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10 CFR 50.90

U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: Document Control Desk

Subject: Duke Energy Carolinas, LLC
McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369 and 50-370

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

This letter provides the responses to a request for additional information (RAI) regarding the McGuire License Amendment Request (LAR) dated March 24, 2010 applicable to the relocation of specific surveillance frequencies to a licensee controlled program in accordance with TSTF-425 Revision 3 and NEI 04-10 Revision 1. The RAI request was conveyed by the NRC staff via electronic mail from Jon Thompson on October 21, 2010. The NRC staff's questions and Duke Energy's responses are provided in Enclosure 1.

In addition, Enclosure 2 contains updated Technical Specification (TS) and Bases marked up pages related to four TS changes that were recently approved by the NRC. As communicated on page 3 of Attachment 1 of the subject LAR, there were six LARs pending NRC review and approval that affect surveillances modified by this LAR. Four of the six LARs have been approved by the NRC and implemented by McGuire, while two are still pending. As stated in the LAR, McGuire 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 NRC Approval	Affected TS Surveillances
June 28, 2010	SRs 3.6.13.1, 3.6.13.4, 3.6.13.5 and 3.6.13.6. Modifies Ice Condenser Door SR descriptions and deletes 3.6.13.6.
May 5, 2010	SR 3.8.1.4. Modifies minimum EDG day tank level. Bases page not affected.
August 2, 2010	SR 3.3.1.11. Excore detector replacement modification
August 24, 2010	SR 3.6.6.7. Revises spray nozzle inspection frequency. This SR will no longer relocate to the surveillance frequency control program per TSTF-425.

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.

Please contact Lee A. Hentz at 980-875-4187 if additional questions arise regarding this LAR.

Sincerely,

Regis T. Repko

Enclosures

cc: w/enclosures

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OATH AND AFFIRMATION

Regis T. Repko 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.

Regis T. Repko, Site Vice President

Subscribed and sworn to me: November 18, 2010
Date

Notary Public

My commission expires: July 1, 2012
Date

ENCLOSURE 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI) RELATED TO THE APPLICATION FOR TECHNICAL SPECIFICATION CHANGE REGARDING RISK-INFORMED JUSTIFICATION FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM

Enclosure 1

NRC RAIs and Duke Responses

1. Table 2-1 of Attachment 2 identifies specific unresolved "gaps" of the McGuire 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 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. Revised Table 2-1 is attached to this enclosure.

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 NRC 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 Response:

Table 2-1 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. Revised Table 2-1 is attached to this enclosure.

REVISED TABLE 2-1
STATUS OF IDENTIFIED GAPS IN THE MCGUIRE 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. Structures, Systems and Components (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 common cause failure (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 human reliability analysis (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 human error probabilities (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. Thermal/hydraulic (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 T/H analyses or simulations.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Impact on 5b Applications
Gap #11	Document a review of the human failure events (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-A3 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 McGuire PRA initiating events is consistent with that of its sister plant, Catawba 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 McGuire 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 MCC-1535.00-00-0116, *Potential Internal Initiating Events for the McGuire 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 MCC-1535.00-00-0116 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. The McGuire internal flooding analysis has been upgraded to meet the Standard's requirements. However, this model needs to be incorporated into the base case PRA model.	A plan and schedule are in place for updating the base case PRA model. 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 Reactor Coolant System (RCS) depressurization for small Loss of Coolant Accidents (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 Large Early Release Frequency (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 McGuire and Catawba 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. McGuire success criteria are consistent with those of sister plants included in the Pressurized Water Reactor Owners Group (PWROG) Probabilistic Safety Assessment (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 McGuire, 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.

ENCLOSURE 2

UPDATED TECHNICAL SPECIFICATION AND BASES PAGES

Date of NRC Approval	Affected TS Surveillances
June 28, 2010	SRs 3.6.13.1, 3.6.13.4, 3.6.13.5 and 3.6.13.6. Modifies Ice Condenser Door SR descriptions and deletes 3.6.13.6.
May 5, 2010	SR 3.8.1.4. Modifies minimum EDG day tank level. Bases page not affected.
August 2, 2010	SR 3.3.1.11. Excore detector replacement modification
August 24, 2010	SR 3.6.6.7. Revises spray nozzle inspection frequency. This SR will no longer relocate to the surveillance frequency control program per TSTF-425.

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 position.	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~~
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~~
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
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
SR 3.6.13.6	(deleted)	INSERT 1
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

BASES

ACTIONS (continued)

allowing enough air leakage to cause the maximum ice bed temperature to approach the melting point. The Frequency of 4 hours is based on the fact that temperature changes cannot occur rapidly in the ice bed because of the large mass of ice involved. The 14 day Completion Time is based on long term ice storage tests that indicate that if the temperature is maintained below 27°F, there would not be a significant loss of ice from sublimation. If the maximum ice bed temperature is > 27°F at any time or if the doors are not closed and restored to OPERABLE status within 14 days, the situation reverts to Condition C and a Completion Time of 48 hours is allowed to restore the inoperable door to OPERABLE status or enter into Required Actions D.1 and D.2. Ice bed temperature must be verified within the specified Frequency as augmented by the provisions of SR 3.0.2. Entry into Condition B is not required due to personnel standing on or opening an intermediate deck or top deck door for short durations (< 4 hours) to perform required surveillances, minor maintenance such as ice removal, or routine tasks such a system walkdowns

C.1

If Required Actions B.1 or B.2 are not met, the doors must be restored to OPERABLE status and closed positions within 48 hours. The 48 hour Completion Time is based on the fact that, with the very large mass of ice involved, it would not be possible for the temperature to increase to the melting point and a significant amount of ice to melt in a 48 hour period.

D.1 and D.2

If the ice condenser doors 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 3.6.13.1

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~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency

of 12 hours ensures that operators on each shift are aware of the status of the doors.

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 3

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:

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

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.

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

SURVEILLANCE REQUIREMENTS (continued)

propensity for ice build-up 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.

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 initial conditions. Verifying the doors are free to move provides assurance that the hinges and spring closure mechanisms are functioning properly and not degrading.

The verifications consists 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 ≤ 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.

INSERT 3

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 build-up 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.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

INSERT 3

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).

REFERENCES

1. UFSAR, Chapter 6.

2. 10 CFR 50, Appendix K.

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

4. MCS-1558.NF-00-0001 "Design Basis Specification for the NF System".

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.3	------NOTES------ 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. ------ Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 3600 kW and ≤ 4000 kW.	INSERT 1 31 days
SR 3.8.1.4	Verify each day tank contains ≥ 39 inches of fuel oil.	31 days
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	31 days
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from storage tank to the day tank.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.9	-----NOTES----- Verification of setpoint is not required. ---------- Perform TADOT.	~~92 days~~ INSERT 1
SR 3.3.1.10	-----NOTES----- 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	-----NOTES----- 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. The CHANNEL CALIBRATION may be performed at power or during refueling based on testing capability. Channel unavailability evaluations in References 10 and 11 have conservatively assumed that the CHANNEL CALIBRAITON is performed at power with the channel in bypass.

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.

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.

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. Two 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.11

range neutron detectors consists of two methods. Method 1 consists of obtaining the discriminator curves for source range, evaluating those curves, and comparing the curves to the manufacturer's data (adjustments to the discriminator voltage are performed as required). Method 2 consists of performing waveform analysis. This analysis process monitors the actual number and amplitude of the Neutron/Gamma pulses being generated by the SR detector. The high voltage is adjusted to optimize the amplitude of the pulses while maintaining as low as possible high voltage value in order to prolong the detector life. The discriminator voltage is then adjusted, as required, to reasonably ensure that the neutron pulses are being counted by the source range instrumentation and the unwanted gamma pulses are not being counted as neutron pulses.

The CHANNEL CALIBRATION for the compensated ion chamber intermediate range neutron detectors consists of 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 3

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" (Reference 12) 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

	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~~
SR 3.6.6.4	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	~~18 months~~
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 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 open upon receipt of a start permissive from the Containment Pressure Control System (CPCS).	~~18 months~~
SR 3.6.6.7	Verify each spray nozzle is unobstructed.	Following activities which could result in nozzle blockage

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.3 and SR 3.6.6.4

These SRs require verification that each automatic containment spray valve actuates to its correct position and each containment spray pump starts upon receipt of an actual or simulated Containment Pressure High-High signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

INSERT 3

The surveillance of containment sump isolation valves is also required by SR 3.6.6.3. A single surveillance may be used to satisfy both requirements.

SR 3.6.6.5 and SR 3.6.6.6

These SRs require verification that each containment spray pump discharge valve opens or is prevented from opening and each containment spray pump starts or is de-energized and prevented from starting upon receipt of Containment Pressure Control System start and terminate signals. The CPCS is described in the Bases for LCO 3.3.2, "ESFAS." The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage.

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.