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To: Sparkman, Wesley A.; Joyce, Ryan M.
Cc: Miller, Ed; Williams, Shawn
Subject: Farley 50.69 RAIs
Attachments: Farley 50.69 FINAL RAIs To FNP.doc

Wes, Ryan,

Attached are the NRC staff's requests for additional information (RAIs) for Farley's proposed amendment to adopt 10 CFR 50.69 (ML20170B114).

During the clarification call between the NRC and SNC held on January 6, 2021, SNC requested 45 days to respond to the RAIs, so the staff anticipates SNC's response to the attached RAIs by Friday, February 26, 2021.

Regards,

stephanie

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REQUEST FOR ADDITIONAL INFORMATION
OFFICE OF NUCLEAR REACTOR REGULATION
Issue Date: January 12, 2021

Joseph M. Farley Nuclear Plant, Units 1 and 2 – Application to Adopt 10 CFR 50.69, "Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors"

Southern Nuclear Operating Co.

Dockets: 05000348-PWR-Farley 1,05000364-PWR-Farley 2

EPIDS: L-2020-LLA-0134

Question Number: 71

Paragraph (b)(2)(ii) of 10 CFR 50.69 requires that the quality and level of detail of the systematic processes that evaluate the plant for external events during operation are adequate for the categorization of Structures, Systems, and Components.

In the LAR, the licensee proposes to address seismic hazard risk using the alternative seismic approach for seismic Tier-1 plants described in Electric Power Research Institute (EPRI) Report 3002017583, "Alternative Approaches for Addressing Seismic Risk in 10 CFR 50.69 Risk-Informed Categorization" (<https://www.epri.com/research/products/000000003002017583>) and other qualitative considerations. The NRC staff understands that EPRI 3002017583 is an updated version of EPRI 3002012988 that was reviewed in conjunction with its review of the Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2, LAR for adoption of 10 CFR 50.69 (precedent) dated November 28, 2018 (ADAMS Accession No. ML 18333A022). The staff has not reviewed or endorsed EPRI 3002012988 as a topical report for generic use. As such, each licensee needs to perform a plant-specific review for applicability of the Tier-1 alternative seismic approach. The NRC staff reviewed and approved CCNPP's alternative seismic approach, which was based on information for Tier-1 plants included in EPRI 3002012988 and information provided in the supplements to the CCNPP LAR. Information in the supplements to the CCNPP LAR (ADAMS Accession Nos. ML19130A180, ML19200A216, ML19217A143, and ML19183A012) that was used to support the staff's review and approval of that approach is included in the staff's safety evaluation for the CCNPP LAR (ADAMS Accession No. ML19330D909).

The NRC staff notes that the licensee's proposed alternative seismic approach is similar to that reviewed and approved in the CCNPP safety evaluation. However, the licensee's proposed approach is based on information for Tier-1 plants as described in EPRI 3002017583 instead of EPRI 3002012988.

Further, the staff notes that EPRI 3002017583 does not contain all the information in the supplements to the CCNPP LAR that supported the use of EPRI's alternative seismic approach for Tier-1 plants in the CCNPP plant-specific safety evaluation. Therefore, the licensee is requested to address the following:

- (a) The licensee cited EPRI report 3002017583 as applicable to their submittal, please submit EPRI report 3002017583 on the docket.
- (b) Identify and describe the differences between EPRI 3002017583 and EPRI 3002012988.
- (c) Explain whether EPRI 3002017583 includes all the information from the CCNPP LAR supplements that was used to support the staff's review of the alternative seismic approach for Tier-1 plants described in EPRI 3002012988. If any information from the CCNPP LAR supplements are not included in EPRI 3002017583, justify such exclusion for the licensee's proposed alternative seismic approach or indicate

where it is addressed in the licensee's application for Farley.

- (d) Based on the responses to items (b) and (c), justify why a separate staff review of EPRI 3002017583 for the licensee's proposed alternative seismic approach is not warranted.
- (e) Identify and justify any differences between the licensee's proposed alternative seismic approach and the NRC staff approval of the precedent documented in the CCNPP safety evaluation, including any Farley-specific considerations.

Question Number: 130

The NRC memorandum dated May 30, 2017, "Assessment of the Nuclear Energy Institute 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 challenges to incorporating FLEX equipment and strategies into a PRA model in support of risk-informed decision making in accordance with the guidance of RG 1.200, Revision 2.

Section 3.3 of the LAR mentions the PRA modeling of FLEX equipment and FLEX operator actions. More information is needed for the NRC staff to determine the acceptability of incorporation of FLEX equipment into the PRA models. Please provide the following information for the internal events and internal flooding PRAs, as appropriate:

- (a) A discussion detailing the extent of incorporation, i.e., summarizing the supplemental equipment and compensatory actions, including FLEX strategies, that have been credited quantitatively for each of the PRA models used to support this application.
- (b) A discussion detailing the methodology used to assess the failure probabilities of any modeled equipment credited in the licensee's mitigating strategies (i.e., FLEX). The discussion should include a justification of the rationale for parameter values, and how the uncertainties associated with the parameter values are considered in the categorization process in accordance with ASME/ANS RA-Sa-2009, as endorsed by RG 1.200 (e.g., supporting requirements for HLR-DA-D).
- (c) A discussion detailing the methodology used to assess operator actions related to FLEX equipment and the licensee personnel that perform these actions. The discussion should include:
 - i. A summary of how the licensee evaluated 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 ASME/ANS RA-Sa-2009, as endorsed by RG 1.200.
 - ii. Whether maintenance procedures for the portable equipment were reviewed for possible pre-initiator human failures that renders the equipment unavailable during an event, and whether the probabilities of the pre-initiator human failure events were assessed as described in HLR-HR-D of ASME/ANS RA-Sa-2009, as endorsed by RG 1.200.
 - iii. If the licensee's procedures governing the initiation or entry into mitigating strategies are ambiguous, vague, or not explicit, a discussion detailing the technical basis for probability of failure to initiate mitigating strategies.
- (d) ASME/ANS RA-Sa-2009 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 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.
 - i. 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, (3) change in capability that impacts the significant accident sequences or the significant accident progression sequences,

OR

- ii. Propose a mechanism to ensure that a focused-scope peer review is performed on the model changes associated with incorporating mitigating strategies, and associated F&Os are resolved to Capability Category II prior to implementation of the 10 CFR 50.69 categorization program.

- (e) OR, as an alternative to Parts (a), (b), (c), and (d), above: Remove credit for FLEX equipment in the PRA used to support this LAR, and provide updated risk results (i.e., LAR Attachment 2) that does not credit FLEX equipment and actions.

Question Number: 131

RG 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," provides risk acceptance criteria. in terms of the change in risk in combination with either total core damage frequency or large early release frequency.

RG 1.174 and Section 6.4 of NUREG 1855, Revision 1, for a Capability Category II risk evaluation, indicate that the mean values of the risk metrics (total and incremental values) need to be compared with risk acceptance guidelines. The mean values referred to are the means of the probability distributions that result from the propagation of the uncertainties on the PRA input parameters and model uncertainties explicitly reelected in the PRA models. In general, the point estimate CDF and LERF obtained by quantification of the cutset probabilities using mean values for each basic event probability does not produce a true mean of the CDF/LERF. Under certain circumstances, a formal propagation of uncertainty may not be required if it can be demonstrated that the state-of-knowledge correlation (SOKC) is unimportant (i.e., the risk results are well below the acceptance guidelines).

Section 8 of NEI 00-04, "10 CFR 50.69 SSC Categorization Guideline," requires a cumulative sensitivity study to evaluate the potential impact on CDF and LERF based on a postulated reduction in reliability due to the special treatment of selected SSCs. The guidance states that the results of this study should be compared to the risk acceptance guidelines of RG 1.174 as a measure of acceptability.

LAR Attachment 2 presents estimates of the total CDF and LERF based on the internal events (including flooding) and fire risk. NRC staff notes that for FNP, the total CDF of $8.4E-05$ per year begins to approach the RG 1.174, Revision 3, threshold of $1E-04$ per year for total CDF without considering the risk increase due to SOKC.

Please address the following:

- (a) Demonstrate that FNP's total CDF and LERF mean values meet the RG 1.174 risk acceptance guidelines.
- (b) As an alternative to Part (a), provide justification that the FNP risk values represent an acceptable level of risk to public safety.
- (c) Clarify, with regards to the NEI 00-04 Section 8 sensitivity study, that the FNP calculation will use the mean risk values of each PRA modeled hazard group. Include in this discussion what steps FNP will perform in the case the sensitivity results exceed the RG 1.174 acceptance guidelines.
- (d) Alternatively to Part (c), propose a mechanism that ensures the NEI 00-04 Section 8 cumulative sensitivity study results is in conformance with the RG 1.174 risk acceptance guidelines when the internal events, internal flooding, and fire PRA mean values are used in the study.