

**From:** Lamb, John  
**Sent:** Friday, May 20, 2022 9:08 AM  
**To:** Quarles, Adam Graham  
**Cc:** Joyce, Ryan M.; Enfinger, Timothy Lee  
**Subject:** RAIs - Hatch, Units 1 and 2, TSTF-505 LAR (EPID: L-2021-LLA-0199)

**Importance:** High

Adam,

By letter dated October 26, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21300A153), Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) for Edwin I. Hatch Nuclear Plant (Hatch), Units 1 and 2.

The proposed amendment would revise technical specification (TS) requirements to permit the use of risk-informed completion times (RICTs) for actions to be taken when limiting conditions for operation (LCOs) are not met. The proposed changes are based on Technical Specifications Task Force (TSTF) Traveler TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b," dated July 2, 2018 (ADAMS Accession No. ML18183A493). The U.S. Nuclear Regulatory Commission (NRC) issued a final model safety evaluation (SE) approving TSTF 505, Revision 2, on November 21, 2018 (ADAMS Accession No. ML18269A041).

After reviewing the LAR, the NRC staff requests response to the request for additional information (RAI) given below.

On April 13, 2022, the NRC staff provided draft RAI questions to SNC to make sure that the RAIs are understandable, the regulatory basis is clear, to ensure there is no proprietary information, and to determine if the information was previously docketed. On May 20, 2022, a clarifying call was held and SNC stated that it would provide the RAI response within 90 days of the date of this email.

If you have any questions, you can contact me at 301-415-3100.

Sincerely,

John

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### **REQUEST FOR ADDITIONAL INFORMATION (RAI)**

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After reviewing the LAR, the NRC staff requests response to the request for additional information (RAI) given below.

## **Probabilistic Risk Assessment Licensing Branch C (APLC) RAI Questions**

### **APLC-RAI-1 - Impact of Portable FLEX Equipment on Seismic Penalty**

The NRC memorandum dated May 30, 2017, "Assessment of the Nuclear Energy Institute [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 staff's assessment of challenges to incorporating FLEX equipment and strategies into a probabilistic risk assessment (PRA) model in support of risk-informed decision-making in accordance with the guidance of Regulatory Guide (RG) 1.200, Revision 2 (ADAMS Accession No. ML090410014). With regards to equipment failure probability, in the memorandum dated May 30, 2017, the NRC staff concludes (Conclusion 8):

"The uncertainty associated with failure rates of portable equipment should be considered in the PRA models consistent with the American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) PRA Standard as endorsed by RG 1.200. Risk-informed applications should address whether and how these uncertainties are evaluated."

With regards to human reliability analysis (HRA), NEI 16-06, "Crediting Mitigating Strategies in Risk-Informed Decision Making," dated August 26, 2016 (ADAMS Accession No. ML16286A297), Section 7.5 recognizes that the current HRA methods do not translate directly to human actions required for implementing mitigating strategies. Sections 7.5.4 and 7.5.5 of NEI 16-06 describe such actions to which the current HRA methods cannot be directly applied, such as debris removal, transportation of portable equipment, installation of equipment at a staging location, routing of cables and hoses; and those complex actions that require many steps over an extended period, multiple personnel and locations, evolving command and control, and extended time delays. In the memorandum dated May 30, 2017, the NRC staff concludes (Conclusion 11):

"Until gaps in the human reliability analysis methodologies are addressed by improved industry guidance, [Human Error Probabilities] HEPs associated with actions for which the existing approaches are not explicitly applicable, such as actions described in Sections 7.5.4 and 7.5.5 of NEI 16-06, along with assumptions and assessments, should be submitted to NRC for review."

Section 6 of Enclosure 2 to the LAR dated October 26, 2021, states that while Internal Events, Internal Flooding, and Fire PRA models credit only permanently installed FLEX equipment, portable FLEX equipment was credited in the Hatch Seismic PRA (SPRA) model. The Hatch SPRA is not directly used in the risk-informed completion time (RICT) program, but it is used to

provide selected input into the calculation of the seismic core damage frequency (SCDF) and seismic large early release frequency (SLERF) penalty. It is unclear to the NRC staff how much of an impact the portable FLEX equipment would have on the evaluation of the SCDF and SLERF penalties. During the regulatory audit (ADAMS Accession No. ML21309A000) held on April 5 – 7, 2022, the licensee provided information on a FLEX sensitivity study for Hatch, Unit 1, that set the failure rates for portable FLEX equipment at 0.1/year and appeared to demonstrate that the uncertainty associated with the portable FLEX equipment does not significantly impact the bounding seismic penalty values. However, no information on a sensitivity study for Hatch, Unit 2, was provided nor were the base failure rates for the portable FLEX equipment. This information is needed to determine the overall impact of this source of uncertainty for this application.

Therefore, provide information on sensitivity studies for Hatch, Units 1 and 2, that address the impact of the portable FLEX equipment credited in the Hatch SPRA on the calculated SCDF and SLERF penalty values. Include the portable FLEX failure rates in both the base and sensitivity cases.

### **APLC-RAI-2 - Tornado Missiles**

Section 2.3.1, Item 7, of NEI 06-09 (ADAMS Accession No. ML122860402) states that the “impact of other external events risk shall be addressed in the RMTS [risk-managed technical specifications] program,” and explains that one method to do this is by documenting, prior to the RMTS program, “that the external events that are not modeled in the PRA are not significant contributors to configuration risk.” The NRC staff’s safety evaluation for NEI 06-09 (ADAMS Accession No. ML071200238) states that “[o]ther external events are also treated quantitatively, unless it is demonstrated that these risk sources are insignificant contributors to configuration-specific risk.”

Table E4-4 of Enclosure 4 to the LAR dated October 26, 2021, indicates that the tornado-generated missile hazard is screened based on criteria “C1” (Event damage potential is < events for which plant is designed) of Table E4-5. Section 3 of Enclosure 4 to the LAR dated October 26, 2021, indicates that two nonconformances were identified, with one being corrected with a plant modification and the other, associated with service water systems, was evaluated and screened. However, the NRC staff reviewed a document, “Plant Hatch Tornado Missile Project Summary Report [SNC826314],” made available on the audit portal, which states that a Tornado Missile Risk Evaluation (TMRE) will need to be performed to conservatively estimate the risk of the remaining unprotected structures, systems, and components (SSCs) from tornado-generated missiles. The NRC staff notes that this risk appears to be related to beyond-design-basis events and that no TMRE documentation was provided in the application process. During the regulatory audit (ADAMS Accession No. ML21309A000) held on April 5 – 7, 2022, the licensee indicated that the TMRE has not been performed and that there are no current plans to perform the analysis since no non-conformances exist in the plant. The NRC staff notes that the LAR dated October 26, 2021, provides the ‘C1’ criterion (corresponding to the plant design basis) for screening tornadoes and associated missiles. However, the information provided in the LAR dated October 26, 2021, appears to address beyond-design-basis tornado missiles risk and the licensee indicated during the audit that it will further examine the screening criteria that will cover beyond-design-basis tornado missiles.

Therefore, provide updated screening criteria for the tornado missiles hazard at Hatch, Units 1 and 2. Include, in the response, justification if the screening criteria are sufficient and adequate for this hazard.



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