Duke Energy®

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November 30, 2010

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

10 CFR 50.90

Subject: Duke Energy Carolinas, LLC (Duke Energy)
Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414

Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program

Reference: Letter from Duke Energy to NRC, same subject, dated March 31, 2010

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

On October 12, 2010, a Request for Additional Information (RAI) was electronically transmitted by the NRC concerning the subject amendment request. The purpose of this letter is to formally respond to this RAI. Attachment 1 to this letter comprises Catawba's RAI response. The format of Attachment 1 is to restate each RAI question, followed by Catawba's response.

In addition, Attachment 2 contains updated Technical Specification (TS) and Bases marked up pages related to five TS changes that were recently approved by the NRC. As communicated on page 3 of Attachment 1 of the subject (reference) License Amendment Request (LAR), there were seven LARs pending NRC review and approval that affect surveillances modified by this LAR. Five of the seven LARs have been approved by the NRC and implemented by Catawba, while two are still pending. As stated in the LAR, Catawba is now providing the updated TS and Bases pages. These changes do not represent deviations from TSTF-425 or the NRC's model safety evaluation.

Please replace the corresponding pages in your LAR files. The following table summarizes the affected TS and Bases.

A001
NRR

Table of Updated TS and Bases Marked Up Pages

Date of Duke Energy LAR	Date of NRC Approval	Affected SRs and SR Bases
09/02/08	06/28/10	This LAR modifies the SR 3.6.6.4 to be "not applicable". The SR description for SR 3.5.4.2 is modified. The Bases only for SRs 3.3.2.7, 3.3.2.9, and 3.6.6.3 are revised also.
10/02/08	06/28/10	This LAR modifies the SR description for SRs 3.6.13.1, 3.6.13.4, 3.6.13.5, and 3.6.13.6.
05/28/09	05/27/10	This LAR modifies the SR description of SRs 3.8.1.2, 3.8.1.7, 3.8.1.9, 3.8.1.11, 3.8.1.12, 3.8.1.15, 3.8.1.19, and 3.8.1.20.
07/01/09	08/02/10	The SR Bases for SRs 3.3.1.7 and 3.3.1.8 are modified. Also, the SR description for SR 3.3.1.11 is modified.
09/30/09	08/24/10	This LAR modifies the Frequency of SR 3.6.6.7 to be event-driven.
12/14/09	Not yet approved	SRs 3.8.4.3 and 3.8.4.6 are modified to add a reference to a new table.
12/15/09	Not yet approved	SR 3.4.16.1 description is modified by this LAR. Also, SR 3.4.16.3 is deleted.

The conclusions reached in the original determination that the LAR contains No Significant Hazards Considerations and the basis for the categorical exclusion from performing an Environmental/Impact Statement have not changed as a result of this request for additional information.

In accordance with 10 CFR 50.91, a copy of this letter and its attachments are being forwarded to the appropriate South Carolina state official.

There are no commitments being made as a result of this RAI response.

Inquiries regarding this material should be directed to L.J. Rudy at (803) 701-3084.

Sincerely,

James R. Morris

LJR/s

Attachments

xc: w/attachments

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OATH AND AFFIRMATION

James R. Morris affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

James R. Morris, Site Vice President

Subscribed and sworn to me: 11/30/10
Date

Notary Public

My commission expires: 1/31/2018
Date

BETTY W. ALDRIDGE
YORK COUNTY
NOTARY PUBLIC
MY COMMISSION EXPIRES 1/31/2018
STATE OF SOUTH CAROLINA

bxc: w/attachments

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R.D. Hart (CN01RC)
L.J. Rudy (CN01RC)
K.L. Ashe (MG01RC)
K.R. Alter (ON03RC)
C.J. Thomas (EC05P)
M.S. Kitlan, Jr. (EC08I)
NCMPA-1
NCEMC
PMPA
ELL (EC05O)
Catawba Master File CN-801.01 (CN04DM)
RGC Date File
NSRB Support Staff (EC05N)

ATTACHMENT 1

RESPONSE TO NRC RAI

REQUEST FOR ADDITIONAL INFORMATION RELATED TO AN AMENDMENT TO ADOPT TECHNICAL SPECIFICATIONS TASK FORCE TRAVELLER TSTF-425 TO RELOCATE SPECIFIC SURVEILLANCE FREQUENCIES TO A LICENSEE CONTROLLED PROGRAM

CATAWBA NUCLEAR STATION UNITS 1 AND 2

DOCKET NO. 50-413 AND 50-414

1. Table 2-1 of Attachment 2 identifies specific unresolved "gaps" of the Catawba Nuclear Station probabilistic risk assessment (PRA) internal events model to meeting the American Society of Mechanical Engineers PRA standard Capability Category II supporting requirements. In the column labeled "Importance to 5b Application", the licensee asserts, for some specific supporting requirements which are not met at Capability Category II, that:

   i) Certain gaps will be assessed on a case-by-case basis
   ii) The gap has no or minimal impact on surveillance test exceptions.

   Asserting that certain gaps are to be assessed on a case-by-case basis is inconsistent with Nuclear Energy Institute (NEI) 04-10, Revision 1, which specifically requires Capability Category II. Further, NEI 04-10, requires all gaps to Capability Category II to be assessed via sensitivity studies. This position was accepted by the staff in its safety evaluation of NEI 04-10 Revision 1. Therefore, notwithstanding the assertions in Table 2-1 regarding Capability Category I, each supporting requirement not meeting Capability Category II must be further evaluated by sensitivity studies when applying the internal events PRA model for this application.

   With regard to item ii above, the gaps cannot be dispositioned a priori, since this would also conflict with NEI 04-10 which did not identify any supporting requirements that were not required for this application. Again, such gaps must be evaluated by sensitivity studies for each surveillance frequency change.

   The licensee is therefore requested to confirm that their plant program for control of surveillance frequencies includes a requirement to assess all open gaps to Capability Category II of the standard via sensitivity studies for each application of the NEI 04-10 methodology, and does not rely upon any a priori assessment of the relevance of the supporting requirement.

Duke Energy Response:

All open gaps to Capability Category II of the standard will be addressed via sensitivity studies for each application of the NEI 04-10 methodology, and will not rely upon any *a*

priori **assessment of the relevance of the supporting requirement. The Duke Energy plant program for control of surveillances has been revised to clarify the requirement to assess all open gaps to Capability Category II of the standard via sensitivity studies for each application of the NEI 04-10 methodology, and does not rely upon any *a priori* assessment of the relevance of the supporting requirement.**

Table 2-1 has been revised to remove wording that indicated gaps will be assessed on a case-by-case basis or that gaps have no or minimal impact on the surveillance frequency change.

2. In Table 2-1, Attachment 2 of the submittal, gap #14 identifies twelve supporting requirement deficiencies to the model. The licensee dispositions this gap as documentation issues. The staff requires a detailed clarification for all supporting requirements that were assessed against Capability Category II technical requirements and characterized as model documentation issues.

Duke Energy Response:

Table 2-1, Attachment 2 of the submittal, has been revised to provide a detailed clarification for all supporting requirements that were assessed against Capability Category II technical requirements and characterized as model documentation issues.

3. The staff requests explanation for why SR 3.8.4.9 frequency is changed from 60 months to insert 2 (The surveillance frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program) instead of insert 1 (In accordance with the Surveillance Frequency Control Program).

Duke Energy Response:

This was an editorial error. The corrected page of the submittal is enclosed as part of Attachment 2.

TABLE 2-1
STATUS OF IDENTIFIED GAPS IN THE CATAWBA PRA
TO CAPABILITY CATEGORY II OF THE ASME PRA STANDARD THROUGH ADDENDA RA-Sc-2007

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #1	Accident sequence notebooks and system model notebooks should document the phenomenological conditions created by the accident sequence progression.	AS-B3	Open. Phenomenological effects are considered in the model, although these considerations are not always documented.	For each surveillance frequency change evaluation, any phenomenological conditions created by the accident sequence progression will be identified, included and documented in the analysis.
Gap #2	Revise the data calc. to discuss component boundaries definitions.	DA-A1a	Open. SSC and unavailability boundaries, SSC failure modes and success criteria are used consistently across analyses; however, these need to be formally documented.	Each surveillance frequency change evaluation will use definitions for SSC boundary, unavailability boundary, failure mode, and success criteria consistently across the systems and data analyses.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #3	Revise the data calc. to group standby and operating component data. Group components by service condition to the extent supported by the data.	DA-B1	Open. Partitioning the failure rates represents a refinement to the data analysis process. Previously, generic data sources often did not provide standby and operating failure rates. NUREG/CR-6928 does provide more of this data, and will be used going forward.	Each surveillance frequency change evaluation will include sensitivity studies to consider the impact of grouping data into operating vs. standby failure rates and by service condition.
Gap #4	Enhance the documentation to include a discussion of the specific checks performed on the Bayesian-updated data, as required by this SR.	DA-D4	Open. As part of the Bayesian update process, checks are performed to assure that the posterior distribution is reasonable given the prior distribution and plant experience. These checks need to be formally documented.	Each surveillance frequency change evaluation will verify that the Bayesian update process produces a reasonable posterior distribution. (See the example tests in DA-D4.)

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #5	Provide documentation of the comparison of the component boundaries assumed for the generic CCF estimates to those assumed in the PRA to ensure that these boundaries are consistent.	DA-D6	Open. Generic CCF probabilities are considered for applicability to the plant. CCF probabilities are consistent with plant experience and component boundaries, although the CCF documentation needs to be enhanced to discuss component boundaries.	Each surveillance frequency change evaluation will ensure that CCF probabilities are consistent with component boundaries and plant experience.
Gap #6	Enhance the HRA to consider the potential for calibration errors.	HR-A2	Open. Based on evaluations using the EPRI HRA calculator, calibration errors that result in failure of a single channel are expected to fall in the 10^{-3} range. Relative to post-initiator HEPs, equipment random failure rates and maintenance unavailability, calibration HEPs are not expected to contribute significantly to overall equipment unavailability.	Each surveillance frequency change evaluation will identify and consider the impact that equipment calibration errors could have on the results and conclusions.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #7	Identify maintenance and calibration activities that could simultaneously affect equipment in either different trains of a redundant system or diverse systems.	HR-A3	Open. Based on evaluations using the EPRI HRA calculator, calibration errors that result in failure of multiple channels are expected to fall in the 10^{-5} (or smaller) range. Relative to post-initiator HEPs, latent human error probabilities, equipment random failure rates and maintenance unavailability, calibration HEPs and misalignment of multiple trains of equipment are not expected to contribute significantly to overall equipment unavailability.	Each surveillance frequency change evaluation will identify any work practices that could simultaneously affect equipment in either different trains of a redundant system or diverse systems.
Gap #8	Develop mean values for pre-initiator HEPs.	HR-D6	Open. Pre-initiator HEPs are generally set to relatively high screening values, which bound the mean values. Even so, pre-initiator HEPs are not significant contributors to risk.	Each surveillance frequency change evaluation will use mean values for pre-initiator HEPs.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #9	Document in more detail the influence of performance shaping factors on execution human error probabilities.	HR-G3	Open. Performance shaping factors are accounted for in the development of human error probabilities, although detailed documentation is not always available for every HRA input.	Each surveillance frequency change evaluation will use HEP values that have been quantified with consideration of plant-specific and scenario-specific performance shaping factors.
Gap #10	Enhance HRA documentation of the time available to complete actions.	HR-G4	Open. T/H analyses, simulator runs and operator interviews are used in developing the time available to complete operator actions. The time at which the cue to take action is received is specified in the HEP quantification. However, the HRA documentation needs to be enhanced to provide a traceable path to all analysis inputs.	Each surveillance frequency change evaluation will use HEP events with time available inputs based on plant-specific thermal/hydraulic analyses or simulations.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #11	Document a review of the HFEs and their final HEPs relative to each other to confirm their reasonableness given the scenario context, plant history, procedures, operational practices, and experience.	HR-G6	Open. HFEs are reviewed by knowledgeable site personnel to assure high quality. However, this review needs to be better documented.	For each surveillance frequency change evaluation, post-initiator HEPs will be reviewed against each other to check their reasonableness given the scenario context, plant procedures, operating practices and experience.
Gap #12	Develop mean values for post-initiator HEPs.	HR-G9	Open. The use of mean values for HEPs instead of lower probability median values can affect the PRA results.	Each surveillance frequency change evaluation will use mean values for post-initiator HEPs.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #13	Develop more detailed documentation of operator cues, relevant performance shaping factors, and availability of sufficient manpower to perform the action.	HR-H2	Open. Operator recovery actions are credited only if they are feasible, as determined by the procedural guidance, cues, performance shaping factors and available manpower. As noted for HR-G3, -G4, and -G6 above, the documentation of these considerations needs to be enhanced.	Each surveillance frequency change evaluation will credit operator actions only if they are feasible, as determined by the procedural guidance, cues, performance shaping factors and available manpower.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #14	Document: • a structured, systematic identification of initiating events • a review of generic analyses of similar plants • the systematic evaluation of the potential for failure of each system, including support systems, to result in an initiating event • the inclusion of initiators resulting from common cause equipment failures and from routine system alignments • the disposition of events that have occurred at conditions other than at-power operation for their potential to result in an initiator while at power • plant personnel input in determining whether potential initiating events have been overlooked • a review of plant-specific precursor events for their potential to result in initiating events • a structured, systematic initiating events grouping process that facilitates accident sequence definition and quantification • that initiators are grouped by similarity of plant response, success criteria, timing, and effect on operators and relevant systems; or events can be subsumed within a bounding group • the initiating events analysis assumptions and sources of uncertainty	IE-A1 IE-A3a IE-A4 IE-A4a IE-A5 IE-A6 IE-A7 IE-B1 IE-B2 IE-B3 IE-D3	Open. No technical issues are identified, just a need to enhance the documentation. The list of Catawba PRA initiating events is consistent with that of its sister plant, McGuire Nuclear Station, as well as with those found in analyses for similar plants, such as those contained in the Pressurized Water Reactor Owner's Group PSA Model and Results Comparison Database. The Catawba initiating events analysis is revised with each PRA update to ensure that it remains consistent with industry operating experience as well as current plant design, operation and experience. In addition, calculation CNC-1535.00-00-0114, *Potential Internal Initiating Events for the Catawba PRA*, has been performed to address the IE supporting requirements. However, this analysis needs to be incorporated into the base case PRA model.	Each surveillance frequency change evaluation will review CNC-1535.00-00-0114 for potential impacts on the analysis. Each surveillance frequency change evaluation will include sensitivity analyses to determine the impact of the assumptions and sources of model uncertainty on the 5b analysis results.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #15	Various enhancements to the internal flood analysis: • Identify the release characteristic and capacity associated with each flood source. • Discuss flood mitigative features. • Address the potential for spray, jet impingement, and pipe whip failures. • Provide more analysis of flood propagation flowpaths. Address potential structural failure of doors or walls due to flooding loads and the potential for barrier unavailability. • Address potential indirect effects. • Enhance the documentation to address all of the SR details.	IF-B3 IF-C2c IF-C3 IF-C3b IF-E6b IF-F2	Open. An update of the flood analysis to meet the Standard's requirements is planned for 2011. For McGuire – Catawba's sister plant – the internal flooding analysis has already been upgraded to meet the Standard's requirements.	A plan and schedule are in place for addressing internal flood issues related to the PRA Standard for CNS. In the interim, for each surveillance frequency change, we will evaluate all SRs not meeting CCII with sensitivity studies and refer to the updated MNS flood analyses for insights.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #16	Explicitly model RCS depressurization for small LOCAs and perform the dependency analysis on the HEPs.	LE-C6	Open. This issue affects certain small LOCAs. However, since the small LOCA contribution to LERF is small, there is no significant impact on the PRA results.	Each surveillance frequency change evaluation will include a sensitivity study to assess the importance of explicitly modeling RCS depressurization for small LOCAs.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #17	Various enhancements to the LERF documentation.	LE-G3 LE-G5 LE-G6	Open.	Each surveillance frequency change evaluation will document: • the relative contribution of contributors to LERF and any limitations in the LERF analysis that would impact the 5b evaluation • the use of the quantitative definition for significant accident progression sequence provided in the "Acronyms and Definitions" section of the PRA Standard.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #18	Perform and document a comparison of PRA results with similar plants and identify causes for significant differences. Identify the contributors to LERF and characterize the LERF uncertainties consistent with the applicable ASME Standard requirements.	LE-F3 QU-D3	Open. Since Catawba and McGuire are sister plants, in practice, their results are often compared. Also, comparisons performed for the Mitigating Systems Performance Index and other programs help identify causes for significant differences. However, to fully meet this SR, the model quantification documentation needs to be enhanced to provide a results comparison.	Each surveillance frequency change evaluation will perform and document a comparison of CDF and LERF results with those of similar plants.
Gap #19	Perform and document sensitivity analyses to determine the impact of the assumptions and sources of model uncertainty on the results.	LE-F2 LE-G4 QU-E4	Open. This is addressed with each Surveillance Test Interval assessment.	Each surveillance frequency change evaluation will include sensitivity analyses to determine the impact of the assumptions and sources of model uncertainty on the 5b analysis results.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #20	Expand the documentation of the PRA model results to address all required items.	QU-F2 QU-F6	Open. These SRs pertain to the model quantification documentation.	Each surveillance frequency change evaluation will document: • the model integration process, recovery analysis, and uncertainty and sensitivity analyses • the use of definitions for *significant basic event*, *significant cutset*, and *significant accident sequence* provided in the "Acronyms and Definitions" section of the PRA Standard.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #21	Improve the documentation on the T/H bases for all safety function success criteria for all initiators.	SC-A4	Open. Success criteria are developed to address all of the modeled initiating events. However, the documentation of success criteria needs to be improved to include initiator information.	Each surveillance frequency change evaluation will ensure that the success criteria address all initiators.
Gap #22	Provide evidence that an acceptability review of the T/H analyses is performed.	SC-B5	Open. Catawba success criteria are consistent with those of sister plants included in the PWROG PSA database. However, to fully meet this SR, the success criteria documentation needs to be enhanced to include a results comparison.	Each surveillance frequency change evaluation will check and ensure the reasonableness and acceptability of the T/H analyses results used to support the success criteria.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #23	Expand the documentation of the success criteria development to address all required items.	SC-C1 SC-C2	Open. These SRs pertain to the success criteria documentation.	Each surveillance frequency change evaluation will ensure that: • success criteria are documented in a manner that facilitates the 5b application, model upgrades and peer review • the processes used to develop overall PRA success criteria and supporting engineering bases, including inputs, methods and results are documented.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #24	Enhance the system documentation to include an up-to-date system walkdown checklist and system engineer review for each system.	SY-A4	Open. To support system model development, walkdowns and plant personnel interviews were performed. However, documentation of an up-to-date system walkdown is not included with each system notebook.	Workplace procedure XSAA-115, *PRA Modeling Guidelines*, has been revised to require documentation of a system walkdown and system engineer interview. A plan and schedule for updating the system models with the revised guidance is in place. Until each system notebook is updated, the impact of this gap will be evaluated for each surveillance frequency change.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #25	Enhance the systems analysis documentation to discuss component boundaries.	SY-A8	Open. Basic event component boundaries utilized in the systems analysis are consistent with those in the data analysis. In addition, component boundaries are consistent with those defined in the generic failure rate source documents, such as NUREG/CR-6928. Dependencies among components, such as interlocks, are explicitly modeled, consistent with the PRA Modeling Guidelines workplace procedure. There is no evidence of a technical problem with component boundaries, just a need to improve the documentation.	Each surveillance frequency change evaluation will use definitions for SSC boundary, unavailability boundary, failure mode, and success criteria consistently across the systems and data analyses.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #26	Provide quantitative evaluations for screening.	SY-A14	Open. There is no evidence of a technical problem associated with the screening of components or component failure modes, just a need to document a quantitative screening. It is expected that conversion to a more quantitative approach would not change decisions about whether or not to exclude components or failure modes. A review of our qualitative screening process confirms this expectation. For example, transfer failure events for motor-operated valves (MOVs) with 24 hr exposure times may not be modeled unless probabilistically significant with respect to logically equivalent basic events. For Catawba, the MOV transfers failure probability is less than 1% of the MOV fails to open on demand failure rate. In cases like this, not including the relatively low probability failure mode in the PRA model does not have an appreciable impact on the results.	For each surveillance frequency change, the component and failure mode screening performed in the systems analysis will be verified to meet the quantitative requirements provided in SY-A14.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #27	Per Duke's PRA modeling guidelines, ensure that a walkdown/system engineer interview checklist is included in each system notebook. Based on the results of the system walkdown, summarize in the system write-up any possible spatial dependencies or environmental hazards that may impact multiple systems or redundant components in the same system.	SY-B8	Open. As noted for SY-A4, walkdowns (which look for spatial and environmental hazards) have been performed, although up-to-date walkdown documentation is not included with each system notebook.	The impact of this gap will be evaluated for each surveillance frequency change. See Gap #24.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #28	Document a consideration of potential SSC failures due to adverse environmental conditions.	SY-B15	Open. The impact of adverse environmental conditions on SSC reliability is considered but is not always documented. However, there is no evidence of a technical problem associated with components that may be required to operate in conditions beyond their environmental qualification, just a need to improve the documentation.	For each surveillance frequency change, potential SSC failure due to adverse environmental conditions will be identified, included and documented in the analysis.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #29	Enhance system model documentation to comply with all ASME PRA Standard requirements.	SY-C2	Open. This SR pertains to the systems analysis documentation.	Workplace procedure XSAA-115, *PRA Modeling Guidelines*, has been revised to provide guidance on meeting the Standard's supporting requirements. A plan and schedule for updating the system models with the revised guidance is in place. Until each system notebook is updated, the impact of this gap will be evaluated for each surveillance frequency change.

ATTACHMENT 2

REPLACEMENT TS AND BASES PAGES

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	92 days INSERT 1
SR 3.3.1.10	----------NOTE---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	18 months INSERT 1
SR 3.3.1.11	----------NOTE---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Power Range Neutron Flux high voltage detector saturation curve verification is not required to be performed prior to entry into MODE 1 or 2. 3. Intermediate Range Neutron Flux detector plateau voltage verification is not required to be performed prior to entry into MODE 1 or 2.* ---------- Perform CHANNEL CALIBRATION.	18 months INSERT 1
SR 3.3.1.12	Perform CHANNEL CALIBRATION.	18 months INSERT 1
SR 3.3.1.13	Perform COT.	18 months INSERT 1

(continued)

* This Note applies to the Westinghouse-supplied compensated ion chamber neutron detectors. The compensated ion chamber neutron detectors are being replaced with Thermo Scientific-supplied fission chamber neutron detectors which do not require detector plateau voltage verification. Therefore, this Note does not apply to the fission chamber neutron detectors.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	Verify RWST borated water temperature is ≥ 70°F and ≤ 100°F.	~~24 hours~~ INSERT 1
SR 3.5.4.2	Verify RWST borated water volume is ≥ 363,513 gallons.*	~~7 days~~ INSERT 1
SR 3.5.4.3	Verify RWST boron concentration is within the limits specified in the COLR.	~~7 days~~ INSERT 1

* Following implementation of the modifications associated with ECCS Water Management on the respective unit, the RWST borated water volume for this SR shall be ≥ 377,537 gallons.

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray System

LCO 3.6.6 Two containment spray trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	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

(continued)

* Following implementation of the modifications associated with ECCS Water Management on the respective unit, there will be no automatic valves in the Containment Spray System.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.2	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 3.6.6.3	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 3.6.6.4	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.*	~~18 months~~ INSERT 1
SR 3.6.6.5	Verify that each spray pump is de-energized and prevented from starting upon receipt of a terminate signal and is allowed to manually** start upon receipt of a start permissive from the Containment Pressure Control System (CPCS).	~~18 months~~ INSERT 1
SR 3.6.6.6	Verify that each spray pump discharge valve closes or is prevented from opening upon receipt of a terminate signal and is allowed to manually** open upon receipt of a start permissive from the Containment Pressure Control System (CPCS).	~~18 months~~ INSERT 1
SR 3.6.6.7	Verify each spray nozzle is unobstructed.	Following activities which could result in nozzle blockage

* Following implementation of the modifications associated with ECCS Water Management on the respective unit, the requirements of SR 3.6.6.3 and SR 3.6.6.4 shall no longer be applicable.

** Following implementation of the modifications associated with ECCS Water Management on the respective unit, spray pump starting and spray pump discharge valve opening are manual functions.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1 Restore ice condenser door to OPERABLE status and closed positions.	48 hours
D. Required Action and associated Completion Time of Condition A or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.13.1 Verify all lower inlet doors indicate closed by the Inlet Door Position Monitoring System.	~~12 hours~~ INSERT 1
SR 3.6.13.2 Verify, by visual inspection, each intermediate deck door is closed and not impaired by ice, frost, or debris.	~~7 days~~ INSERT 1
SR 3.6.13.3 Verify, by visual inspection, each top deck door: a. Is in place; and b. Has no condensation, frost, or ice formed on the door that would restrict its opening.	~~92 days~~ INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.13.4	Verify, by visual inspection, each lower inlet door is not impaired by ice, frost, or debris.	18 months INSERT 1
SR 3.6.13.5	Verify torque required to cause each lower inlet door to begin to open is ≤ 675 in-lb and verify free movement of the door.	18 months INSERT 1
SR 3.6.13.6	Deleted.	
SR 3.6.13.7	Verify for each intermediate deck door: a. No visual evidence of structural deterioration; b. Free movement of the vent assemblies; and c. Free movement of the door.	18 months INSERT 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	7 days INSERT 1
SR 3.8.1.2	----------NOTES---------- 1. 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 ≥ 3950 V and ≤ 4580 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	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 ≤ 11 seconds voltage of ≥ 3950 V and frequency of ≥ 57 Hz and maintains steady-state voltage ≥ 3950 V and ≤ 4580 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	184 days INSERT 1
SR 3.8.1.8	Verify automatic and manual transfer of AC power sources from the normal offsite circuit to each alternate offsite circuit.	18 months INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTE---------- If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. ----------	
	Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 63 Hz; b. Within 3 seconds following load rejection, the voltage is ≥ 3950 V and ≤ 4580 V; and c. Within 3 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months INSERT 1
SR 3.8.1.10	Verify each DG does not trip and generator speed is maintained ≤ 500 rpm during and following a load rejection of ≥ 5600 kW and ≤ 5750 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 be performed in MODE 1, 2, 3, or 4. ----------	
	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 the emergency bus in ≤ 11 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage ≥ 3950 V and ≤ 4580 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies auto-connected shutdown loads for ≥ 5 minutes.	18 months INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTE---------- All DG starts may be preceded by prelube period. ----------	
	Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and:	18 months INSERT 1
	a. In ≤ 11 seconds after auto-start and during tests, achieves voltage ≥ 3950 V and ≤ 4580 V;	
	b. In ≤ 11 seconds after auto-start and during tests, achieves frequency ≥ 58.8 Hz and ≤ 61.2 Hz;	
	c. Operates for ≥ 5 minutes; and	
	d. The emergency bus remains energized from the offsite power system.	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 1 hour loaded ≥ 5600 kW and ≤ 5750 kW or until operating temperature is stabilized. 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 ≤ 11 seconds, voltage ≥ 3950 V, and frequency ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months INSERT 1
SR 3.8.1.16	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ---------- 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 standby operation.	18 months INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes the emergency bus in ≤ 11 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ 3950 V and ≤ 4580 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies auto-connected emergency loads for ≥ 5 minutes.	18 months INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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 ≤ 11 seconds, voltage of ≥ 3950 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ 4580 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	10 years INSERT 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.9	----------NOTE---------- This Surveillance shall not be performed for the DG batteries in MODE 1, 2, 3, or 4. ----------	
	Verify DC channel and DG battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	~~60 months~~ INSERT 1 AND 18 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND --------NOTE-------- Not applicable to DG batteries ---------- 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

BASES

ACTIONS (continued)

U.1

With two RTS trains inoperable, no automatic capability is available to shut down the reactor, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

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

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

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

Performing the Neutron Flux Instrumentation surveillances meets the License Renewal Commitments for License Renewal Program for High-Range Radiation and Neutron Flux Instrumentation Circuits per UFSAR Chapter 18, Table 18-1 and License Renewal Commitments specification CNS-1274.00-00-0016.

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 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. OF 12 HOURS FOR SFCP ADDITION ONLY

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.

INSERT 2

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the NIS channel output every 24 hours. If the calorimetric exceeds the NIS channel output by > 2% RTP, the NIS is not declared inoperable, but must be adjusted. If the NIS channel output cannot be properly adjusted, the channel is declared inoperable.

Two Notes modify SR 3.3.1.2. The first Note indicates that the NIS channel output shall be adjusted consistent with the calorimetric results if the absolute difference between the NIS channel output and the calorimetric is > 2% RTP. The second Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 12 hours is allowed for completing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are inaccurate.

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 the change in the absolute difference between NIS and heat balance calculated powers rarely exceeds 2% in any 24 hour period. Maintaining the 2% agreement is only applicable during equilibrium conditions.

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

INSERT 2

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output every 31 EFPD. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

Two Notes modify SR 3.3.1.3. Note 1 indicates that the excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%. Note 2 clarifies that the Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours is allowed for completing the first Surveillance after reaching 15% RTP.

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.

INSERT 2

SR 3.3.1.4

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

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

The Frequency of every 62 days on a STAGGERED TEST BASIS is justified in Reference 12.

FOR SFCP ADDITION ONLY

WCAP-15376-P-A, Rev. 1, MARCH 2003

INSERT 2

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 bypass

BASES

SURVEILLANCE REQUIREMENTS (continued)

condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 12.

WCAP-15376-P-A, REV. 1, MARCH 2003

INSERT 2

FOR SFCP ADDITION ONLY

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 detector measurements. 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 and overpower ΔT Function.

At Beginning of Cycle (BOC), the excore channels are compared to the incore detector measurements prior to exceeding 75% power. Excore detectors are adjusted as necessary. This low power surveillance satisfies the initial performance of SR 3.3.1.6 with subsequent surveillances conducted at least every 92 EFPD.

At BOC, after reaching full power steady state conditions, additional incore and excore measurements are taken at various ΔI conditions to determine the M_j factors. The M_j factors are normally only determined at BOC, but they may be changed at other points in the fuel cycle if the relationship between excore and incore measurements changes significantly.

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 24 hours is allowed for completing the first surveillance after reaching 75% RTP.

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

INSERT 2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

perform the intended Function.

The tested portion of the loop must trip within the Allowable Values specified in Table 3.3.1-1.

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

SR 3.3.1.7 is modified by a Note that provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be completed within 4 hours after entry into MODE 3.

INSERT 2

The Frequency of 184 days is justified in Reference 12.

WCAP-15376-P-A, Rev. 1, MARCH 2003 FOR SFCP ADDITION ONLY

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" (Reference 13) has been implemented, this SR is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the NOMINAL TRIP SETPOINT (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the channel shall be declared inoperable. The second Note also requires that the methodologies for calculating the as-left and the as-found

BASES

SURVEILLANCE REQUIREMENTS (continued)

tolerances be in the UFSAR. The NOMINAL TRIP SETPOINT definition includes a provision that would allow the as-left setting for the channel to be outside the tolerance band, provided the setting is conservative with respect to the NTSP. This provision is not applicable to Functions for which the second Note applies.

SR 3.3.1.8

[the Frequency specified in the Surveillance Frequency Control Program or

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6, during the Intermediate Range COT, and P-10, during the Power Range COT, interlocks are in their required state for the existing unit condition. The verification is performed by visual observation of the permissive status light in the unit control room. 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 and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "4 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 and four hours after reducing power below P-10 or 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 4 hour limit. Four hours is a reasonable time 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 periods > 4 hours. The Frequency of 184 days is justified in Reference 12.

INSERT 2

WCAP-15376-P-A, REV. 1, MARCH 2003
FOR SFCP ADDITION ONLY

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" (Reference 13) has been implemented, this SR is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the NOMINAL TRIP SETPOINT (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the channel shall be declared inoperable. The second Note also requires that the methodologies for calculating the as-left and the as-found tolerances be in the UFSAR. The NOMINAL TRIP SETPOINT definition includes a provision that would allow the as-left setting for the channel to be outside the tolerance band, provided the setting is conservative with respect to the NTSP. This provision is not applicable to Functions for which the second Note applies.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7. INSERT 2

WCAP-10271-P-A, SUPPLEMENT 2, REV. 1, JUNE 1990

FOR SFCP ADDITION ONLY

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

SR 3.3.1.10

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.

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

INSERT 2

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. The applicable time constants are shown in Table 3.3.1-1.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every 18 months. Three Notes modify this SR. Note 1 states that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the power range neutron detectors consists of a normalization of the detectors based on a power calorimetric and flux map performed above 15% RTP. The high voltage detector saturation curve is evaluated and compared to the manufacturer's data. The Westinghouse-supplied boron triflouride (BF_3) source range neutron detectors and compensated ion chamber intermediate range neutron detectors are being replaced with Thermo Scientific-supplied fission chamber source and intermediate range neutron detectors. The CHANNEL CALIBRATION for the BF_3 source range and compensated ion chamber intermediate range neutron detectors consists of obtaining the high voltage detector plateau and discriminator curves for source range, and the high voltage detector plateau for intermediate range, evaluating those curves, and comparing the curves to the manufacturer's data. The CHANNEL CALIBRATION for the fission chamber source and intermediate range neutron detectors consists of verifying that the channels respond correctly to test inputs with the necessary range and accuracy. Note 2 states that this Surveillance is not required for the NIS power range detectors for entry into MODE 2 or 1. Note 3 applies to the compensated ion chamber intermediate range neutron detectors, and states that this Surveillance is not required to be performed for entry into MODE 2 or 1. Notes 2 and 3 are required because the unit must be in at least MODE 2 to perform the test for the compensated ion chamber intermediate range detectors and MODE 1 for the power range detectors. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" (Reference 13) has been implemented, this SR is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the NOMINAL TRIP SETPOINT (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the channel shall be declared inoperable. The second Note also requires that the methodologies for calculating the as-left and the as-found tolerances be in the UFSAR. The NOMINAL TRIP SETPOINT definition includes a provision that would allow the as-left setting for the channel to be outside the tolerance band, provided the setting is conservative with respect to the NTSP. This provision is not applicable to Functions for which the second Note applies.

SR 3.3.1.12

SR 3.3.1.12 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every 18 months.

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

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks every 18 months. OF 18 MONTHS FOR SFCP ADDITION ONLY

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.

INSERT 2

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip and the SI Input from ESFAS. This TADOT is performed every 18 months. The test shall independently verify the OPERABILITY of the undervoltage and shunt trip mechanisms for the Manual Reactor Trip Function for the Reactor Trip Breakers and Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip.

OF 18 MONTHS FOR SFCP ADDITION ONLY

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.

INSERT 2

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. This TADOT is as described in SR 3.3.1.4, except that this test is performed prior to reactor startup. A Note states that 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 taking the reactor critical.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.16 and SR 3.3.1.17

SR 3.3.1.16 and SR 3.3.1.17 verify that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in the UFSAR (Ref. 1). Individual component response times are not modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the equipment reaches the required functional state (i.e., control and shutdown rods fully inserted in the reactor core).

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

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. In addition, while not specifically identified in the WCAP, ITT Barton 386A and 580A-0 sensors were compared to sensors which were identified. It was concluded that the WCAP results could be applied to these two sensor types as well. Response time verification for other sensor types must be demonstrated by test.

BASES

SURVEILLANCE REQUIREMENTS (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 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 the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

~~As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS. Testing of the final actuation devices is included in the testing. Testing of the RTS RTDs is performed on an 18 month frequency. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

INSERT 2

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. The response time of the neutron flux signal portion of the channel shall be measured from detector output or input of the first electronic component in the channel.

REFERENCES

1. UFSAR, Chapter 7.

2. UFSAR, Chapter 6.

3. UFSAR, Chapter 15.

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

REFERENCES (continued)

7. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

8. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" Sep., 1995.

9. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" Oct., 1998.

10. 10 CFR 50.67.

11. WCAP-14333-P-A, Rev. 1, October 1998.

12. WCAP-15376-P-A, Rev. 1, March 2003.

13. Technical Specification Task Force, Improved Standard Technical Specifications Change Traveler, TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" Revision 4.

BASES

SURVEILLANCE REQUIREMENTS

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

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

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

SR 3.3.2.1

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

Agreement criteria are 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.

OF 12 HOURS

FOR STCP ADDITION ONLY

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.

INSERT 2

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested every 92 days on a STAGGERED TEST BASIS, using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the

SURVEILLANCE REQUIREMENTS (continued)

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 14.

WCAP-15376-P-A, REVISION 1, MARCH 2003

FOR SFCP ADDITION ONLY

INSERT 2

SR 3.3.2.3

SR 3.3.2.3 is the performance of a TADOT every 31 days. This test is a check of the Loss of Offsite Power Function. Each Function is tested up to, and including, the master transfer relay coils.

This test also includes trip devices that provide actuation signals directly to the SSPS. The SR is modified by a Note that excludes final actuation of pumps and valves to minimize plant upsets that would occur. The Frequency is adequate based on operating experience, considering instrument reliability and operating history data.

31 DAY

FOR SFCP ADDITION ONLY

INSERT 2

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The time allowed for the testing (4 hours) is justified in Reference 7. The Frequency of 92 days is justified in Reference 14.

INSERT 2

ON A STAGGERED TEST BASIS

WCAP-15376-P-A, REVISION 1, MARCH 2003

FOR SFCP ADDITION ONLY

SR 3.3.2.5

SR 3.3.2.5 is the performance of a COT.

FOR SFCP ADDITION ONLY

A COT is performed on each required channel to ensure the channel will perform the intended Function. The tested portion of the loop must trip within the Allowable Values specified in Table 3.3.2-1.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

The Frequency of 184 days is justified in Reference 14. INSERT 2

WCAP-15376-P-A, REVISION 1, MARCH 2003

FOR SFCP ADDITION ONLY

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 Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data. INSERT 2

OF 92 DAYS

FOR SFCP ADDITION ONLY

: 1) WCAP-13900, "Extension of Slave Relay Surveillance Test Intervals," April 1994; 2) WCAP-13877 Revision 2-P-A, "Reliability Assessment of Westinghouse Type AR Relays Used As SSPS Slave Relays," August 2000; 3) WCAP-13878-P-A Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," August 2000.

For SFCP addition only

For slave relays or any auxiliary relays in the ESFAS circuit that are of the type Westinghouse AR or Potter & Brumfield MDR, the SLAVE RELAY TEST frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

For slave relays or any auxiliary relays in the ESFAS circuit that are of the type Westinghouse AR or Potter & Brumfield MDR, the SLAVE RELAY TEST is performed every 18 months. This test frequency is based on the relay reliability assessments presented in References 10, 11, and 12. These reliability assessments are relay specific and apply only to the Westinghouse AR and Potter & Brumfield MDR type relays. SSPS slave relays or any auxiliary relays not addressed by Reference 10 do not qualify for extended surveillance intervals and will continue to be tested at a 92 day Frequency.

WCAP-13900, "EXTENSION OF SLAVE RELAY SURVEILLANCE TEST INTERVALS," APRIL 1994

FOR SFCP ADDITION ONLY

SR 3.3.2.7

SR 3.3.2.7 is the performance of a COT on the RWST level and Containment Pressure Control Start and Terminate Permissives.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found conservative with respect to the Allowable Values specified in Table 3.3.2-1. This test is performed every 31 days. The Frequency is adequate, based on operating experience, considering instrument reliability and operating history data. INSERT 2

31 DAY

FOR SFCP ADDITION ONLY

SURVEILLANCE REQUIREMENTS (continued)

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" has been implemented, this SR is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the NOMINAL TRIP SETPOINT (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the channel shall be declared inoperable. The second Note also requires that the methodologies for calculating the as-left and the as-found tolerances be in the UFSAR.

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, AFW pump start on trip of all MFW pumps, AFW low suction pressure, Reactor Trip (P-4) Interlock, and Doghouse Water Level - High High Feedwater Isolation. It is performed every 18 months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). The Frequency is adequate, based on industry operating experience 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.

OF 18 MONTHS FOR SFCP ADDITION ONLY

INSERT 2

SURVEILLANCE REQUIREMENTS (continued)

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 measured parameter within the necessary range and accuracy.

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

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

INSERT 2

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. The applicable time constants are shown in Table 3.3.2-1.

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" has been implemented, this SR is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the NOMINAL TRIP SETPOINT (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the

SURVEILLANCE REQUIREMENTS (continued)

channel shall be declared inoperable. The second Note also requires that the methodologies for calculating the as-left and the as-found tolerances be in the UFSAR.

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response Time testing acceptance criteria are included in the UFSAR (Ref. 2). Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in both trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

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

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. In addition, while not specifically identified in the WCAP, ITT Barton 386A and 580A-0 sensors were compared to sensors which were identified. It was concluded that the WCAP results could be applied to these two sensor types as well. Response time verification for other sensor types must be demonstrated by test.

SURVEILLANCE REQUIREMENTS (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 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 the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

~~ESF RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. 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.~~

INSERT 2

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 600 psig in the SGs.

SR 3.3.2.11

SR 3.3.2.11 is the performance of a COT on the NSWS Suction Transfer - Low Pit Level.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1. ~~This test is performed every 18 months. The Frequency is adequate based on operating experience.~~

INSERT 2

18 MONTH FOR SFCP ADDITION ONLY

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.12

SR 3.3.2.12 is the performance of an ACTUATION LOGIC TEST on the Doghouse Water Level-High High and NSWS Suction Transfer-Emergency Low Pit Level Functions.

FOR SFCP ADDITION ONLY

An ACTUATION LOGIC TEST to satisfy the requirements of GL 96-01 is performed on each instrumentation to ensure all logic combinations will initiate the appropriate Function. This test is performed every 18 months. The Frequency is adequate based on operating experience.

18 MONTH

INSERT 2

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 7.

3. UFSAR, Chapter 15.

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

7. WCAP-10271-P-A, Supplement 1 and Supplement 2, Rev. 1, May 1986 and June 1990.

8. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" Sep., 1995.

9. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" Oct., 1998.

10. WCAP-13900, "Extension of Slave Relay Surveillance Test Intervals," April 1994.

11. WCAP-13877 Revision 2-P-A, "Reliability Assessment of Westinghouse Type AR Relays Used As SSPS Slave Relays," August 2000.

12. WCAP-13878-P-A Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," August 2000.

13. WCAP-14333-P-A, Revision 1, October 1998.

REFERENCES (continued)

14. ~~WCAP-15376-P-A, Revision 1, March 2003.~~

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that SR 3.3.3.1 and SR 3.3.3.3 apply to each PAM instrumentation Function in Table 3.3.3-1.

SR 3.3.3.1

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

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

INSERT 2

SR 3.3.3.2

Not Used

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.3

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 measured parameter with the necessary range and accuracy. This SR is modified by two Notes. Note 1 excludes neutron detectors. The calibration method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." Note 2 describes the calibration methods for the Containment Area - High Range monitor. The Frequency is based on operating experience and consistency with the typical industry refueling cycle.

INSERT 2

OF 18 MONTHS FOR SFCP ADDITION ONLY

REFERENCES

1. UFSAR Section 1.8.
2. Regulatory Guide 1.97, Rev. 2.
3. NUREG-0737, Supplement 1, "TMI Action Items."
4. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

BASES

ACTIONS (continued)

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.

OF 24 HOURS

FOR SFCP ADDITION ONLY

The

FOR SFCP ADDITION ONLY

INSERT 2

SR 3.5.4.2

The RWST water volume should be verified every 7 days to be above the required minimum level plus instrument uncertainty 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 is normally stable and is protected by an alarm, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

INSERT 2

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 and that the boron content assumed for the injection water in the MSLB analysis is available. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.

INSERT 2

BASES

ACTIONS (continued)

B.1 and B.2

If the affected containment spray train 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 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. The extended interval to reach MODE 5 allows additional time and is reasonable when considering that the driving force for a release of radioactive material from the Reactor Coolant System is reduced in MODE 3.

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1

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

FOR SFCP ADDITION ONLY

Verifying the correct alignment of manual and power operated valves, excluding check valves, in the Containment Spray System provides assurance that the proper flow path exists for Containment Spray System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since they were verified in the correct position prior to being secured. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown or computer status indication, that those valves outside containment and capable of potentially being mispositioned, are in the correct position.

INSERT 2

SR 3.6.6.2

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.3 and SR 3.6.6.4

Not used.

SR 3.6.6.5 and SR 3.6.6.6

These SRs require verification of proper interaction between the CPCS system and the Containment Spray System.

SR 3.6.6.5 deals solely with the containment spray pumps. It must be shown through testing that: (1) the containment spray pumps are prevented from starting in the absence of a CPCS permissive, (2) the containment spray pumps can be manually started when given a CPCS permissive, and (3) when running, the containment spray pumps stop when the CPCS permissive is removed. The "inhibit", "permit", and "terminate" parts of the CPCS interface with the containment spray pumps are verified by testing in this fashion.

SR 3.6.6.6 deals solely with containment spray header containment isolation valves NS12B, NS15B, NS29A, and NS32A. It must be shown through testing that: (1) each valve closes when the CPCS permissive is removed, OR (2) each valve is prevented from opening in the absence of a CPCS permissive. In addition to one of the above, it must also be shown that each valve can be manually opened when given a CPCS permissive.

~~The 18 month Frequency is appropriate based on the reliability of the components.~~

INSERT 2

SR 3.6.6.7

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. The spray nozzles can also be tested using a vacuum blower to induce air flow through each nozzle to verify unobstructed flow. This SR requires verification that each spray nozzle is unobstructed following activities that could cause nozzle blockage. Normal plant operation and activities are not expected to initiate this SR. However, activities such as inadvertent spray actuation that causes fluid flow through the nozzles, major configuration change, or a loss of foreign material control when working within the respective system boundary may require Surveillance performance.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 38, GDC 39, GDC 40, GDC 41, GDC 42, and GDC 43.

2. UFSAR, Section 6.2.

3. 10 CFR 50.49.

4. 10 CFR 50, Appendix K.

5. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

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

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the operation of the ARS. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

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, the ARS is not required to be OPERABLE in these MODES.

ACTIONS

A.1

If one of the required trains of the ARS is inoperable, it must be restored to OPERABLE status within 72 hours. The 72 hour Completion Time was developed taking into account the redundant flow of the OPERABLE ARS train and the low probability of a DBA occurring in this period.

B.1 and B.2

If the ARS train 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 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 3.6.11.1

Verifying that each ARS fan starts on an actual or simulated actuation signal, after a delay ≥ 8 minutes and ≤ 10 minutes, and operates for ≥ 15 minutes is sufficient to ensure that all fans are OPERABLE and that all associated controls and time delays are functioning properly. It also ensures that blockage, fan and/or motor failure, or excessive vibration can be detected for corrective action. ~~The 92 day Frequency was developed considering the known reliability of fan motors and controls and the two train redundancy available.~~

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.11.2

Verifying ARS fan motor current at rated speed with the return air dampers closed confirms one operating condition of the fan. This test is indicative of overall fan motor performance. Since these fans are required to function during post-accident situations, the air density that the fans experience during surveillance testing will be different than the air density following a LOCA. An air density adjustment will be made to the average fan motor current test data before it is compared to the Technical Specification SR acceptance criteria. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of 92 days conforms with the testing requirements for similar ESF equipment and considers the known reliability of fan motors and controls and the two train redundancy available.

INSERT 2

SR 3.6.11.3

Verifying the OPERABILITY of the return air damper provides assurance that the proper flow path will exist when the fan is started. This Surveillance also tests the circuitry, including time delays to ensure the system operates properly. The Frequency of 92 days was developed considering the importance of the dampers, their location, physical environment, and probability of failure. Operating experience has also shown this Frequency to be acceptable.

INSERT 2

SR 3.6.11.4 and SR 3.6.11.5

Verifying the OPERABILITY of the check damper in the air return fan discharge line to the containment lower compartment provides assurance that the proper flow path will exist when the fan is started and that reverse flow can not occur when the fan is not operating. The Frequency of 92 days was developed considering the importance of the dampers, their location, physical environment, and probability of failure. Operating experience has also shown this Frequency to be acceptable.

THE 92 DAY

FOR SFCP ADDITION ONLY

INSERT 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.11.6 and SR 3.6.11.7

These SRs require verification that each ARS motor operated damper is allowed to open or is prevented from opening and each ARS fan is allowed to start or is de-energized or prevented from starting based on the presence or absence of Containment Pressure Control System start permissive and terminate signals. The CPCS is described in the Bases for LCO 3.3.2, "ESFAS." The 18 month Frequency is based on operating experience which has shown it to be acceptable.

INSERT 2

REFERENCES

1. UFSAR, Section 6.2.

2. 10 CFR 50, Appendix K.

3. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

4. NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors."

BASES

ACTIONS (continued)

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 3.6.13.1

Verifying, by means of the Inlet Door Position Monitoring System, that the lower inlet doors are in their closed positions makes the operator aware of an inadvertent opening of one or more lower inlet doors. The Frequency of 12 hours ensures that operators on each shift are aware of the status of the doors.

INSERT 2

SR 3.6.13.2

Verifying, by visual inspection, that each intermediate deck door is closed and not impaired by ice, frost, or debris provides assurance that the intermediate deck doors (which form the floor of the upper plenum where frequent maintenance on the ice bed is performed) have not been left open or obstructed. In determining if a door is impaired by ice, the frost accumulation on the doors, joints, and hinges are to be considered in conjunction with the lifting force limits of SR 3.6.13.7. The Frequency of 7 days is based on engineering judgment and takes into consideration such factors as the frequency of entry into the intermediate ice condenser deck, the time required for significant frost buildup, and the probability that a DBA will occur.

INSERT 2

SR 3.6.13.3

Verifying, by visual inspection, that the top deck doors are in place and not obstructed provides assurance that the doors are performing their function of keeping warm air out of the ice condenser during normal operation, and would not be obstructed if called upon to open in response to a DBA. The Frequency of 92 days is based on engineering judgment, which considered such factors as the following:

INSERT 2

a. The relative inaccessibility and lack of traffic in the vicinity of the doors make it unlikely that a door would be inadvertently left open;

b. Excessive air leakage would be detected by temperature monitoring in the ice condenser; and

BASES

SURVEILLANCE REQUIREMENTS (continued)

c. The light construction of the doors would ensure that, in the event of a DBA, air and gases passing through the ice condenser would find a flow path, even if a door were obstructed.

INSERT 2

SR 3.6.13.4

Verifying, by visual inspection, that the ice condenser lower inlet doors are not impaired by ice, frost, or debris provides assurance that the doors are free to open in the event of a DBA. For this unit, the Frequency of 18 months is based on door design, which does not allow water condensation to freeze, and operating experience, which indicates a low propensity for ice buildup on or behind the doors while the unit is at power. Because of high radiation in the vicinity of the lower inlet doors during power operation, this Surveillance is normally performed during a shutdown.

INSERT 2

SR 3.6.13.5

Verifying the initial opening torque of the lower inlet doors provides assurance that no doors have become stuck in the closed position and maintains consistency with the safety analysis input parameters. Verifying the doors are free to move provides assurance that the hinges and spring closure mechanisms are functioning properly and not degrading. The verifications consist of:

a. Ascertaining the opening torque (torque required to just begin to move the door off of its seal) of each door when pulled (or pushed) open and ensuring this torque is $\leq$ 675 in-lb, as resolved to the vertical hinge pin centerline, and

b. Opening each door manually to the full extent of its available swing arc (i.e., up to slight contact with the shock absorber) and releasing the door, verifying that the spring closure mechanisms are capable of returning the door toward the closed position.

The opening torque test (a) should be performed first to minimize the loss of cold head in the ice condenser and prevent any preconditioning of the seal area. During the freedom of movement test (b) the cold head is not required, and once the effect of cold head is reduced through outflow, the door may not completely return to its seal from the open position.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The opening torque test limiting value of 675 in-lb is based on the design cold head pressure on the closed lower inlet doors of approximately 1 pound per square foot. The Frequency of 18 months is based on the passive nature of the spring closure mechanism and operating experience, which indicates a low propensity for ice buildup on or behind the doors while the unit is at power. Because of high radiation in the vicinity of the lower inlet doors during power operation, this Surveillance is normally performed during a shutdown.

INSERT 2

SR 3.6.13.6

Deleted.

SR 3.6.13.7

Verifying the OPERABILITY of the intermediate deck doors provides assurance that the intermediate deck doors are free to open in the event of a DBA. The verification consists of visually inspecting the intermediate doors for structural deterioration, verifying free movement of the vent assemblies, and ascertaining free movement of each door when lifted with the applicable force shown below:

	Door	Lifting Force
a.	Adjacent to crane wall	≤ 37.4 lb
b.	Paired with door adjacent to crane wall	≤ 33.8 lb
c.	Adjacent to containment wall	≤ 31.8 lb
d.	Paired with door adjacent to containment wall	≤ 31.0 lb

The 18 month Frequency is based on the passive design of the intermediate deck doors, the frequency of personnel entry into the intermediate deck, and the fact that SR 3.6.13.2 confirms on a 7 day Frequency that the doors are not impaired by ice, frost, or debris, which are ways a door would fail the opening force test (i.e., by sticking or from increased door weight).

INSERT 2

REFERENCES

1. UFSAR, Chapter 6.

2. 10 CFR 50, Appendix K.

3. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

BASES

ACTIONS (continued)

The Completion Time of once per 12 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration and ensures that unplanned changes in boron concentration would be identified. The 12 hour Frequency is reasonable, considering the low probability of a change in core reactivity during this time period.

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

SR 3.9.2.1 is the performance of a CHANNEL CHECK which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the two indication channels should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions.

~~The Frequency of 12 hours is consistent with the CHANNEL CHECK Frequency specified similarly for the same instruments in LCO 3.3.1 and LCO 3.3.9.~~

INSERT 2

SR 3.9.2.2

SR 3.9.2.2 is the performance of a CHANNEL CALIBRATION ~~every 18 months~~. This SR is modified by a Note stating that neutron detector sensors (NIS and BDMS) are excluded from the CHANNEL CALIBRATION.

The CHANNEL CALIBRATION for the BF_3 source range neutron flux monitors (NIS) consists of obtaining the detector plateau and pulse height discriminator curves, evaluating those curves, and comparing the curves to the manufacturer's data.

The CHANNEL CALIBRATION for the fission chamber source range neutron detectors and for the source range neutron flux monitors (Gamma-Metrics) consists of verifying that the channels respond correctly to test inputs with the necessary range and accuracy.

~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.~~

INSERT 2

REFERENCES

1. 10 CFR 50, Appendix A, GDC 13, GDC 26, GDC 28, and GDC 29.
2. UFSAR, Sections 4.2, 15.4.6.
3. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).