

NRR-DMPSPEm Resource

From: Lamb, John
Sent: Wednesday, April 17, 2019 3:06 PM
To: Joyce, Ryan M.
Subject: REQUEST FOR ADDITIONAL INFORMATION - EDWIN I. HATCH NUCLEAR PLANT UNITS 1 AND 2 APPLICATION TO ADOPT TITLE 10 OF CODE OF FEDERAL REGULATIONS 50.69 RISK-INFORMED CATEGORIZATION AND TREATMENT OF STRUCTURES, SYSTEMS AND COMPONENTS FOR NUCLEAR POWER REACTORS

Importance: High

Dear Mr. Joyce:

By letter dated June 7, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18158A583), Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) for Edwin I. Hatch Nuclear Plant Units 1 and 2 to adopt Title 10 of Code of Federal Regulations (CFR) 50.69, "Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors."

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided in the LAR and determined that additional information is required in order to complete its review. The request for additional information (RAI) is included below. SNC will respond within 90 days from the date of this email.

Sincerely,

John G. Lamb, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos.: 50-321
50-366

REQUEST FOR ADDITIONAL INFORMATION

REQUEST FOR ADDITIONAL INFORMATION FOR THE
LICENSE AMENDMENT REQUESTS TO ADOPT
TITLE 10 OF CODE OF FEDERAL REGULATIONS 50.69 RISK-INFORMED CATEGORIZATION AND
TREATMENT OF STRUCTURES, SYSTEMS AND COMPONENTS FOR NUCLEAR POWER REACTORS
SOUTHERN NUCLEAR OPERATING COMPANY
EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-321 AND 50-361
EPID NO. L-2018-LLA-0175

RAI 01 (APLA/APLB) – Appendix X, Independent Assessment Process

Paragraph 50.69(c)(1)(i) of Title 10 of the Code of Federal Regulations (CFR) requires the Probabilistic Risk Assessment (PRA) to be of sufficient quality and be subjected to a peer review process assessed against a standard or set of acceptance criteria that is endorsed by the U.S. Nuclear Regulatory Commission (NRC).

Section 3.3 of the 10 CFR 50.69 License Amendment Request (LAR) states that resolutions to the Facts and Observation (F&Os) were reviewed and closed using the process in Appendix X to Nuclear Energy Institute (NEI) 05-04, NEI 07-12 and NEI 12-13, as documented in letter dated February 21, 2017 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML17086A431), and as accepted by the NRC, with conditions in letter dated May 3, 2017 (ADAMS Accession No. ML17079A427).

Provide the following information to confirm that the Independent Assessments for closure of F&Os performed for the internal events PRA (IEPRA) (April 2017), the seismic PRA (SPRA) (June 2017), and the fire PRA (FPRA) (October 2017), were performed consistent with the process accepted by the NRC, with conditions, in letter dated May 3, 2017:

- a) Regarding closure of each F&O, confirm that the Independent Assessment team was provided with a written assessment and justification of whether the F&O resolution constitutes a PRA upgrade or maintenance update, as defined in the American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) RA-Sa-2009 PRA Standard and qualified by Regulatory Guide (RG) 1.200, Revision 2 (ADAMS Accession No. ML090410014).
- b) If the request made in part (a) above cannot be confirmed, then perform a subsequent Independent Assessment for F&O closure and/or addendum to the Independent Assessment report to address any identified inconsistencies with Appendix X, as accepted, with conditions, by the NRC staff in letter dated May 3, 2017. Provide any F&Os that remain open as a result of this review. For each F&O and/or item that remains open, provide its associated disposition to demonstrate that it has no adverse impact on the 10 CFR 50.69 application.
- c) List all PRA upgrades, if any, identified during the IEPRA, FPRA and SPRA F&O closure. For each upgrade, confirm that a focused-scope peer review was conducted and provide all F&Os that were generated from the focused scope peer review, along with their associated dispositions for the application.
- d) Appendix X guidance states in part, “[t]he relevant PRA documentation should be complete and have been incorporated into the PRA model and supporting documentation prior to closing the finding.” For closure of F&O(s) after the on-site review, Appendix X guidance explicitly states, “[t]he host utility may, in the time between the on-site review and the finalization of the independent assessment team report, demonstrate that the issue has been addressed, that a closed finding has been achieved, and that the documentation has been formally incorporated in the PRA Model of Record [MOR].”
 - i. Confirm that all model changes associated with the closure of all F&Os reviewed during the Independent Assessment performed in May 2017 were incorporated into the PRA and/or the supporting documentation at the time of the finalization of the Independent Assessment team report, consistent with Appendix X, as accepted, with conditions, by the NRC staff via letter dated May 3, 2017 (ADAMS Accession No. ML17079A427).

OR

- ii. Propose a mechanism that assures all the PRA model logic and all documentation changes reviewed by the Independent Assessment team for the closure of all F&Os in the final Independent Assessment report are incorporated into the MOR(s) prior to implementation of the 10 CFR 50.69 risk-informed categorization.

RAI 02 (APLA) – Internal Flooding Open F&O 4-5, Credit for Manual Flood Isolation

Internal flooding F&O 4-5 related to supporting requirement IFSN-A10 and IFQU-A5 identified that no credit is taken for the manual isolation of floods.

The independent assessment team identified that this F&O identifies a major modeling issue with internal flooding, and that it constitutes significant changes from the previously peer reviewed model. The licensee's disposition states that this is a documentation issue with no impact on the application, and:

"[T]he original flooding evaluation credited manual isolation of flooding using some screening values and some detailed [human reliability analysis] (HRA). A subsequent revision removed all credit for isolation but performed a flooding screening analysis. Then a third revision re-applied the previous HRA analysis to the scenarios that passed the screening."

- a) Clarify whether the internal flooding PRA (IFPRA) model that will be used for the 10 CFR 50.69 categorization process credits manual flooding isolation.
- b) If the IFPRA does not credit manual flooding isolation, provide justification for why this exclusion has no adverse impact on the 10 CFR 50.69 application.
- c) If the IFPRA credits manual flooding isolation, address the following:
 - i. Provide date of when the version of the PRA model that credits manual flooding isolation was peer reviewed, and a brief description of the PRA model that was peer reviewed (e.g, detailed HEPs developed, screening values applied, etc.).
 - ii. Describe any further modeling changes that were performed in the PRA after the peer review identified in part (i) above (e.g., additional HEPs developed, HEPs removed, screening values applied, etc.).
 - iii. Provide justification for why the change to credit manual flooding isolation in the IFPRA is either a PRA upgrade or maintenance update in accordance with the ASME/ANS RA-Sa-2009 PRA standard.
 - iv. If a PRA upgrade is determined in part (iii) above, confirm that a focused-scope peer review was conducted and provide the resulting F&Os along with the disposition for each F&Os impact on the 10 CFR 50.69 application. Alternatively, propose a mechanism in response to RAI 13 that ensures that, prior to implementation of the 10 CFR 50.69 categorization process, a focused-scope peer review will be conducted for the credit for manual flood isolation in the IFPRA, and any resulting F&Os will be closed using the Appendix X Independent Assessment Process, as accepted, with conditions, by the NRC staff in letter dated May 3, 2017.

RAI 03 (APLA) – Hatch FPRA under Review for Adoption to NFPA-805

Paragraphs 50.69(c)(1)(i) and (ii) of 10 CFR require a licensee's PRA be of sufficient quality and level of detail to support the system, structures, and components (SSCs) categorization process, and that all aspects of the integrated, systematic process used to characterize SSC importance must reasonably reflect the current plant configuration and operating practices, and applicable plant and industry operational experience.

Section 3 of the 10 CFR 50.69 LAR states that a LAR was submitted requesting transition to the National Fire Protection Association (NFPA) 805 Performance-Based Standard for Fire Protection (ADAMS Accession No. ML18096A955). Attachment 1 of the 10 CFR 50.69 LAR lists several plant modifications that are credited in the FPRA risk estimates for the NFPA 805 LAR to meet the risk acceptance guidance of RG 1.174, Revision 3 (ADAMS Accession No. ML17317A256). Attachment S of the NFPA 805 LAR lists several implementation items (such as updating of the fire response procedures) that are also credited in the FPRA to meet the risk acceptance guidelines discussed in RG 1.174, Revision 3.

Because there is a potential for additional FPRA model changes to resolve requests for additional information (RAIs) associated with the staff determination of acceptability of the FPRA for approval of the Hatch adoption of NFPA 805 LAR that is currently under NRC staff review, address the following:

- a) Confirm that all the NFPA 805 plant modifications, implementation items, and FPRA model changes necessary to resolve questions associated with the NFPA-805 LAR review are complete, or alternatively, propose a mechanism to ensure that all these items are complete prior to the implementation of the 10 CFR 50.69 categorization process. This mechanism should also provide an explicit description of changes that will be made to the PRA model(s) and/or documentation to resolve the identified issues. An example would be a table of listed implementation items referenced in a license condition.
- b) Alternatively to item (a) above, address the following:
 - i. Provide detailed justification that the NFPA 805 modifications, implementations items and FPRA model changes necessary to resolve questions associated with the NFPA-805 LAR review have no impact the PRA models (i.e., IEPRAs, FPRA and SPRA) used for the 10 CFR 50.69 application.
 - ii. If any plant modifications, implementations items or FPRA model changes necessary to resolve questions associated with the NFPA-805 LAR review are determined to impact the PRA models (i.e., IEPRAs, FPRA and SPRA) and documentation, address the following:
 - 1. Provide explicit description for how they will be addressed in the PRA models that will be used for the 10CFR 50.69 categorization.
 - 2. Confirm the status of the plant modifications and how the PRA models will reflect the as-built and as-operated plant at the time of implementation of the 10 CFR 50.69 process.
 - 3. Provide detailed description and justification for any alternative PRA modeling that is not subject to the NRC staff review for the NFPA-805 application or the 10 CFR 50.69 application (e.g., subsequent removal of credit for modifications).
 - iii. Provide any updated Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) estimates resulting from removal of credit for the NFPA-805 modifications and/or implementation items to confirm that the acceptance criteria for total CDF and LERF values provided in RG 1.174, Revision 3 (ADAMS Accession No. ML17317A256) remain met .

RAI 04 (APLA/APLB) – Process for Identification of Key Assumptions and Sources of Uncertainties

Paragraphs 50.69(c)(1)(i) and (ii) require a licensee’s PRA to be of sufficient quality and level of detail to support the SSC categorization process, and that all aspects of the integrated, systematic process used to characterize SSC importance must reasonably reflect the current plant configuration and operating practices, and applicable plant and industry operational experience. The guidance in NEI 00-04, “10 CFR 50.69 SSC Categorization Guideline,” (ADAMS Accession No. ML052910035), specifies sensitivity studies to be conducted for each PRA model. The sensitivity studies are performed to ensure that assumptions associated with these uncertainty parameters (e.g., human error, common cause failure, and failure probabilities) do not mask the SSC(s) importance.

LAR Section 4.1 identifies RG 1.174, Revision 2 (ADAMS Accession No. ML100910006), as an applicable regulatory requirement/criterion. RG 1.174 has been updated to Revision 3, dated January 2018 (ADAMS Accession No. ML17317A256). Regulatory Guide 1.174, Revision 3, cites NUREG-1855, Revision 1, “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making” (ADAMS Accession No. ML17062A466), as related guidance. In Section B of RG 1.174, Revision 3, the guidance acknowledges specific revisions of NUREG-1855 to include changes associated with expanding the discussion of uncertainties. LAR Section 3.2.7 states that the detailed process of identifying, characterizing and qualitative screening of model uncertainties is found in Section 5.3 of NUREG-1855, March 2009, Revision 0 (ADAMS Accession No. ML090970525) and Section 3.1.1 of EPRI Technical Report (TR)-1016737, “Treatment of Parameter and Model Uncertainty for Probabilistic Risk Assessments”. The NRC staff notes that for the IEPRAs (includes internal flooding), FPRA, and SPRA models, only three, two, and five sources of uncertainty were identified, respectively.

NUREG-1855 has been updated to Revision 1 as of March 2017 (ADAMS Accession No. ML17062A466). The NRC staff notes that NUREG-1855, Revision 1, provides guidance in stages A through F for how to treat uncertainties associated with PRA models in RI decision-making. Revision 1 of NUREG-1855 cites EPRI TR-1026511, "Practical Guidance on the Use of Probabilistic Risk Assessment in Risk-Informed Applications with a Focus on the Treatment of Uncertainties."

Additionally, Section 3.3.2 of RG 1.200 Revision 2 defines key assumptions and sources of uncertainty as follows:

*A **key assumption** is one that is made in response to a key source of model uncertainty in the knowledge that a different reasonable alternative assumption would produce different results, or an assumption that results in an approximation made for modeling convenience in the knowledge that a more detailed model would produce different results. For the base PRA, the term "different results" refers to a change in the risk profile (e.g., total CDF and total LERF, the set of initiating events and accident sequences that contribute most to CDF and to LERF) and the associated changes in insights derived from the changes in the risk profile. A "reasonable alternative" assumption is one that has broad acceptance within the technical community and for which the technical basis for consideration is at least as sound as that of the assumption being challenged.*

*A **key source of uncertainty** is one that is related to an issue in which there is no consensus approach or model and where the choice of approach or model is known to have an impact on the risk profile (e.g., total CDF and total LERF, the set of initiating events and accident sequences that contribute most to CDF and to LERF) such that it influences a decision being made using the PRA. Such an impact might occur, for example, by introducing a new functional accident sequence or a change to the overall CDF or LERF estimates significant enough to affect insights gained from the PRA.*

The NRC staff requests the following information to confirm the key assumptions and sources of uncertainty provided in Attachment 6 of the LAR were properly assessed from the base PRAs that have received peer reviews:

- a) A description of the process and the criteria used to identify, from the initial comprehensive list of uncertainties and assumptions for the base PRA model(s) (including those associated with plant specific features, modeling choices, and generic industry concerns), the application specific key assumptions and sources of uncertainties provided in LAR Attachment 6. Describe how the key assumptions and sources of uncertainty are determined consistent with the definitions in RG 1.200 Revision 2. The descriptions should be provided separately for internal hazard PRAs (including internal fire) and external hazard PRAs supporting this application.
- b) Provide a summary list of the key assumptions and sources of uncertainty that have been identified for the application.
- c) Confirm that the process is consistent with NUREG-1855, Revision 1, or other NRC-accepted methods (e.g., NUREG-1855, Revision 0). If deviating from the current guidance provided in NUREG-1855, Revision 1, provide a basis to justify the use of the method(s) in the 10 CFR 50.69 categorization process (e.g., exclusion/consideration of EPRI TR-1026511).

RAI 05 (APLA) – Dispositions of Key Assumptions and Sources of Uncertainties

Paragraph 50.69(c)(1)(i) of 10 CFR requires the licensee to consider the results and insights from the PRA during categorization. The guidance in Section 5 of NEI 00-04 specifies sensitivity studies to be conducted for each PRA model. The sensitivity studies are performed to ensure that assumptions and sources of uncertainty (e.g., human error, common cause failure, and maintenance probabilities) do not mask importance of components. NEI 00-04 guidance states that additional "applicable sensitivity studies" from characterization of PRA adequacy should be considered.

LAR Section 3.2.7 states that “a few system specific sensitivity analyses may be required to address Hatch model specific assumptions or sources of uncertainty.” Multiple dispositions provided in LAR Attachment 6, Table 6-3 appear to indicate that no key assumptions or sources of uncertainty were identified that will require a sensitivity study consistent with Section 5 of the NEI 00-04 guidance for the 10 CFR 50.69 categorization process.

The NRC staff observes that modelling conservatisms can mask the importance measures of other SSCs. Considering these observations, address the following:

- a) For any additional key assumptions/sources of uncertainty identified as a result of RAI 04 response, discuss how each identified key assumption and uncertainty will be dispositioned in the categorization process. The discussion should clarify whether the licensee is following the guidance in Section 5 of NEI 00-04 by performing sensitivity analysis or other accepted guidance such as NUREG-1855 Stages A and F. The summaries and descriptions should be provided separately for the identified key assumptions and uncertainties related to internal hazard PRAs (including internal fire) and those related to external hazard PRAs supporting this application.
- b) The disposition for the first item of LAR Attachment 6, Table 6-3 states in part that the uncertainty associated with untraced secondary-side cables was addressed for the FPRA using a sensitivity study to assess the assumption that secondary-side systems fail in all fires. This sensitivity study and its results are not discussed in either the NFPA 805 LAR or the 10 CFR 50.69 LAR. Accordingly, it is not clear that this sensitivity study (i.e., the assumption that all secondary-side systems fail in a fire) performed for the FPRA is applicable to 10 CFR 50.69 categorization. Considering these observations:
 - i. Provide the quantitative results of the sensitivity study and/or justification to support the conclusion that the uncertainty associated with untraced secondary-side cables has no impact on the 10 CFR 50.69 categorization process. Include summary of the systems or components with untraced cables and explain how their functions are assumed to be impacted in the baseline fire PRA and sensitivity study case. Include in the justification the following: (1) a description of the sensitivity study that was performed for the FPRA, (2) an explanation of how it considered the potential to mask or skew the importance of certain SSCs, and (3) an explanation of how the sensitivity study bounds the source of uncertainty being addressed.

OR

- ii. If the uncertainty addressed in part (i) above cannot be justified to have no adverse impact on the 10 CFR 50.69 categorization process, then propose a mechanism that ensures that a sensitivity study is performed during the 10 CFR 50.69 categorization process. Include a brief discussion of the sensitivity study proposed and how it addresses the uncertainty associated with untraced secondary-side cables. Include in the justification the following: (1) a description of the sensitivity study that is proposed, (2) an explanation of how it considers the potential to mask or skew the importance of certain SSCs and (3) an explanation of how the sensitivity study bounds the uncertainty associated with untraced secondary-side cables. An example would be a table of listed implementation items referenced in a license condition.

OR

- iii. Propose a mechanism that eliminates the uncertainty associated with the untraced secondary-side cables. This mechanism should also provide an explicit description of changes that will be made to the PRA model(s) and/or documentation to resolve this issue. If these changes are determined to involve a PRA upgrade, the mechanism should include a focused-scope peer review and require resolution of all generated finding-level F&Os from the peer review prior to implementation of the 10 CFR 50.69 categorization process. An example would be a table of listed implementation items referenced in a license condition.

RAI 06 (APLA/APLB) - Addition of FLEX to the PRA Model

The NRC memorandum dated May 30, 2017, "Assessment of the NEI 16-06, 'Crediting Mitigating Strategies in Risk-Informed Decision Making,' Guidance for Risk-Informed Changes to Plants Licensing Basis" (ADAMS Accession No. ML17031A269), provides the NRC's staff assessment of identified differences between NEI 16-06 guidance and the guidance in RG 1.200 Revision 2 for incorporating diverse and flexible (FLEX) coping strategies and equipment into a PRA model in support of risk-informed decision making. LAR Attachment 6, LAR Table 6-2 indicates that FLEX is credited in the SPRA and does not address whether it is credited in the IEPRAs or FPRAs. For the NRC staff to determine the acceptability of incorporation of FLEX equipment into the PRA model(s) provide the following:

- a) Confirm whether FLEX equipment and associated operator actions have been credited in the IEPRAs, FPRAs, and/or the SPRA.
- b) If FLEX equipment or operator actions have been credited in the PRA, address the following, separately for IEPRAs (includes internal flooding), FPRAs, SPRA, and external hazards screening as appropriate:
 - i. Summarize the supplemental equipment and compensatory actions, including FLEX strategies that have been quantitatively credited for each of the PRA models used to support this application. Include discussion of whether the credited FLEX equipment is portable or permanently installed equipment.
 - ii. Discuss whether the credited equipment (regardless of whether it is portable or permanently-installed) are similar to other plant equipment (i.e. SSCs with sufficient plant-specific or generic industry data) and whether the credited operators actions are similar to other operator actions evaluated using approaches consistent with the endorsed ASME/ANS RA-Sa-2009 PRA standard.
 - iii. If any credited FLEX equipment is dissimilar to other plant equipment credited in the PRA (i.e. SSCs with sufficient plant-specific or generic industry data), discuss the data and failure probabilities used to support the modeling and provide the rationale for using the chosen data. Discuss whether the uncertainties associated with the parameter values are in accordance with the ASME/ANS PRA Standard as endorsed by RG 1.200 Revision 2.
 - iv. If any operator actions related to FLEX equipment are evaluated using approaches that are not consistent with the endorsed ASME/ANS RA-Sa-2009 PRA Standard (e.g., using surrogates), discuss the methodology used to assess human error probabilities for these operator actions. The discussion should include:
 1. A summary of how the impact of the plant-specific human error probabilities and associated scenario-specific performance shaping factors listed in (a)-(j) of supporting requirement HR-G3 of the ASME/ANS RA-Sa-2009 PRA Standard were evaluated.
 2. Whether maintenance procedures for the portable equipment were reviewed for possible pre-initiator human failures that renders the equipment unavailable during an event, and if the probabilities of the pre-initiator human failure events were assessed as described in HLR-HR-D of the ASME/ANS RA-Sa-2009 PRA Standard.
 3. If the procedures governing the initiation or entry into mitigating strategies are ambiguous, vague, or not explicit, a discussion detailing the technical bases for probability of failure to initiate mitigating strategies.
- c) The ASME/ANS RA-Sa-2009 PRA standard defines PRA upgrade as the incorporation into a PRA model of a new methodology or significant changes in scope or capability that impact the significant accident sequences or the significant accident progression sequences. Section 1-5 of Part 1 of ASME/ANS RA-Sa-2009 PRA Standard states that upgrades of a PRA shall receive a peer review in accordance with the requirements specified in the peer review section of each respective part of this Standard.

Provide an evaluation of the model changes associated with incorporating mitigating strategies, which demonstrates that none of the following criteria is satisfied: (1) use of new methodology, (2) change in scope that impacts the significant accident sequences or the significant accident progression sequences, and (3) change in capability that impacts the significant accident sequences or the significant accident progression sequences;

- d) LAR Attachment 6 Table 6-2 states that the uncertainty associated with credit taken for FLEX implementation in the SPRA will be addressed by the human reliability analysis (HRA) sensitivity study performed as part of 10 CFR 50.69 categorization. The HRA sensitivity study performed as part of the categorization process increases all human error probabilities (HEPs) to their 95th percentile value. The disposition also states that the results of a sensitivity study, in which FLEX was assumed to completely fail, showed a significant increase in seismic CDF (41%) and LERF (57%) demonstrating that credit for FLEX is important to seismic risk. The NRC staff notes that the HRA methodologies used to calculate HEP values for FLEX actions, which may occur outside the main reactor buildings and may not be part of a normal or emergency operating procedure, should be consistent with technical elements of the NRC endorsed ASME/ANS PRA Standard (e.g., consideration of environmental conditions). Accordingly, it is not clear to the NRC staff that a sensitivity study using the 95th percentile value for the failure probability of FLEX operator actions is sufficient to address the uncertainty associated with FLEX actions and the lack of industry failure rate information for FLEX equipment.

The disposition in Attachment 6 of the LAR for the above key source of uncertainty also states in part, the treatment of this uncertainty has minimal impact on the application because the seismic risk is small compared to the overall risk. The NRC staff notes that for 10 CFR 50.69 categorization the uncertainty associated with crediting FLEX equipment and actions impacting the seismic importance of SSCs and could skew the integrated importance of certain SSCs.

Considering these observations:

- i. Provide justifications that the HEP 95th percentile value sensitivity study is sufficient to address the uncertainty associated with crediting FLEX equipment and operator actions in the SPRA.
- ii. If the HEP 95th percentile value sensitivity study cannot be justified to be sufficient to address the uncertainty associated with crediting FLEX equipment and operator actions in the SPRA in response to part (iii) above, then propose a mechanism to ensure that a separate acceptable sensitivity study is performed as part of 10 CFR 50.69 categorization to address the use of FLEX equipment and operator actions in the SPRA.

RAI 07 (APLB) – Seismic PRA Screened SSCs

Section 5.1 of NEI 00-04 provides guidance on the use of importance measures for identifying the "candidate safety significance" of components during the categorization process. Based on the information provided in the LAR, the NRC staff was unable to determine whether the potential use of capacity-based screening level in the licenss's SPRA is consistent with the guidenace for developing importance measure to identify candidate safety significance.

Describe whether a capacity-based screening level is used in the SPRA and how the potential use of the screening level maintains consistency with the importance measure criteria in NEI 00-04 or justify any deviations from the guidance by using the selected screening level. This justification may include demonstration of the impact of the selected screening level in the SPRA on the importance measure criteria and the categorization of SSCs.

RAI 08 (APLB) – Use of Addendum B of the PRA Standard (2013)

Paragraph 50.69(c)(1)(i) of 10 CFR requires the PRA to be of sufficient quality and be subjected to a peer review process assessed against a standard or set of acceptance criteria that is endorsed by the NRC.

Section 3.2.3 of the LAR indicates that the SPRA model was peer reviewed using the requirements in Addendum B of the PRA Standard (ASME/ANS RA-Sb-2013, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications"), which has not been endorsed by the NRC. LAR Section 3.2.3 also references discussion in the Vogtle 10 CFR 50.69 LAR (ADAMS Accession No. ML17173A875), as supplemented, justifying use of Addendum B based on an assessment of the differences between Addendum A and B Supporting Requirements (SRs). That assessment included evaluation of the Vogtle SPRA to Addendum A for SRs identified to be different from or not encompassed by the requirements in the Addendum B SRs. The licensee indicates that the SPRA peer review based on Addendum B can be justified using the Vogtle experience.

Section 3.3.1.1 of the Vogtle 10 CFR 50.69 Safety Evaluation (SE) (ADAMS Accession No ML18180A062) accepted the use of the 2013 PRA Standard based on (1) the discussion provided in the Vogtle LAR, (2) Vogtle's comparison of Addendum B to Addendum A SRs in a report titled "Response to Supplemental Information Needed for Acceptance of Systematic Risk-Informed Assessment of Debris Technical Report (ADAMS Accession No. ML17192A245); and (3) a response to a request for additional information clarifying the acceptability of a practice used in the Vogtle SPRA associated with SR SFR-C6. The assessment of debris report defined four comparison categories: (1) "Addendum B Equates to Addendum A", (2) Addendum B Envelopes Addendum A," (3) "Vogtle Conforms to Addendum A," and (4) "Vogtle Conforms to Accepted Current Practices." The NRC staff notes that the first two comparison categories concern generic resolutions and, therefore, are expected to apply to the Hatch SPRA, but the remaining two comparison categories (i.e., "Vogtle Conforms to Addendum A, and "Vogtle Conforms to Accepted Current Practices") involve plant-specific resolutions. The NRC staff also notes that these two later categories were only applied to a limited set of SRs (i.e., SHA-B3, SHA-C3, SFR-C3, SFR-G3, SPR-B1, and SFR-C6).

In light of the observations above, confirm that the generic resolutions are applicable to the SPRA and provide plant-specific justification that the SPRA is in conformance with Addendum A SRs SHA-B3, SHA-C3, SFR-C3, SFR-G3, SPR-B1 and SFR-CR (C-II where it applies); or that the SPRA conforms to an industry practice considered more current than the practice required by Addendum A (e.g., like Vogtle did for SR SFR-C6).

RAI 09 (APLB) - Seismic PRA Peer Review Criteria

Paragraph 50.69(c)(1)(i) of 10 CFR requires the PRA must be of sufficient quality and be subjected to a peer review process assessed against a standard or set of acceptance criteria that is endorsed by the NRC. LAR Section 3.3 states that the PRA models have been assessed against RG 1.200, Revision 1.

Section 2.2 of RG 1.200 provides regulatory guidance regarding peer reviews and the staff regulatory position on NEI 00-02, 05-04, and 07-12. NRC letter, 'U.S. Nuclear Regulatory Commission Acceptance of NEI Guidance NEI 12-13, "External Hazards PRA Peer Review Process Guidelines' (August 2012)," dated March 7, 2018 (ADAMS Accession No. ML18025C025), provides the NRC staff's comments on this guidance for seismic and external hazard PRA peer reviews. Based on the information provided in the LAR the NRC staff was unable to determine if the SPRA peer review and focused scope peer review considered the NRC staff's comments in the March 7, 2018 letter.

Discuss how SPRA peer review and focused-scope peer review considered the NRC staff's comments in the March 7, 2018 NRC acceptance letter. In addition, provide justifications for not considering specific comments in the acceptance letter in the context of this application if applicable.

RAI 10 (APLA/APLB) - SSC Categorization Based on Other External Hazards

Paragraph 50.69(b)(2)(ii) of 10 CFR requires that the quality and level of detail of the systematic processes that evaluate the plant for external events during operation to be adequate for the categorization of SSCs.

LAR Section 3.2.4 indicates that all other hazards were screened from applicability to Hatch Units 1 and 2 per a plant-specific evaluation in accordance with the criteria in Part 6 of the ASME/ANS PRA Standard RA-Sb-2013. This statement appears to indicate that the licensee proposes to treat all SSCs as low-safety-significant (LSS) with respect to other external events risk. The LAR provides no further explanation of how the risk for

other external hazards will be considered in 10 CFR 50.69 categorization (i.e., components being categorized that participate in screened scenarios and whose failure would result in an unscreened scenario). LAR Attachments 4 and 5 provide a summary of the other external hazards screening results, but do not appear to address any considerations related to applying Figure 5-6 of NEI 00-04 guidance to those hazards. Considering these observations, address the following:

- a) LAR Section 3.2.4 states that external hazards were screened using the criteria in Part 6 of the ASME/ANS RA-Sb-2013 PRA Standard. LAR Attachment 5 appears to list the criteria from the ASME/ANS RA-Sa-2009 PRA Standard. Clarify and justify the version of criteria used for the screening of external hazards.
- b) Identify the external hazards that will be evaluated according to the flow chart in NEI 00-04, Section 5.4, Figure 5-6. Provide detailed justification for screening external hazards (i.e., external flood, high winds, and tornados) using the criteria described in part a above. As applicable, the justification should include consideration of uncertainties in the determination of demonstrably conservative mean values, as discussed in Section 6.2-3 of the ASME/ANS RA-Sa-2009 PRA Standard.
- c) LAR Attachment 4 states, regarding the extreme wind and tornado hazard, that “[c]alculations show that the initiator probability is 3.3E-06 and the CCDP is 1E-03.” Provide detailed justification for concluding that for the high winds and tornados hazard, the screening criterion PS3 applies (i.e., the mean frequency is less than 1×10^{-5} per reactor-year and the mean conditional core damage probability is less than 0.1).
- d) Figure 5-6 of NEI 00-04 shows that if an SSC is included in a screened scenario, then in order for that SSC to be considered a candidate LSS, the licensee has to show that if the component was removed, the screened scenario would not become unscreened.
 - i. Identify and justify what type of SSCs, if any, are credited in the screening of the external hazard(s), including both passive, active, and temporary features (e.g., flood barriers, sump pumps, and tornado missile shielding).
 - ii. If there are any SSCs credited for screening of the external hazard(s), then explain and justify how the guidance in Figure 5-6 of NEI 00-04 will be applied for each of the external hazard(s).
- e) If the external hazards cannot be screened out in item (a) above, discuss, using quantitative or qualitative assessments, how the risk from those hazards will be considered in the categorization program. The discussion should include consideration of and, as applicable, the basis for the following factors:
 - The frequency of the external hazard(s),
 - The impact of the external hazard(s) on plant SSCs and plant’s operation including the ability to respond to the external hazard initiating event,
 - The operating experience associated with reliability of the external hazard(s) protection measures, and
 - The reliability of operator actions.

RAI 11 (APLB) – Seismic importance measures

NEI 00-04, Section 5.6, “Integral Assessment,” discusses the need for an integrated computation using the available importance measures. It further states, in part, that the “integrated importance measure essentially weights the importance from each risk contributor (e.g., IE, FPRA, and SPRAs) by the fraction of the total CDF [or LERF] contributed by that contributor.” The guidance provides formulas to compute the integrated Fussell-Vesely (FV), and integrated Risk Achievement Worth (RAW).

To confirm that the importance measures generated for use in the 10 CFR 50.69 process are consistent with the NEI guidance and do not inadvertently introduce a deviation from the computations for FV and RAW provided in the NEI 00-04 guidance, as endorsed by RG 1.201, Revision 1, “Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to Their Safety Significance” (ADAMS Accession No. ML061090627), address the following:

Discuss how the individual importance measures (i.e., FV and RAW) for the PRA model are derived considering the different hazards, specifically for those hazards that discretized SSC functions into 'bins'. The discussion should include justification of why the importance measures generated do not deviate from the NEI guidance. If the practice or method used to generate the integrated importance measures is determined to deviate from the NEI guidance, justify why the integrated importance measures computed are appropriate for use in the categorization process.

RAI 12 (APLA) – Implementation Items

10 CFR 50.69(b)(2)(ii) requires that a licensee's application contain a description of the measures taken to assure that the quality and level of detail of the systematic processes that evaluates the plant for internal and external events during normal operation, low power, and shutdown are adequate for the categorization of SSCs.

If the responses to any of the 50.69 RAI 01 through RAI 11 above or the responses to any of the requests for additional information related to the NFPA-805 application require any follow-up actions prior to implementation of the 10 CFR 50.69 categorization process, provide a list of those actions and any PRA modeling changes, including any items that will not be completed prior to issuing the amendment, but must be completed prior to implementing the 10 CFR 50.69 categorization process.

Propose a mechanism that ensures these activities and changes will be completed and appropriately reviewed and any issues resolved prior to implementing the 10 CFR 50.69 categorization process. An example would be a table of listed implementation items referenced in a license condition.

As an alternative to providing an implementation item for an F&O, demonstrate that the F&O(s) will have no adverse impact and/or insignificant impact on the 10 CFR 50.69 categorization process.

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