isolation signal (CRVIS) will be received by the LOCA sequencer to enable an automatic start of the Diesel Generator loads that are associated with a CRVIS. Verification that these loads will start and operate at the appropriate step in the LOCA sequencer and that other auto-start signals for these loads will be inhibited until the LOCA sequencer is reset is accomplished under Surveillance Requirement SR 3.8.1.12. The Frequency of 18 months is consistent with the typical operating cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

Insert 1

(continued)

BASES

ACTIONS

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

and that active failures will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

D.1 and D.2

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

E.1

If both CRACS trains are inoperable in MODE 1, 2, 3, or 4, the CRACS may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the heat removal capability of the CRACS air conditioning units is adequate to remove the heat load assumed in the control room during design basis accidents. This SR consists of verifying the heat removal capability of the condenser heat exchanger (either through performance testing or inspection), ensuring the proper operation of major components in the refrigeration cycle and verification of unit air flow capacity. The 18 month Frequency is appropriate since significant degradation of the CRACS is slow and is not expected over this time period.

Insert 1

REFERENCES

1. FSAR, Section 9.4.1, Control Building HVAC.

BASES

ACTIONS (continued)

D.1 and D.2

When Required Action A.1 cannot be completed within the associated Completion Time during movement of irradiated fuel assemblies in the fuel building, the OPERABLE Emergency Exhaust System train must be immediately started in the FBVIS mode per Required Action D.1. This action ensures that no undetected failures preventing system operation exist, and that any active failure will be readily detected.

An alternative to Required Action D.1 is to immediately suspend movement of irradiated fuel assemblies in the fuel building per Required Action D.2. This precludes activities that could result in a fuel handling accident and the associated release of radioactivity that might require operation of the Emergency Exhaust System. This action does not preclude the movement of fuel assemblies to a safe position.

E.1

When two trains of the Emergency Exhaust System are inoperable during movement of irradiated fuel assemblies in the fuel building, action must be taken to place the unit in a condition in which the LCO does not apply. Action must be taken immediately to suspend movement of irradiated fuel assemblies in the fuel building. This does not preclude the movement of fuel to a safe position. This condition only applies to the EES components required to support the FBVIS mode of operation, including the fuel building pressure boundary.

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

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

Monthly heater operation dries out any moisture accumulated in the charcoal from humidity in the ambient air. Each Emergency Exhaust System train must be operated for ≥ 10 continuous hours with the heaters functioning. Functioning heaters would not necessarily have the heating elements energized continuously for 10 hours, but will cycle depending on the temperature. The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available. This SR can be satisfied with the EES in the SIS or FBVIS lineup during testing.

Insert 1 →

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.2

This SR verifies that the required Emergency Exhaust System filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The Emergency Exhaust System filter tests are in accordance with Regulatory Guide 1.52 (Ref. 7). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.13.3

This SR verifies that each Emergency Exhaust System train starts and operates on an actual or simulated actuation signals. These actuation signals include a Safety Injection Signal (applicable in MODE 1, 2, 3 and 4) and high radiation signal from the Fuel Building Exhaust Radiation – Gaseous channels (applicable during movement of irradiated fuel in the fuel building). The 18 month Frequency is consistent with the typical operating cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

During emergency operations the Emergency Exhaust System will automatically start in either the SIS or FBVIS lineup depending on the initiating signal. In the SIS lineup, the fans operate with dampers aligned to exhaust from the Auxiliary Building and prevent unfiltered leakage. In the FBVIS lineup, which is initiated on a high radiation signal from the Fuel Building Exhaust Radiation – Gaseous channels, the fans operate with the dampers aligned to exhaust from the Fuel Building to prevent unfiltered leakage. Normal exhaust air from the Fuel Building is continuously monitored by radiation detectors. One detector output will automatically align the Emergency Exhaust System in the FBVIS mode of operation. This surveillance requirement demonstrates that each Emergency Exhaust System train can be automatically started and properly configured to the FBVIS or SIS alignment, as applicable, upon receipt of an actual or simulated SIS signal and an FBVIS signal. It is not required that each Emergency Exhaust System train be started from both actuation signals during the same surveillance test provided each actuation signal is tested independently ~~within the 18 month test frequency.~~

Insert 2

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.4

This SR verifies the integrity of the auxiliary building enclosure. The ability of the auxiliary building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the Emergency Exhaust System. During the SIS mode of operation, the Emergency Exhaust System is designed to maintain a slight negative pressure in the auxiliary building, to prevent unfiltered leakage. The Emergency Exhaust System is designed to maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure at the flow rate specified in the VFTP. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 7).

Insert 1

SR 3.7.13.5

This SR verifies the integrity of the fuel building enclosure. The ability of the fuel building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the Emergency Exhaust System. During the FBVIS mode of operation, the Emergency Exhaust System is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered leakage. The Emergency Exhaust System is designed to maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure at the flow rate specified in the VFTP. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 7).

Insert 1

REFERENCES

1. FSAR, Section 6.5.1, Engineered Safety Features (ESF) Filter Systems.

2. FSAR, Section 9.4.2, Fuel Building HVAC.

3. FSAR, Section 9.4.3, Auxiliary Building HVAC.

4. FSAR, Section 15.7.4, Fuel Handling Accidents.

5. Regulatory Guide 1.25, Rev. 0, Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors.

(continued)

BASES (Continued)

LCO

The fuel storage pool water level is required to be ≥ 23 ft over the top of the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 3). As such, it is the minimum required for fuel movement within the fuel storage pool.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the fuel storage pool, since the potential for a release of fission products exists. The reconstitution of irradiated fuel assemblies is also considered movement of irradiated fuel.

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 fuel storage pool water level is lower than the required level, the movement of irradiated fuel assemblies in the fuel storage pool is immediately suspended. This action effectively precludes the occurrence of a fuel handling accident. 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 verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the fuel storage 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 A

During refueling operations, the level in the fuel storage pool is in equilibrium with the refueling pool, and the level in the refueling pool is checked daily in accordance with SR 3.9.7.1.

(continued)

BASES (Continued)

ACTIONS

A.1, A.2.1, and A.2.2

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

When the concentration of boron in the 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. The concentration of boron is restored simultaneously with suspending movement of fuel assemblies. An acceptable alternative is to verify by administrative means that the fuel storage pool verification has been performed since the last movement of fuel assemblies in the fuel storage pool. However, prior to resuming movement of fuel assemblies, the concentration of boron must be restored. This does not preclude movement of a fuel assembly to a safe position.

If the LCO is not met while moving fuel assemblies in MODE 5 or 6, LCO 3.0.3 would not be applicable. If moving fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, 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 that the concentration of boron in the fuel storage pool is within the required limit. As long as this SR is met, the analyzed accidents are fully addressed. The 7 day Frequency is appropriate because no major replenishment of pool water is expected to take place over such a short period of time.

Insert 1

REFERENCES

1. Callaway FSAR, Appendix 9.1A, "The High Density Rack (HDR) Design Concept."
2. Amendment No. 129 dated January 19, 1999 to the Callaway Operating License.
3. 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).

BASES

ACTIONS

A.1 and A.2 (continued)

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 15.1.5, Steam System Piping Failure.

BASES

SURVEILLANCE REQUIREMENTS (continued)

to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. This value provided for the OPERABILITY of all required loads as shown by load flow calculations in support of NRC Branch Technical Position PSB-1. The specified maximum steady state output voltage of 4320 V ensures that for a lightly loaded distribution system, the voltage at the terminals of motors and other equipment is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

SR 3.8.1.1

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 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. For SR 3.8.1.7 the DGs are started using one of the following signals: 1) manual, or 2) simulated loss of offsite power by itself, or 3) safety injection test signal. Standby

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 3, which is only applicable when such modified start procedures are recommended by the manufacturer.

SR 3.8.1.7 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency within 12 seconds. The 12 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR, Chapter 15 (Ref. 5).

The 12 second start requirement is not applicable to SR 3.8.1.2 (see Note 3) when a modified start procedure as described above is used. If a modified start is not used, the 12 second start requirement of SR 3.8.1.7 applies. Since SR 3.8.1.7 requires a 12 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

Insert 1 →

The normal 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 7). These Frequencies provide adequate assurance of 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 and aligned to provide standby power to the associated emergency buses. A minimum run time of 60 minutes provides adequate time 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.3 (continued)

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

The DG is considered OPERABLE during performance of the Surveillance, i.e., while it is paralleled to the offsite power source, consistent with the Technical Evaluation contained in the Safety Evaluation provided for OL Amendment 162 (Reference 16), which includes consideration of the potential challenges to the DG and its response to a LOCA and/or a loss of offsite power, while it is paralleled to the offsite power source for testing.

Insert 1 →

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

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients, 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 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 fuel oil transfer pump starts on low level in the day tank standpipe to automatically maintain the day tank fuel oil level above the DG fuel headers. The minimum fuel oil free surface elevation is required to be at least 130 inches above the baseline of the diesel generator skid. The transfer pump start/stop setpoints are controlled to maintain level in the standpipe in order to ensure there is sufficient fuel to meet the 12 second start requirement for the DG. This level also ensures adequate fuel oil for a minimum of 1 hour of DG operation at full load plus 10%.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.4 (continued)

Insert 1 →

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

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day tanks once every 31 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. 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.

Insert 1 →

SR 3.8.1.6

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

Insert 1 →

The Frequency for this SR is 31 days.

SR 3.8.1.7

See SR 3.8.1.2.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.8

Not Used

SR 3.8.1.9

Not Used

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences 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 continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

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 ≥ 0.8 and ≤ 0 9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

Simulated test conditions for the load rejection per this Surveillance may involve paralleling the DG to the offsite power source to establish the required load. The DG is considered OPERABLE while it is paralleled to the offsite power source, consistent with the Technical Evaluation contained in the Safety Evaluation provided for OL Amendment 162 (Reference 16), which includes consideration of the potential challenges to the DG and its response to a LOCA and/or a loss of offsite power, while it is paralleled to the offsite power source for testing.

Insert 1 →

The 18 month Frequency for this Surveillance is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9) and is intended to be consistent with expected fuel cycle lengths.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert 1 →

The Frequency of 18 months is consistent with the recommendations 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.

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 continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

The Note 2 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.

SR 3.8.1.12

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

(12 seconds) from the design basis actuation signal (SI signal) and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on a safety injection signal without loss of offsite power.

The requirement to verify the connection of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG 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 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

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 continuously circulated and temperature maintained consistent with manufacturer recommendations. 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.

The Note 2 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

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.

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions are bypassed on a loss of voltage signal concurrent with safety injection signal. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

Insert 1 →

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

SR 3.8.1.14

Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours. If the auto-connected design loads have increased above the continuous duty rating the load shall be increased to 110% of the continuous duty rating for ≥ 2 hours 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 ≥ 0.8 and ≤ 0.9. 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. The generator voltage and frequency is maintained within 4160 + 160 - 420 volts and 60 ± 1.2 Hz during this test.

Administrative controls for performing this Surveillance in MODES 1 or 2 with the DG connected to the offsite power supply ensure or require that:

a. Weather conditions are conducive for performing the Surveillance.

b. The offsite power supply and switchyard conditions are conducive for performing the Surveillance, which includes ensuring that switchyard access is restricted and no effective maintenance within the switchyard is performed

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

The DG is considered OPERABLE during performance of the Surveillance, i.e., while it is paralleled to the offsite power source, consistent with the Technical Evaluation contained in the Safety Evaluation provided for OL Amendment 162 (Reference 16), which includes consideration of the potential challenges to the DG and its response to a LOCA and/or loss of offsite power, while it is paralleled to the offsite power source for testing.

Insert 1 →

The 18 month Frequency for this Surveillance is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by two Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test. The reason for Note 2 is that operating the DG for greater than 2 hours in the overloaded condition need not be performed, provided the auto-connected loads remain below the 6201 KW continuous rating of the DG.

(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 the required voltage and frequency within 12 seconds. The 12 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 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 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 automatic load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs.

The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

Insert 1 →

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), and takes into consideration unit conditions required to perform the Surveillance.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.16 (continued)

The restriction from normally performing the Surveillance in MODE 1, 2, 3, or 4 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post-work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1, 2, 3 or 4. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a safety injection signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 13), paragraph 6.2.6(2).

The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.12. The intent in the requirement associated with SR 3.8.1.17.b is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable.

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

Insert 1 →

The 18 month Frequency is consistent with the recommendations 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.

The 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.

SR 3.8.1.18

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

Insert 1 →

The Frequency of 18 months is consistent with the recommendations 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.18 (continued)

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

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

This SR is modified by 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 continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

The Note 2 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.

The ESW pump starting transient during the LOCA sequencing test, will be demonstrated to be within a minimum voltage of 3120 Vac and to recover to 3680 Vac within 3 seconds and to be within a maximum voltage of 4784 Vac and recover to 4320 Vac within 2 seconds. This is based on Regulatory Guide 1.9 Revision 3 Section 1.4 and past trending of ESW pump starting transient performance (Refs. 14 and 15).

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 continuously circulated and temperature maintained consistent with manufacturer recommendations.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.21

SR 3.8.1.21 is the performance of an ACTUATION LOGIC TEST for each Load Shedder and Emergency Load Sequencer train, except that the continuity check does not have to be performed, as explained in the Note. This test is performed every 31 days on a STAGGERED TEST BASIS. The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data.

Insert 1 →

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Chapter 8.
3. Regulatory Guide 1.9, Rev. 3, July 1993.
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. 0, January. 1978.
11. ANSI C84.1 - 1982.
12. IEEE Standard 308-1978.
13. ULNRC-3244, dated July 25, 1995.
14. ULNRC-3342, dated February 28, 1996.
15. OL Amendment No. 112, dated August 4, 1996.
16. OL Amendment No. 162, dated June14, 2004.

BASES

ACTIONS

F.1 (continued)

limits and not within limits specified by Conditions A through E, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for 7 days at full load. 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 full load operation for each DG. The 750 gal requirement is based on the DG manufacturer consumption values for the run time of the DG. There are several methods available to verify a lube oil volume greater than or equal to 750 gallons. The preferred method is to verify that lube oil level is greater than the required inventory with the engine dipstick. Other indirect methods, such as the local level indicator or the absence of a low level alarm are acceptable as alternate methods.

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 tank(s), but in no case is the time between receipt of new fuel and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.3 (continued)

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. The filter size for the determination of particulate contamination will be 3.0 micron nominal instead of 0.8 micron nominal as specified by ASTM D2276-78, Method A (Ref. 6). It is acceptable to contamination will be 3.0 micron nominal instead of 0.8 micron nominal as specified by ASTM D2276-78, Method A (Ref. 6). It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing.

SR 3.8.3.4

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.

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 five engine start cycles without recharging. A start cycle is defined as 3 seconds of cranking time or approximately 2 to 3 engine revolutions. The pressure specified in this SR is intended to reflect the lowest value at which the five 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 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,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.5 (continued)

rain water, and contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established 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 SR is not applicable.

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-; D975-81; D1796-83; D1552-79; D2622-82; D2276, Method A, D4294-90, D1298-85.
7. ASTM Standards, D975, Table 1.
8. ASME, Boiler and Presser Vessel Code, Section XI.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1 (continued)

internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The 7 day Frequency is consistent with IEEE-450 (Ref. 9).

Insert 1 →

SR 3.8.4.2

Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each intercell, and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The visual inspection is to detect corrosion in cell post connection area; corrosion outside the connection area is not an OPERABILITY concern and would not require measuring resistance.

Insert 1 →

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

SR 3.8.4.3

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

Insert 1 →

The 18 month Frequency for this SR is based on operational experience.

SR 3.8.4.4 and SR 3.8.4.5

Visual inspection and resistance measurements of intercell, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anticorrosion material is used to help ensure good electrical connections

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.4 and SR 3.8.4.5 (continued)

and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection. The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during performance of SR 3.8.4.4.

Insert 1 →

The Surveillance Frequencies of 18 months are based on operational experience.

SR 3.8.4.6

This SR requires that each battery charger be capable of supplying 300 amps and 130.2 V for ≥ 1 hour. These requirements are based on the design rating of the chargers (Ref. 4) and the time needed to reach thermal equilibrium. According to Regulatory Guide 1.32 (Ref. 10), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

Insert 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 18 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.7

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

Insert 1 →

The Surveillance Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 10) and Regulatory Guide 1.129 (Ref. 11), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests, not to exceed 18 months.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.8 (continued)

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 9) 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.

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 life the Surveillance Frequency is reduced to 18 months. Degradation is indicated, according to IEEE-450 (Ref. 9), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is below 90% of the manufacturer's rating.

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. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE-308-1978.
4. FSAR, Chapter 8.
5. IEEE-485-1983, June 1983.
6. FSAR, Chapter 6.
7. FSAR, Chapter 15.
8. Regulatory Guide 1.93, December 1974.
9. IEEE-450-1995.
10. Regulatory Guide 1.32, February 1977.
11. Regulatory Guide 1.129, February 1978.

BASES

ACTIONS

A.1, A.2, and A.3 (continued)

connected cell. Taking into consideration both the time required to perform the required verification and the assurance that the battery cell parameters are not severely degraded, this time is considered reasonable. The verification is repeated at 7 day intervals until the parameters are restored to Category A or B limits.

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

B.1

With one or more batteries with one or more battery cell parameters outside the Category C limit for any connected cell, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding DC electrical power subsystem must be declared inoperable. Additionally, other potentially extreme conditions, such as not completing the Required Actions of Condition A within the required Completion Time or average electrolyte temperature of representative cells falling below 60°F, are also cause for immediately declaring the associated battery inoperable. IEEE 450 suggests that representative cells be interpreted to mean every sixth cell.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

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

Insert 1 →

SR 3.8.6.2

The quarterly inspection of battery cell parameters is consistent with IEEE-450 (Ref. 3). In addition, within 7 days of a battery discharge with terminal voltage < 110 V or a battery overcharge with terminal voltage > 150 V, the battery must be demonstrated to meet Category B limits. Transients, such as motor starting transients, which may momentarily

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.2 (continued)

cause battery voltage to drop to < 110 V, do not constitute a significant battery discharge provided the battery terminal voltage and float current return to pre-transient values. This inspection is also consistent with IEEE-450 (Ref. 3), which recommends special inspections following a severe discharge or overcharge, to ensure that no significant degradation of the battery occurs as a consequence of such discharge or overcharge.

Insert 1 →

SR 3.8.6.3

This Surveillance verification that the average temperature of representative cells is ≥ 60°F, is consistent with a recommendation of IEEE-450 (Ref. 3), that states that the temperature of electrolytes in representative cells should be determined on a quarterly basis. IEEE 450 suggests that representative cells be interpreted to mean every sixth cell.

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

Insert 1 →

Table 3.8.6-1

This table delineates the limits on battery cell parameters for three different categories. The meaning of each category is discussed below.

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

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 3), with the extra ¼ inch allowance above the high level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote a to Table 3.8.6-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits ensure that the plates suffer no physical damage, and that adequate electron transfer capability is maintained in the event of transient conditions. IEEE-450 (Ref. 3) recommends that electrolyte level readings should be made only after the battery has been at float charge for at least 72 hours.

(continued)

BASES (Continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

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 of the RTS 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 8.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.

BASES

ACTIONS (continued)

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

By the allowance of the option to declare required features inoperable with the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6)). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

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 inverters and to continue this action until restoration is accomplished in order to provide the necessary 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 the inverter internal AC source or the constant voltage 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 AC vital buses. The 7 day Frequency takes into account the capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

Insert 1 →

(continued)

BASES

ACTIONS (continued)

E.1

With two trains 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 AC, DC, and AC 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 AC vital bus 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. Regulatory Guide 1.93, December 1974.

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5 (continued)

is accomplished in order to provide the necessary power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required residual heat removal (RHR) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the RHR ACTIONS would not be entered. Therefore, Required Action A.2.5 is provided to direct declaring RHR inoperable and not in operation, which results in taking the appropriate RHR actions. This would assure consideration is given to shutdown cooling systems that are without required power and that appropriate actions are taken to assure operability of these required systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power.

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the required AC, DC, and AC vital bus electrical power distribution subsystems are functioning properly, with 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. FSAR, Section 3.1.2.

BASES

ACTIONS

A.1 and A.2 (continued)

the refueling pool that have direct access to the reactor vessel, 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 and the refueling pool that have direct access to the reactor vessel, is within the LCO 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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1 (continued)

The likelihood of a significant reduction in the boron concentration during MODE 6 operations is remote due to the large mass of borated water in the refueling pool after flood-up and the fact that all unborated water sources are isolated, precluding a dilution. The boron concentration is checked every 72 hours during MODE 6 under SR 3.9.1.1. This Surveillance demonstrates that the valves are closed through a system walkdown. The 31 day Frequency is based on engineering judgment and is considered reasonable in view of other administrative controls that will ensure that the valve opening is an unlikely possibility.

Insert 1

REFERENCES

1. FSAR, Section 15.4.6.
2. NUREG-0800, Section 15.4.6.
3. Amendment 97 to Facility Operating License No. NPF-30, Callaway Unit 1, dated March 31, 1995.

BASES

ACTIONS

B.2 (continued)

stabilized until the source range neutron flux monitors are OPERABLE. This stabilized condition is determined by performing SR 3.9.1.1 to ensure that the required boron concentration exists.

The Completion Time of once per 12 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration and ensures that unplanned changes in boron concentration would be identified. The 12 hour Frequency is reasonable, considering the low probability of a change in core reactivity during this time period.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

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.

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.

SR 3.9.3.2

SR 3.9.3.2 is the performance of a CHANNEL CALIBRATION ~~every 18 months.~~ This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. Neutron detectors are excluded from the CHANNEL CALIBRATION because it is impractical to set up a test that demonstrates and adjusts neutron detector response to known values of the parameter (neutron flux) that the channel monitors. Depending on which source range channels are used to satisfy the LCO, the Note applies to the source range proportional counters in the Westinghouse Nuclear Instrumentation System (NIS) or to the Gamma-Metrics fission chambers, as discussed in the Background and LCO sections above. The CHANNEL CALIBRATION of the Westinghouse NIS source range neutron flux channels consists of obtaining integral bias curves, evaluating those curves, and comparing the curves previous data. The 18 month Frequency is based on the need to obtain integral bias curves under the conditions that apply during a plant outage. The other remaining portions of the CHANNEL CALIBRATION may be performed either during a plant outage or during

Insert 11

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.3.2 (continued)

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

REFERENCES

1. 10 CFR 50, Appendix A, GDC 13, GDC 26, GDC 28, and GDC 29.
2. FSAR, Section 15.4.6.

BASES

ACTIONS

A.1 and A.2 (continued)

to the outside atmosphere is not in the required status, including the Containment Purge Isolation System not capable of manual actuation when the isolation valves are open, the unit must be placed in a condition where the isolation function is not needed. This is accomplished by immediately suspending CORE ALTERATIONS and movement of irradiated fuel assemblies within containment. Performance of these actions shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. For the open purge isolation valves, this Surveillance will ensure that each valve is not blocked from closing and each valve operator has motive power by demonstrating that each valve actuates to its isolation position on manual actuation of the 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. 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 outside atmosphere.

SR 3.9.4.2

This Surveillance demonstrate that the necessary hardware, tools, and equipment are available to install the equipment hatch. The equipment hatch is provided with a set of hardware, tools, and equipment for moving the hatch from its storage location and installing it in the opening. The required set of hardware, tools, and equipment shall be inspected to ensure that they can perform the required functions.

The Surveillance is performed ~~every 7 days~~ during CORE ALTERATIONS or movement of irradiated fuel assemblies within the containment. ~~The Surveillance interval is selected to be commensurate with the normal duration of the time to complete the fuel handling operations.~~ The Surveillance is modified by a Note that only requires that the Surveillance be met for an open equipment hatch. If the equipment hatch is installed

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.4.2 (continued)

in its opening, the availability of the means to install the hatch is not required. The 7 day Frequency is adequate considering that the hardware, tools, and equipment are dedicated to the equipment hatch and not used for any other function.

Insert 1

SR 3.9.4.3

This Surveillance demonstrates that each containment purge isolation valve actuates to its isolation position on manual initiation The 18 month Frequency maintains consistency with other similar ESFAS instrumentation and valve testing requirements. In LCO 3.3.6, the Containment Purge Isolation instrumentation requires a CHANNEL CHECK every 12 hours, an ACTUATION LOGIC TEST every 31 days on a STAGGERED TESTS BASIS, and a COT every 92 days to ensure the channel OPERABILITY during MODES 1, 2, 3, and 4. Every 18 months a TADOT and a CHANNEL CALIBRATION are performed. The system actuation response time is demonstrated every 18 months 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 will ensure that the valves are capable of being manually closed after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

Insert 1

REFERENCES

1. Amendment 114 to Facility Operating License No. NPF-30, Callaway Unit 1, dated July 15, 1996.

2. FSAR, Section 15.7.4.

3. NUREG-0800, Section 15.7.4, Rev. 1, July 1981.

4. Amendment 138 to Facility Operating License No. NPF-30, Callaway Unit 1, dated September 26, 2000.

BASES

ACTIONS (continued)

A.3

If RHR loop requirements are not met, actions shall be initiated and continued in order to satisfy RHR loop requirements. With the unit in MODE 6 and the refueling water level ≥ 23 ft above the top of the reactor vessel flange, corrective actions shall be initiated immediately.

A.4

If RHR loop requirements are not met, 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 dose limits are not exceeded.

The Completion Time of 4 hours is reasonable, based on the low probability of the coolant boiling in that time.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1

This Surveillance demonstrates that the RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to prevent thermal and boron stratification in the core. The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator in the control room for monitoring the RHR System.

Insert 1

REFERENCES

1. FSAR, Section 5.4.7.

BASES

ACTIONS

B.3 (continued)

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, additional actions are taken to provide containment closure in a reduced period of time (Reference 2). Reduced inventory is defined as RCS level lower than 3 feet below the reactor vessel flange.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

This Surveillance demonstrates that one RHR loop is in operation and circulating reactor coolant. The flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability and to prevent thermal and boron stratification in the core. The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator for monitoring the RHR System in the control room.

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

REFERENCES

1. FSAR, Section 5.4.7.

2. Generic Letter No. 88-17, "Loss of Decay Heat Removal."

3. RFR-15632A.

BASES (Continued)

LCO

A minimum refueling pool water level of 23 ft above the top of the reactor vessel flange is required to ensure that the radiological consequences of a postulated fuel handling accident inside containment are within acceptable limits, as provided by the guidance of Reference 3.

APPLICABILITY

LCO 3.9.7 is applicable when moving irradiated fuel assemblies within containment. Proper removal and reinstallation of the upper internals with irradiated fuel in the vessel does not constitute movement of irradiated fuel, therefore, this LCO is not applicable during installation and removal of the reactor vessel upper internals.

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, 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.

(continued)

Proposed No Significant Hazards Consideration

PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION

Description of Amendment Request: The change requests the adoption of an approved change to the standard technical specifications (STS) for Westinghouse Plants (NUREG-1431), to allow relocation of specific TS surveillance frequencies to a licensee-controlled program. The proposed change is described in Technical Specification Task Force (TSTF) Traveler, TSTF-425, Revision 3 (ADAMS Accession No. ML090850642) related to the Relocation of Surveillance Frequencies to Licensee Control—RITSTF Initiative 5b and was described in the Notice of Availability published in the Federal Register on July 6, 2009 (74 FR 31996).

The proposed changes are consistent with NRC-approved Industry/Technical Specification Task Force (TSTF) Traveler, TSTF-425, Rev. 3, "Relocate Surveillance Frequencies to Licensee Control—RITSTF Initiative 5b." The proposed change relocates surveillance frequencies to a licensee-controlled program, the Surveillance Frequency Control Program (SFCP). This change is applicable to licensees using probabilistic risk guidelines contained in NRC-approved NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," (ADAMS Accession No. 071360456).

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

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

   Response: No

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

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

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

   Response: No

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

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

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

   Response: No

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

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

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

ULNRC- 05725
Attachment 7

TSTF-425 (NUREG-1431) vs. Callaway Plant TS Cross-Reference

TSTF-425 (NUREG-1431) vs. Callaway Cross-Reference

This table provides a comparison of the provisions of TSTF-425, as they apply to Standard Technical Specifications (TS) for Westinghouse Plants (NUREG 1431, Revision 3A) and this Initiative 5b application to the Callaway Plant TS.

- The first column lists the TS Section Title/Surveillance Description for each section and each surveillance in TSTF-425 and the Callaway TS. It contains an excerpt which describes the subject of each surveillance. (Section 3.2 only addresses those power distribution methodologies that are applicable to Callaway.)
- The second and third columns list the TSTF and the corresponding Callaway TS surveillance numbers.
- The fourth column lists the Callaway TS page number though NRC approved amendment 200.
- The fifth column indicates if this application is modifying a particular section or surveillance. If it is modified it will indicate if the surveillance frequency is completely relocated of a portion is relocated. If not relocated, it will indicate if it is due to the surveillance frequency being event driven if the frequency is governed by another program. A list of abbreviations used is provided following each table section.

Bolding is used in the second through fifth columns to highlight differences between TSTF-425 and the Callaway TS due to the specific design of the Callaway Plant and the resultant structure of the Callaway TS.

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Definition - Staggered Test Basis	1.1	1.1	1.1-6	Y
Safety Limits (SLs)	N/A	2.0	2.0-1	N
Limiting Condition For Operation (LCO) Applicability	N/A	3.0	3.0-1	N
Shutdown Margin (SDM)				
Verify SDM within limits...	SR 3.1.1.1	SR 3.1.1.1	3.1-1	Y
Core Reactivity				
Verify reactivity within...of predicted values...	SR 3.1.2.1	SR 3.1.2.1	3.1-3	Y (p)
Moderator Temperature Coefficient (MTC)				
Verify MTC is within upper limit	N/A	SR 3.1.3.1	3.1-5	N (ed)
Verify MTC is within lower limit	N/A	SR 3.1.3.2	3.1-5	N (ed)
Rod group Alignment Limits				
Verify individual rod positions within alignment limit.	SR 3.1.4.1	SR 3.1.4.1	3.1-10	Y
Verify rod freedom of movement...	SR 3.1.4.2	SR 3.1.4.2	3.1-10	Y
Verify rod drop time of each rod...	N/A	SR 3.1.4.3	3.1-10	N (ed)

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Shutdown Bank (SB) Insertion Limits				
Verify each SB is within the...limits...	SR 3.1.5.1	SR 3.1.5.1	3.1-12	Y
Control Bank (CB) Insertion Limits				
Verify estimated critical CB position is within the limits...	N/A	SR 3.1.6.1	3.1-14	N (ed)
Verify each CB insertion is within the limits...	SR 3.1.6.2	SR 3.1.6.2	3.1-14	Y
Verify sequence and overlap limits...	SR 3.1.6.3	SR 3.1.6.3	3.1-15	Y
Rod Position Indication				
Verify each DRPI agrees within 12 steps of the group demand position...	N/A	SR 3.1.7.1	3.1-18	N (ed)
PHYSICS TESTS Exceptions - MODE 2				
Perform a COT on PR and IR channels...	N/A	SR 3.1.8.1	3.1-20	N (ed)
Verify the RCS lowest operating loop average temperature is ...	SR 3.1.8.2	SR 3.1.8.2	3.1-20	Y
Verify THERMAL POWER is ≤ 5% RTP.	SR 3.1.8.3	SR 3.1.8.3	3.1-20	Y
Verify SDM is within limits...	SR 3.1.8.4	SR 3.1.8.4	3.1-20	Y
The boron concentration of the RCS > all rods out critical boron concentration				
Verify RCS boron concentration...	----------	**SR 3.1.9.1**	**3.1-22**	**Y**

p- Partial
ed – Event Driven

Technical Specification Section Title/ Surveillance Description (Section 3.2 only addresses those power distribution methodologies (RAOC) that are applicable to Callaway Plant.)	**TSTF-425**	**Callaway**	**Cal TS Page #**	**Applicability of 5b**
Heat Flux Hot Channel Factor ($F_Q(Z)$)(F_Q Methodology) (RAOC-W(Z) Methodology)				
Verify $F_Q^C(Z)$ is within limit	SR 3.2.1.1	SR 3.2.1.1	3.2-3	Y (p)
Verify $F_Q^W(Z)$ is within limit	SR 3.2.1.2	SR 3.2.1.2	3.2-5	Y (p)
Nuclear Enthalpy Rise Hot Channel Factor ($F_{\Delta H}^N$)				
Verify $F_{\Delta H}^N$ is within limits…	SR 3.2.2.1	SR 3.2.2.1	3.2-8	Y (p)
AFD (RAOC) Methodology				
Verify AFD within limits for each OPERABLE excore channel.	SR 3.2.3B.1	SR 3.2.3.1	3.2-9	Y
Quadrant Power Tilt Ratio (QPTR)				
Verify QPTR is within limit by calculation	SR 3.2.4.1	SR 3.2.4.1	3.2-13	Y
Verify QPTR is within limit using…	SR 3.2.4.2	SR 3.2.4.2	3.2-13	Y

p-Partial

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
The RTS instrumentation				
Perform CHANNEL CHECK	SR 3.3.1.1	SR 3.3.1.1	3.3-12	Y
Compare results of calorimetric heat balance calculation to PR channel output...	SR 3.3.1.2	SR 3.3.1.2	3.3-12	Y
Compare results of the income power distribution measurements to NIS AFD...	SR 3.3.1.3	SR 3.3.1.3	3.3-12	Y
Perform TADOT	SR 3.3.1.4	SR 3.3.1.4	3.3-13	Y (stb)
Perform ACTUATION LOGIC TEST	SR 3.3.1.5	SR 3.3.1.5	3.3-13	Y (stb)
Calibrate excore channels to agree with incore power distribution measurements	SR 3.3.1.6	SR 3.3.1.6	3.3-13	Y
Perform COT	SR 3.3.1.7	SR 3.3.1.7	3.3-13	Y
Perform COT	SR 3.3.1.8	SR 3.3.1.8	3.3-14	Y (p)
Perform TADOT	SR 3.3.1.9	SR 3.3.1.9	3.3-15	Y
Perform CHANNEL CALIBRATION	SR 3.3.1.10	SR 3.3.1.10	3.3-15	Y
Perform CHANNEL CALIBRATION	SR 3.3.1.11	SR 3.3.1.11	3.3-15	Y
Perform CHANNEL CALIBRATION	**SR 3.3.1.12**	**SR 3.3.1.12**	**3.3-15**	**Not Used**
Perform COT	SR 3.3.1.13	SR 3.3.1.13	3.3-16	Y
Perform TADOT	SR 3.3.1.14	SR 3.3.1.14	3.3-16	Y
Perform TADOT	SR 3.3.1.15	SR 3.3.1.15	3.3-16	N (ed)
Verify RTS RESPONSE TIMES are within limits	SR 3.3.1.16	SR 3.3.1.16	3.3-16	Y
ESFAS Instrumentation				
Perform CHANNEL CHECK	SR 3.3.2.1	SR 3.3.2.1	3.3-34	Y
Perform ACTUATION LOGIC TEST	SR 3.3.2.2	SR 3.3.2.2	3.3-34	Y (stb)
Perform ACTUATION LOGIC TEST	SR 3.3.2.3	SR 3.3.2.3	3.3-34	Y (stb)
Perform MASTER RELAY TEST	SR 3.3.2.4	SR 3.3.2.4	3.3-34	Y (stb)
Perform COT	SR 3.3.2.5	SR 3.3.2.5	3.3-34	Y
Perform SLAVE RELAY TEST	SR 3.3.2.6	SR 3.3.2.6	3.3-35	Y
Perform TADOT (92 days)	**SR 3.3.2.7**	**----------**	**na**	**na**
Perform TADOT (18 months)	**----------**	**SR 3.3.2.7**	**3.3-35**	**Y**
Perform TADOT	SR 3.3.2.8	SR 3.3.2.8	3.3-35	Y
Perform CHANNEL CALIBRATION	SR 3.3.2.9	SR 3.3.2.9	3.3-35	Y
Verify ESF RESPONSE TIMES are within limits	SR 3.3.2.10	SR 3.3.2.10	3.3-36	Y (stb)
Perform TADOT (Once per reactor trip breaker cycle)	**SR 3.3.2.11**	**----------**	**na**	**na**
Perform TADOT (18 months)	**----------**	**SR 3.3.2.11**	**3.3-36**	**Y**
Perform COT	**----------**	**SR 3.3.2.12**	**3.3-36**	**Y**
Perform SLAVE RELAY TEST	**----------**	**SR 3.3.2.13**	**3.3-37**	**Y (p)**
Perform SLAVE RELAY TEST	**----------**	**SR 3.3.2.14**	**3.3-37**	**Y (p)**
PAM Instrumentation				
Perform CHANNEL CHECK...	SR 3.3.3.1	SR 3.3.3.1	3.3-51	Y
Perform CHANNEL CALIBRATION	SR 3.3.3.2	SR 3.3.3.2	3.3-51	Y

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Remote Shutdown System				
Perform CHANNEL CHECK...	SR 3.3.4.1	SR 3.3.4.1	3.3-55	Y
Verify each required...switch is capable of performing...	SR 3.3.4.2	SR 3.3.4.2	3.3-55	Y
Perform CHANNEL CALIBRATION...	SR 3.3.4.3	SR 3.3.4.3	3.3-55	Y
[Perform TADOT of the reactor trip breaker open/closed indication.]	**SR 3.3.4.4**	**----------**	**na**	**na**

stb-Staggered Test Basis
p-Partial

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
LOP DG Start Instrumentation				
[Perform CHANNEL CHECK]	**SR 3.3.5.1**	**----------**	**na**	**na**
Tie breakers...shall be verified open	**----------**	**SR 3.3.5.1**	**3.3-58**	**Y**
Perform TADOT	SR 3.3.5.2	SR 3.3.5.2	3.3-58	Y
Perform CHANNEL CALIBRATION...	SR 3.3.5.3	SR 3.3.5.3	3.3-58	Y
Verify LOP DG Start ESF RESPONSE TIMES are within limits	**----------**	**SR 3.3.5.4**	**3.3-58**	**Y (stb)**
Containment Purge and Exhaust Isolation Instrumentation				
Perform CHANNEL CHECK	SR 3.3.6.1	SR 3.3.6.1	3.3-62	Y
Perform ACTUATION LOGIC TEST	SR 3.3.6.2	SR 3.3.6.2	3.3-62	Y (stb)
Perform MASTER RELAY TEST.	**SR 3.3.6.3**	**----------**	**na**	**na**
[Perform ACTUATION LOGIC TEST]	**SR 3.3.6.4**	**----------**	**na**	**na**
[Perform MASTER RELAY TEST]	**SR 3.3.6.5**	**----------**	**na**	**na**
Perform COT	SR 3.3.6.6	SR 3.3.6.3	3.3-62	Y
Perform SLAVE RELAY TEST	**SR 3.3.6.7**	**----------**	**na**	**na**
Perform TADOT	SR 3.3.6.8	SR 3.3.6.4	3.3-62	Y
Perform CHANNEL CALIBRATION	SR 3.3.6.9	SR 3.3.6.5	3.3-62	Y
Verify...ESF RESPONSE TIMES are within limits	**----------**	**SR 3.3.6.6**	**3.3-62**	**Y (stb)**
CREFS Actuation Instrumentation (CREVES)				
Perform CHANNEL CHECK	SR 3.3.7.1	SR 3.3.7.1	3.3-67	Y
Perform COT	SR 3.3.7.2	SR 3.3.7.2	3.3-67	Y
Perform ACTUATION LOGIC TEST	SR 3.3.7.3	SR 3.3.7.3	3.3-67	Y (stb)
Perform MASTER RELAY TEST	**SR 3.3.7.4**	**----------**	**na**	**na**
Perform ACTUATION LOGIC TEST	**SR 3.3.7.5**	**----------**	**na**	**na**
Perform MASTER RELAY TEST	**SR 3.3.7.6**	**----------**	**na**	**na**
Perform SLAVE RELAY TEST	**SR 3.3.7.7**	**----------**	**na**	**na**
Perform TADOT	SR 3.3.7.8	SR 3.3.7.4	3.3-67	Y
Perform CHANNEL CALIBRATION	SR 3.3.7.9	SR 3.3.7.5	3.3-67	Y
Verify...RESPONSE TIMES are within limits	**----------**	**SR 3.3.7.6**	**3.3-67**	**Y (stb)**
FBACS Actuation Instrumentation (Emergency Exhaust System (EES))				
Perform CHANNEL CHECK	SR 3.3.8.1	SR 3.3.8.1	3.3-72	Y
Perform COT	SR 3.3.8.2	SR 3.3.8.2	3.3-72	Y
Perform ACTUATION LOGIC TEST	SR 3.3.8.3	SR 3.3.8.3	3.3-72	Y (stb)
Perform TADOT	SR 3.3.8.4	SR 3.3.8.4	3.3-72	Y
Perform CHANNEL CALIBRATION	SR 3.3.8.5	SR 3.3.8.5	3.3-72	Y

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Boron Dilution Protection (Mitigation) System (BDMS)				
Perform CHANNEL CHECK	SR 3.3.9.1	SR 3.3.9.1	3.3-77	Y
Perform COT...	**SR 3.3.9.2**	**SR 3.3.9.3**	**3.3-77**	**Y**
Perform CHANNEL CALIBRATION	**SR 3.3.9.3**	**SR 3.3.9.4**	**3.3-77**	**Y**
Verify BGV0178 is secured in the closed position	**----------**	**SR 3.3.9.2**	**3.3-77**	**Y**
Verify...valves close...on...signal	**----------**	**SR 3.3.9.5**	**3.3-77**	**Y**
Verify one RCS loop is in operation	**----------**	**SR 3.3.9.6**	**3.3-77**	**Y**

stb- Staggered Test Basis

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
RCS Pressure, Temperature, and Flow DNB Limits				
Verify pressurizer pressure...	SR 3.4.1.1	SR 3.4.1.1	3.4-2	Y
Verify RCS average temperature...	SR 3.4.1.2	SR 3.4.1.2	3.4-2	Y
Verify RCS total flow rate...	SR 3.4.1.3	SR 3.4.1.3	3.4-2	Y
Verify by precision heat balance that RCS total flow...	SR 3.4.1.4	SR 3.4.1.4	3.4-2	Y (p)
RCS Minimum Temperature for Criticality				
Verify RCS Tavg in each loop...	SR 3.4.2.1	SR 3.4.2.1	3.4-3	Y
RCS P/T limits				
Verify...limits specified in the PTLR.	SR 3.4.3.1	SR 3.4.3.1	3.4-5	Y
RCS Loops - MODES 1 and 2				
Verify each RCS loop is in operation	SR 3.4.4.1	SR 3.4.4.1	3.4-6	Y
RCS Loops - MODE 3				
Verify required RCS loops are in operation	SR 3.4.5.1	SR 3.4.5.1	3.4-9	Y
Verify steam generator secondary side water levels...	SR 3.4.5.2	SR 3.4.5.2	3.4-9	Y
Verify correct breaker alignment...	SR 3.4.5.3	SR 3.4.5.3	3.4-9	Y
RCS Loops - MODE 4				
Verify one RHR or RCS loop is in operation	SR 3.4.6.1	SR 3.4.6.1	3.4-11	Y
Verify SG secondary side water levels are...	SR 3.4.6.2	SR 3.4.6.2	3.4-11	Y
Verify correct breaker alignment...	SR 3.4.6.3	SR 3.4.6.3	3.4-11	Y
RCS Loops - MODE 5, Loops Filled				
Verify one RHR loop is in operation	SR 3.4.7.1	SR 3.4.7.1	3.4-14	Y
Verify SG secondary side wide range water level...	SR 3.4.7.2	SR 3.4.7.2	3.4-14	Y
Verify correct breaker alignment...	SR 3.4.7.3	SR 3.4.7.3	3.4-14	Y
RCS Loops - MODE 5, Loops Not Filled				
Verify one RHR loop is in operation	SR 3.4.8.1	SR 3.4.8.1	3.4-16	Y
Verify correct breaker alignment...	SR 3.4.8.2	SR 3.4.8.2	3.4-16	Y
Pressurizer				
Verify pressurizer water level...	SR 3.4.9.1	SR 3.4.9.1	3.4-18	Y
Verify capacity of each required group...	SR 3.4.9.2	SR 3.4.9.2	3.4-18	Y
[Verify required pressurizer heaters are...]	**SR 3.4.9.3**	----------	**na**	**na**

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Pressurizer Safety Valves				
Verify each pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program.	**----------**	**SR 3.4.10.1**	**3.4-20**	**N (IST)**
Pressurizer PORVS				
Perform a complete cycle of each block valve	SR 3.4.11.1	SR 3.4.11.1	3.4-24	Y
Perform a complete cycle of each PORV (18 month)	**SR 3.4.11.2**	**----------**	**na**	**na**
Perform a complete cycle of each PORV (IST)	**----------**	**SR 3.4.11.2**	**3.4-24**	**N (IST)**
[Perform a complete cycle of each solenoid...]	**SR 3.4.11.3**	**----------**	**na**	**na**
[Verify PORVs and block valves are capable of...]	**SR 3.4.11.4**	**----------**	**na**	**na**
LTOP System				
Verify a maximum of zero safety injection pumps...	SR 3.4.12.1	SR 3.4.12.1	3.4-28	Y
Verify a maximum of one centrifugal charging pump...	SR 3.4.12.2	SR 3.4.12.2	3.4-28	Y
Verify each accumulator is isolated...	SR 3.4.12.3	SR 3.4.12.3	3.4-28	Y
Verify RHR suction isolation valves are open...	SR 3.4.12.4	SR 3.4.12.4	3.4-28	Y
Verify required RCS vent...	SR 3.4.12.5	SR 3.4.12.5	3.4-28	Y
Verify PORV block valve is open for each required PORV	SR 3.4.12.6	SR 3.4.12.6	3.4-29	Y
[Verify associated RHR suction isolation valve...]	**SR 3.4.12.7**	**Not Used**	**3.4-29**	**na**
Perform a COT on each required PORV...	SR 3.4.12.8	SR 3.4.12.8	3.4-29	Y
Perform CHANNEL CALIBRATION...	SR 3.4.12.9	SR 3.4.12.9	3.4-29	Y
RCS Operational LEAKAGE				
Verify RCS operational LEAKAGE is within limits...	SR 3.4.13.1	SR 3.4.13.1	3.4-31	Y
Verify primary to secondary LEAKAGE is...	SR 3.4.13.2	SR 3.4.13.2	3.4-31	Y
RCS PIV Leakage				
Verify leakage from each RCS PIV is equivalent to...	SR 3.4.14.1	SR 3.4.14.1	3.4-34	Y (p)
Verify RHR suction isolation valve interlock prevents...	SR 3.4.14.2	SR 3.4.14.2	3.4-35	Y
Verify RHR System autoclosure interlock...	**SR 3.4.14.3**	**----------**	**na**	**na**

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
RCS Leakage Detection Instrumentation				
Perform CHANNEL CHECK...	SR 3.4.15.1	SR 3.4.15.1	3.4-39	Y
Perform COT...	SR 3.4.15.2	SR 3.4.15.2	3.4-39	Y
Perform CHANNEL CALIBRATION...sump level...	SR 3.4.15.3	SR 3.4.15.3	3.4-39	Y
Perform CHANNEL CALIBRATION radioactivity...	SR 3.4.15.4	SR 3.4.15.4	3.4-39	Y
Perform CHANNEL CALIBRATION condensate flow...	SR 3.4.15.5	SR 3.4.15.5	3.4-39	Y
RCS Specific Activity				
Verify reactor coolant gross specific activity...	**SR 3.4.16.1**	----------	**na**	**na**
Verify reactor coolant DOSE EQUIVALENT XE-133...	----------	**SR 3.4.16.1**	**3.4-41**	**Y**
Verify reactor coolant DOSE EQUIVALENT I-131...	SR 3.4.16.2	SR 3.4.16.2	3.4-41	Y (p)
Determine Ē from a sample taken...	**SR 3.4.16.3**	----------	**na**	**na**
RCS Loop Isolation Valves (3.4.17)				
Verify each RCS loop isolation valve is open...	**SR 3.4.17.1**	----------	**na**	**na**
RCS Isolated Loop Startup (WOG STS 3.4.18)				
Verify cold leg temperature of isolated loop is...	**SR 3.4.18.1**	----------	**na**	**na**
Verify boron concentration of isolated loop is...	**SR 3.4.18.2**	----------	**na**	**na**
RCS Loops - Test Exceptions				
Verify THERMAL POWER is < P-7	**SR 3.4.19.1 thru 3**	----------	**na**	**na**
Steam Generator (SG) Tube Integrity (WOG STS)				
Verify SG tube integrity in accordance with the Steam Generator Program	----------	SR 3.4.17.1	3.4-44	N (SGP)
Verify that each inspected SG tube that satisfies the tube repair criteria is plugged in accordance...	----------	SR 3.4.17.2	3.4-44	N (ed)

p- Partial
IST-Inservice Test Program
SGP-Steam Generator Program
ed- Event Driven

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Four ECCS accumulators shall be OPERABLE				
Verify each accumulator isolation valve is fully open	SR 3.5.1.1	SR 3.5.1.1	3.5-2	Y
Verify borated water volume...	SR 3.5.1.2	SR 3.5.1.2	3.5-2	Y
Verify nitrogen cover pressure...	SR 3.5.1.3	SR 3.5.1.3	3.5-2	Y
Verify boron concentration...	SR 3.5.1.4	SR 3.5.1.4	3.5-2	Y (p)
Verify power is removed from	SR 3.5.1.5	SR 3.5.1.5	3.5-2	Y
ECCS - Operating				
Verify the following valves are in...	SR 3.5.2.1	SR 3.5.2.1	3.5-4	Y
Verify each ECCS manual, power operated, and automatic valve...	SR 3.5.2.2	SR 3.5.2.2	3.5-4	Y
Verify ECCS piping is full of water	SR 3.5.2.3	SR 3.5.2.3	3.5-4	Y
Verify each ECCS pump's developed head at...	SR 3.5.2.4	SR 3.5.2.4	3.5-4	N (IST)
Verify each ECCS automatic valve...	SR 3.5.2.5	SR 3.5.2.5	3.5-5	Y
Verify each ECCS pump starts automatically...	SR 3.5.2.6	SR 3.5.2.6	3.5-5	Y
Verify, for each ECCS throttle valve...	SR 3.5.2.7	SR 3.5.2.7	3.5-5	Y
Verify, by visual inspection, each ECCS train containment sump...	SR 3.5.2.8	SR 3.5.2.8	3.5-5	Y
ECCS - Shutdown	**----------**	**SR 3.5.3.1**	**3.5-7**	**Y (see 3.5.2 SRs)**
Refueling Water Storage Tank (RWST)				
Verify RWST borated water temperature...	SR 3.5.4.1	SR 3.5.4.1	3.5-9	Y
Verify RWST borated water volume...	SR 3.5.4.2	SR 3.5.4.2	3.5-9	Y
Verify RWST boron concentration....	SR 3.5.4.3	SR 3.5.4.3	3.5-9	Y
Seal Injection Flow				
Verify manual seal injection throttle valves are...	SR 3.5.5.1	SR 3.5.5.1	3.5-11	Y
Boron Injection Tank (BIT)	**SR 3.5.6.1 thru 3**	**----------**	**na**	**na**

p- Partial
IST-Inservice Test Program

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Containment shall be OPERABLE				
Perform required visual examinations and leakage rate testing...	----------	SR 3.6.1.1	3.6-2	N (CLRT)
Verify containment structural integrity...	----------	SR 3.6.1.2	3.6-2	N (Tend Sur)
Containment Air Locks				
Two containment air locks shall be OPERABLE	SR 3.6.2.1	SR 3.6.2.1	3.6-6	N (CLRT)
Verify only one door in the air lock can be opened at a time	SR 3.6.2.2	SR 3.6.2.2	3.6-6	Y
Containment Isolation Valves				
Verify each containment shutdown purge valve...	**SR 3.6.3.1**	**SR 3.6.3.1**	**3.6-13**	**Y (p)**
Verify each containment mini-purge valve...	SR 3.6.3.2	SR 3.6.3.2	3.6-13	Y
Verify each containment isolation manual valve...	SR 3.6.3.3	SR 3.6.3.3	3.6-13	Y
Verify each containment isolation manual valve...	SR 3.6.3.4	SR 3.6.3.4	3.6-14	N (ed)
Verify the isolation time of each...	SR 3.6.3.5	SR 3.6.3.5	3.6-14	N (IST)
[Cycle each weight or spring loaded check valve testable...]	**SR 3.6.3.6**	----------	**na**	**na**
Perform leakage rate testing for containment shutdown purge valves with resilient seals...	**SR 3.6.3.7**	**SR 3.6.3.6**	**3.6-14**	**Y (p)**
Perform leakage rate testing for containment mini-purge and shutdown purge valves with resilient seals.	----------	**SR 3.6.3.7**	**3.6-15**	**Y (p)**
Verify each automatic containment isolation valve that is not locked...	SR 3.6.3.8	SR 3.6.3.8	3.6-15	Y
[Cycle each weight or spring loaded check valve...]	**SR 3.6.3.9**	----------	**na**	**na**
[Verify each [ ] inch containment purge valve is blocked to restrict...]	**SR 3.6.3.10**	----------	**na**	**na**
Containment Pressure (3.6.4A) (Atmospheric)				
Verify containment pressure is within limits	SR 3.6.4A.1	SR 3.6.4.1	3.6-16	Y
Containment Air Temperature (3.6.5A) (Atmospheric)				
Verify containment average air temperature is within limit	SR 3.6.5A.1	SR 3.6.5.1	3.6-17	Y
Containment Spray and Cooling Systems (3.6.6B) (Atmospheric and Dual (Credit not taken for iodine removal by the Containment Spray System)				
Verify each containment spray manual...	SR 3.6.6B.1	SR 3.6.6.1	3.6-19	Y

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Operate each containment cooling train fan unit...	SR 3.6.6B.2	SR 3.6.6.2	3.6-19	Y
Verify each containment cooling train cooling water flow rate...	SR 3.6.6B.3	SR 3.6.6.3	3.6-20	Y
Verify each containment spray pump's developed head...	SR 3.6.6B.4	SR 3.6.6.4	3.6-20	N (IST)
Verify each automatic containment spray valve in the flow path that is not locked...	SR 3.6.6B.5	SR 3.6.6.5	3.6-20	Y
Verify each containment spray pump starts...	SR 3.6.6B.6	SR 3.6.6.6	3.6-20	Y
Verify each containment cooling train starts automatically and minimum...	SR 3.6.6B.7	SR 3.6.6.7	3.6-20	Y
Verify each spray nozzle is unobstructed	SR 3.6.6B.8	SR 3.6.6.8	3.6-20	Y
Spray Additive System (3.6.7)	**SR 3.6.7.1 thru 5**	**----------**	**na**	**na**
Recirculation Fluid pH Control (RFPC) System				
Verify the integrity of the RFPC System	**----------**	**SR 3.6.7.1**	**3.6-21**	**Y**
Verify the RFPC System ensures an equilibrium sump pH ≥ 7.1	**----------**	**SR 3.6.7.2**	**3.6-21**	**Y**
Shield Building (3.6.8) (Dual and Ice Condenser)	**SR 3.6.8.1 thru 4**	**----------**	**na**	**na**
Hydrogen Mixing System (HMS) (3.6.9)	**SR 3.6.9.1 thru 3**	**----------**	**na**	**na**
Hydrogen Ignition System (3.6.10)	**SR 3.6.10.1 thru 3**	**----------**	**na**	**na**
Iodine Cleanup System (3.6.11)	**SR 3.6.11.1 thru 4**	**----------**	**na**	**na**
Vacuum Relief Valves (3.6.12)	**----------**	**----------**	**na**	**na**
Shield Building Air Cleanup System (3.6.13)	**SR 3.6.13.1 thru 5**	**----------**	**na**	**na**
Air Return System (3.6.14)	**SR 3.6.14.1 thru 4**	**----------**	**na**	**na**
Ice Bed (3.6.15)	**SR 3.6.15.1 thru 6**	**----------**	**na**	**na**
Ice Condenser Doors (3.6.16)	**SR 3.6.16.1 thru 7**	**----------**	**na**	**na**
Divider Barrier Integrity (3.6.17)	**SR 3.6.17.1**	**----------**	**na**	**na**

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
	thru 5			
Containment Recirculation Drains (3.6.18)	SR3.6.18.1 and 2	----------	na	na

CLRT-Containment LRT
Tend Sur-Tendon Surveillance
p- Partial
IST-Inservice Test Program

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Main Steam Safety Valves (MSSVs)				
Verify each required MSSV lift setpoint per...	----------	SR 3.7.1.1	3.7-2	N (IST)
Main Steam Isolation Valves (MSIVs)				
Verify isolation time of each MSIV is within limits	SR 3.7.2.1	SR 3.7.2.1	3.7-8	N (IST)
Verify each MSIV actuates to the isolation position on...	SR 3.7.2.2	SR 3.7.2.2	3.7-8	Y
Verify isolation times of each...	----------	SR 3.7.2.3	3.7-8	N (IST)
Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulating...				
Verify the closure time of each MFRV and MFRVBV is within limits	SR 3.7.3.1	SR 3.7.3.1	3.7-11	N (IST)
Verify each MFIV, MFRV and MFRVBV actuates to...	SR 3.7.3.2	SR 3.7.3.2	3.7-11	Y
Verify the closure time of each MFIV is within limits	**----------**	**SR 3.7.3.3**	**3.7-11**	**N (IST)**
Atmospheric Steam Dump Valves (ASDs)				
Verify one complete cycle of each ASD	**SR 3.7.4.1**	**SR 3.7.4.1**	**3.7-12**	**N (IST)**
Verify one complete cycle of each ASD manual isolation valve	**SR 3.7.4.2**	**SR 3.7.4.2**	**3.7-12**	**N (IST)**
Auxiliary Feedwater (AFW) System				
Verify each AFW manual, power operated, and automatic valve...	SR 3.7.5.1	SR 3.7.5.1	3.7-17	Y
Verify the developed head of each AFW pump...	SR 3.7.5.2	SR 3.7.5.2	3.7-17	N (IST)
Verify each AFW automatic valve that is not locked...	SR 3.7.5.3	SR 3.7.5.3	3.7-17	Y
Verify each AFW pump starts automatically on...	SR 3.7.5.4	SR 3.7.5.4	3.7-18	Y
Verify proper alignment of the required AFW flow paths...	SR 3.7.5.5	SR 3.7.5.5	3.7-18	N (ed)
Condensate Storage Tank (CST)				
Verify the CST contained water volume is...	SR 3.7.6.1	SR 3.7.6.1	3.7-20	Y
Component Cooling Water (CCW) System				
Verify each CCW manual, power operated, and...	SR 3.7.7.1	SR 3.7.7.1	3.7-22	Y
Verify each CCW automatic valve in the flow path that is not locked...	SR 3.7.7.2	SR 3.7.7.2	3.7-22	Y

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Verify each CCW pump starts automatically on...	SR 3.7.7.3	SR 3.7.7.3	3.7-22	Y
Essential Service Water System (ESW)				
Verify each ESW manual, power operated, and...	SR 3.7.8.1	SR 3.7.8.1	3.7-25	Y
Verify each ESW automatic valve in the flow path...	SR 3.7.8.2	SR 3.7.8.2	3.7-25	Y
Verify each ESW pump starts automatically on...	SR 3.7.8.3	SR 3.7.8.3	3.7-25	Y
Ultimate Heat Sink (UHS)				
Verify water level of...	SR 3.7.9.1	SR 3.7.9.1	3.7-27	Y
Verify average water temperature of...	SR 3.7.9.2	SR 3.7.9.2	3.7-27	Y
Operate each cooling tower fan for...	SR 3.7.9.3	SR 3.7.9.3	3.7-27	Y
[Verify each cooling tower fan starts automatically on an actual or simulated actuation signal.]	**SR 3.7.9.4**	**----------**	**na**	**na**
Control Room Emergency Ventilation System (CREVS)				
Operate each CREVS train pressurization filter unit for...	SR 3.7.10.1	SR 3.7.10.1	3.7-31	Y
Perform required CREVS filter testing in accordance with the Ventilation...	SR 3.7.10.2	SR 3.7.10.2	3.7-31	N (VFTP)
Verify each CREVS train actuates on an actual or simulated actuation signal	SR 3.7.10.3	SR 3.7.10.3	3.7-31	Y
Verify one CREFS train can maintain a positive pressure...	**SR 3.7.10.4**	**----------**	**na**	**na**
Perform required unfiltered air inleakage testing of the CRE and CBE boundaries in accordance with the Control Room Envelope Habitability Program	**----------**	**SR 3.7.10.4**	**3.7-31**	**N (CREHP)**
Control Room Air Conditioning System (CRACS)				
Verify each CRACS train has the capability to...	SR 3.7.11.1	SR 3.7.11.1	3.7-34	Y
ECCS Pump Room Exhaust Air Cleanup System	**SR 3.7.12.1 thru 5**	**----------**	**na**	**na**
Emergency Exhaust System (EES)				
Operate each EES train for ≥ 10 continuous hours...	SR 3.7.13.1	SR 3.7.13.1	3.7-38	Y
Perform required EES filter testing in accordance with the Ventilation...	SR 3.7.13.2	SR 3.7.13.2	3.7-38	N (VFTP)
Verify each EES train actuates on...	SR 3.7.13.3	SR 3.7.13.3	3.7-38	Y

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Verify one EES train can maintain a negative pressure...SIS	SR 3.7.13.4	SR 3.7.13.4	3.7-38	Y (stb)
[Verify each FBACS filter bypass damper can be closed]	**SR 3.7.13.5**	**----------**	**na**	**na**
Verify one EES train can maintain a negative pressure...FBVIS	**----------**	**SR 3.7.13.5**	**3.7-38**	**Y (stb)**
Penetration Room Exhaust Air Cleanup System	**SR 3.7.14.1 thru 5**	**----------**	**3.7-37**	**na**
Fuel Storage Pool Water Level				
Verify the fuel storage pool water level is...	SR 3.7.15.1	SR 3.7.15.1	3.7-40	Y
Fuel Storage Pool Boron Concentration				
Verify the fuel storage pool boron concentration is within limit	SR 3.7.16.1	SR 3.7.16.1	3.7-40	Y
Spent Fuel Pool Storage				
Verify by administrative means the initial enrichment and burnup...	----------	SR 3.7.17.1	3.7-42	N (ed)
Secondary Specific Activity				
Verify the specific activity of the secondary coolant is...	SR 3.7.18.1	SR 3.7.18.1	3.7-45	Y

IST-Inservice Test Program
ed- Event Driven
VFTP-Ventilation Filter Test Prog
CREHP-CR Envelop Habitability Prog
stb-Staggered Test Basis

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
AC Sources - Operating				
Verify correct breaker alignment and indicated...	SR 3.8.1.1	SR 3.8.1.1	3.8-6	Y
Verify each DG starts from standby conditions...	SR 3.8.1.2	SR 3.8.1.2	3.8-6	Y
Verify each DG is synchronized and loaded and...	SR 3.8.1.3	SR 3.8.1.3	3.8-7	Y
Verify each day tank [and engine mounted tank] contains...	**SR 3.8.1.4**	**----------**	**na**	**na**
Verify each fuel oil transfer pump starts on low level...	**----------**	**SR 3.8.1.4**	**3.8-7**	**Y**
Check for and remove accumulated water from each day tank	SR 3.8.1.5	SR 3.8.1.5	3.8-7	Y
Verify the fuel oil transfer system operates to...	SR 3.8.1.6	SR 3.8.1.6	3.8-7	Y
Verify each DG starts from standby condition and achieves...	SR 3.8.1.7	SR 3.8.1.7	3.8-8	Y
Verify [automatic [and] manual] transfer of AC power sources from...	**SR 3.8.1.8**	**SR 3.8.1.8**	**3.8-8**	**Not Used**
Verify each DG rejects a load greater than or...	**SR 3.8.1.9**	**SR 3.8.1.9**	**3.8-8**	**Not Used**
Verify each DG operating at a power factor ≤ 0.9 and ≥ 0.8 does not trip and voltage is maintained...	SR 3.8.1.10	SR 3.8.1.10	3.8-8	Y
Verify on an actual or simulated loss of offsite power signal...	SR 3.8.1.11	SR 3.8.1.11	3.8-9	Y
Verify on an actual or simulated safety injection signal...	SR 3.8.1.12	SR 3.8.1.12	3.8-10	Y
Verify each DG's automatic trips are bypassed on...	SR 3.8.1.13	SR 3.8.1.13	3.8-11	Y
Verify each DG...operates for ≥ 24 hours...	SR 3.8.1.14	SR 3.8.1.14	3.8-12	Y
Verify each DG starts and achieves...	SR 3.8.1.15	SR 3.8.1.15	3.8-12	Y
Verify each DG: a. Synchronizes b. Transfers...	SR 3.8.1.16	SR 3.8.1.16	3.8-13	Y
Verify, with a DG operating in test mode and connected...	SR 3.8.1.17	SR 3.8.1.17	3.8-13	Y
Verify interval between each sequenced load block is...	SR 3.8.1.18	SR 3.8.1.18	3.8-14	Y
Verify on an actual or simulated loss of offsite power signal in conjunction...	SR 3.8.1.19	SR 3.8.1.19	3.8-14	Y
Verify when started simultaneously from standby condition, each DG achieves	SR 3.8.1.20	SR 3.8.1.20	3.8-15	Y
Perform ACTUATION LOGIC TEST for each train of the load shedder and emergency load sequencer	**----------**	**SR 3.8.1.21**	**3.8-15**	**Y (stb)**

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
AC Sources - Shutdown	**----------**	**SR 3.8.2.1**	**3.8-19**	**Y (see 3.8.1 SRs)**
Diesel Fuel Oil, Lube Oil, and Starting Air				
Verify each fuel oil storage tank contains...	SR 3.8.3.1	SR 3.8.3.1	3.8-22	Y
Verify lubricating oil inventory is...	SR 3.8.3.2	SR 3.8.3.2	3.8-22	Y
Verify fuel oil properties of new and stored fuel oil are...	SR 3.8.3.3	SR 3.8.3.3	3.8-22	N (DFOTP)
Verify pressure in two starting air receivers is...	SR 3.8.3.4	SR 3.8.3.4	3.8-22	Y
Check for and remove accumulated water from...	SR 3.8.3.5	SR 3.8.3.5	3.8-22	Y
Not Used	**----------**	**SR 3.8.3.6**	**3.8-22**	**Not Used**
DC Sources - Operating				
Verify battery terminal voltage is...	SR 3.8.4.1	SR 3.8.4.1	3.8-23	Y
Verify no visible corrosion at battery terminals and...	**----------**	**SR 3.8.4.2**	**3.8-24**	**Y**
Verify battery cells, cell plates, and racks show no...	**----------**	**SR 3.8.4.3**	**3.8-24**	**Y**
Remove visible terminal corrosion, verify battery cell	**----------**	**SR 3.8.4.4**	**3.8-24**	**Y**
Verify battery connection resistance is	**----------**	**SR 3.8.4.5**	**3.8-24**	**Y**
Verify each battery charger supplies...	SR 3.8.4.2	SR 3.8.4.6	3.8-24	Y
Verify battery capacity is adequate to supply...	SR 3.8.4.3	SR 3.8.4.7	3.8-25	Y
Verify battery capacity is ≥ 80% of the manufacturer's rating...	**SR 3.8.6.6**	**SR 3.8.4.8**	**3.8-25**	**Y (p)**

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
DC Sources - Shutdown	**----------**	**SR 3.8.5.1**	**3.8-27**	**Y (see 3.8.4 SRs)**
Battery Cell Parameters				
Verify each battery float current is...	**SR 3.8.6.1**	**----------**	**na**	**na**
Verify each battery pilot cell voltage is...	**SR 3.8.6.2**	**----------**	**na**	**na**
Verify each battery connected cell electrolyte level is...	**SR 3.8.6.3**	**----------**	**na**	**na**
Verify each battery pilot cell temperature is...	**SR 3.8.6.4**	**----------**	**na**	**na**
Verify each battery connected cell voltage is...	**SR 3.8.6.5**	**----------**	**na**	**na**
Verify battery capacity is...	**SR 3.8.6.6**	**See SR 3.8.4.8**	**----------**	**----------**
Verify battery cell parameters meet Table 3.8.6-1...	**----------**	**SR 3.8.6.1**	**3.8-29**	**Y**
Verify battery cell parameters meet Table 3.8.6-1...	**----------**	**SR 3.8.6.2**	**3.8-30**	**Y (p)**
Verify average electrolyte temperature of representative cells is...	**----------**	**SR 3.8.6.3**	**3.8-30**	**Y**
Inverters - Operating				
Verify correct inverter voltage, and alignment to required AC vital buses	SR 3.8.7.1	SR 3.8.7.1	3.8-33	Y
Inverters - Shutdown				
Verify correct inverter voltage, and alignments to required AC vital buses	SR 3.8.8.1	SR 3.8.8.1	3.8-35	Y
Distribution Systems - Operating				
Verify correct breaker alignments and voltage to required...	SR 3.8.9.1	SR 3.8.9.1	3.8-37	Y
Distribution Systems - Shutdown				
Verify correct breaker alignments and voltage to required...	SR 3.8.10.1	SR 3.8.10.1	3.8-39	Y

stb-Staggered Test Basis
DFOTP-Diesel Fuel Oil Test Program
p-Partial

Technical Specification Section Title/ Surveillance Description	TSTF-425	Callaway	Cal TS Page #	Applicability of 5b
Boron Concentration				
Verify boron concentration is within the limit	SR 3.9.1.1	SR 3.9.1.1	3.9-2	Y
Unborated Water Source Isolation Valves				
Verify each valve that isolates unborated water sources is secured...	SR 3.9.2.1	SR 3.9.2.1	3.9-4	Y
Nuclear Instrumentation				
Perform CHANNEL CHECK	SR 3.9.3.1	SR 3.9.3.1	3.9-6	Y
Perform CHANNEL CALIBRATION.	SR 3.9.3.2	SR 3.9.3.2	3.9-6	Y
Containment Penetrations				
Verify each required containment penetration is in the required status	SR 3.9.4.1	SR 3.9.4.1	3.9-8	Y
Verify the capability to install the equipment hatch	----------	**SR 3.9.4.2**	**3.9-8**	**Y**
Verify each required containment purge isolation valve actuates to the isolation position **on a manual actuation signal**	**SR 3.9.4.2**	**SR 3.9.4.3**	**3.9-8**	**Y**
Residual Heat Removal (RHR) and Coolant Circulation - High Water Level				
Verify one RHR loop is in operation and circulating reactor coolant at a flow...	SR 3.9.5.1	SR 3.9.5.1	3.9-10	Y
Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level				
Verify one RHR loop is in operation and circulating reactor coolant at a flow...	SR 3.9.6.1	SR 3.9.6.1	3.9-12	Y
Verify correct breaker alignment and indicated power available	SR 3.9.6.2	SR 3.9.6.2	3.9-12	Y
Refueling Cavity Water Level				
Verify refueling pool water level is ≥ 23 ft above...	SR 3.9.7.1	SR 3.9.7.1	3.9-13	Y
DESIGN FEATURES	----------	4.0	4.0-1	N
Programs and Manuals				
New Program Change Description: Surveillance Frequency Control Program	5.5.18	5.5.18	5.0-21	Y

ULNRC- 05725
Attachment 8

List of Commitments

LIST OF COMMITMENTS

The following table identifies those actions committed to by AmerenUE in this document. Any other statements in this document are provided for information purposes and are not considered commitments.

COMMITMENT	Due Date/Event	COMN
The existing Bases information describing the basis for the Surveillance Frequency will be relocated to the licensee-controlled Surveillance Frequency Control Program.	**10/27/2011***	**50133**
AmerenUE proposes ...an Independent Decision-making Panel of qualified individuals with appropriate experience for recommending the acceptability of proposed surveillance frequency changes, in lieu of the site Maintenance Rule Expert Panel. This panel will be comprised of individuals whose experience levels are equal to or exceed the requirements of those on the Maintenance Rule Expert Panel. The individuals who will make up this panel will be designated by the senior management team that provides process oversight. The designated individuals will have expertise in the areas of probabilistic risk assessment, operations, maintenance, engineering, quality assurance, operating experience, and licensing. At least three individuals will have a minimum of 5 years experience at Callaway Plant or similar nuclear plants, and at least one individual will have worked on the modeling and updating of the PRA for Callaway Plant or similar plants for a minimum of 3 years. This level of experience and expertise will ensure that recommendations are well-considered and safety-focused. When developing potential changes, the panel will be augmented by the Surveillance Test Coordinator and at least one subject matter expert on the structure, system or component being evaluated.	**10/27/2011***	**50134**
The Callaway Plant On-Site Review Committee (ORC) will review probabilistic and deterministic assessments to determine if a sufficient basis exists to support Surveillance Test Interval (STI) change proposals and to approve or disapprove proposed STI changes.	**10/27/2011***	**50135**

During the interim period, i.e., from approval of this license amendment request until the availability of PRA Update 5, each of the F/Os (Table 1 of Attachment 2) and F&Os (Table 2 of Attachment 2) to Capability Category II of the Standard will be considered for each STI under evaluation, and, when appropriate, sensitivity studies will be performed to address selected F/Os or F&Os.	**10/27/2011***	**50136**

* This date assumes NRC approval on 4/30/2011 and 180 days to implement the approved amendment. Surveillance intervals will not be extended until all programs and procedures have been completed.