

**From:** Miller, Ed  
**Sent:** Monday, November 29, 2021 12:16 PM  
**To:** Yan.Gao@dominionenergy.com  
**Subject:** Draft RAI For Summer TSTF-425 LAR  
**Attachments:** Summer TSTF-425 Draft RAIs.docx

Yan,

Attached is the NRC staff's draft RAI for the subject request. The questions are being transmitted to you to determine 1) If the question clearly conveys the NRC information needs, 2) Whether the regulatory basis for the question is clear, and 3) If the information has already been provided in existing docketed correspondence. Additionally, review of the draft question will allow you to determine whether you are able to support a 30 day response time. After you've had a chance to review, please let me know if you would like to have a clarification call. Thank you.

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DRAFT REQUEST FOR ADDITIONAL INFORMATION REGARDING  
LICENSE AMENDMENT REQUEST TO  
RELOCATE SURVEILLANCE FREQUENCIES TO LICENSEE-CONTROLLED PROGRAM  
VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1  
DOCKET NO. 50-395, LICENSE NO. NPF-12  
EPID: L-2021-LLA-0064

By letter dated April 8, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21102A127), Dominion Energy South Carolina, (DESC), submitted a license amendment request (LAR) for the Virgil C. Summer Nuclear Station, Unit 1, (VCSNS), to relocate specific surveillance frequency requirements to a licensee-controlled program in accordance with Technical Specific Task Force Traveler 425, "Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b," (TSTF-425). The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the LAR and generated a draft request for additional information (RAI) in order to complete the review.

APLB RAI-01 - Open PRA Facts and Observations (F&O)

Regulatory Guide (RG) 1.200 "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment for Risk-Informed Activities," Revision 2, March 2009 (ADAMS Accession No. ML090410014), provides guidance for addressing probabilistic risk assessment (PRA) acceptability and describes the peer review process using the American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) PRA standard ASME/ANS-RA-Sa-2009, as one acceptable approach for determining the technical acceptability of the PRA. The primary results of peer reviews are the Facts and Observations (F&Os) recorded by the peer review team and the subsequent resolution of these F&Os.

- a) Attachment 2 of the LAR, "Documentation of PRA Acceptability," provides finding-level F&Os for internal events, internal flooding, fire, and seismic PRAs that remain open. The licensee stated that if a non-trivial impact is expected, then performance of additional sensitivity studies or PRA model changes to confirm the impact on the risk analysis will be included. Please clarify the process and criteria that will be used to determine what constitutes a non-trivial impact on surveillance test interval (STI) evaluations for open items. Please justify how the process and criteria is sufficient to determine the impact the open items can have on the STI evaluations.
- b) Seismic F&O 19-10 regarding assessment of internal events PRA (IEPRA) open findings overall impact on other PRA hazard models.

In Section 3.4.1 of Attachment 2 of the LAR, the licensee stated that sixty-five findings remain open and active against the IEPRA model. The seismic PRA (SPRA) peer review team noted that because of the broad nature of the findings (e.g., most high-level requirements (HLRs) have multiple open findings) that they were unable to assess the collective impact on the SPRA model. The NRC staff notes, since the IEPRA model provides the basis used for other hazard models, that this observation would apply to the

internal flooding and fire PRA (FPRA) models. Please clarify dependencies of other models on the SPRA.

- c) The licensee's disposition description states that, for forty-two open findings, each of the related issues will be evaluated in accordance with Steps 5 and 14 of the process detailed in NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b Risk-Informed Method for Control of Surveillance Frequencies," Revision 1, (ADAMS Accession No. ML071360456). Step 5 consists of identifying sources of PRA modeling uncertainty related to technical adequacy, and Step 14 is the performance of required supplemental sensitivity studies used to determine the impact of the uncertainty issue on STI evaluations. Please clarify how the accumulation of these items will be assessed during STI evaluations.
- i. Describe how the additional sensitivity studies related to the open internal events findings will be performed for the internal flooding, fire, and seismic PRA models for each open F&O issue.
  - ii. Explain the process that will be used to assess the cumulative impact of the multiple finding for each STI surveillance evaluation. Include clarification of whether the process will consist of multiple individual sensitivity studies or one cumulative study.
  - iii. If the process allows for the performance of multiple individual sensitivity studies rather than one cumulative study, then justify that the process adequately assesses the cumulative impact of the multiple issues in the STI evaluation.
- d) The licensee's disposition states that, for twelve open findings that appear to involve conservative modeling treatments, they will be evaluated in accordance with Steps 9 and 11 of the process detailed in NEI 04-10 when the issue is determined to fail to meet acceptance guidelines or does not provide meaningful results. The NRC staff notes Step 9 is intended to determine if an STI requires incorporation into the PRA model and Step 11 is to update the PRA model.
- i. Explain how this process will assess the cumulative impact of the twelve conservative treatments for each STI evaluation.
  - ii. Confirm that all PRA model updates will meet Capability Category (CC) – II requirements provided in the ASME/ANS 2009 PRA Standard.
  - iii. Confirm that all PRA model updates will be reviewed for PRA upgrades, as defined in the ASME/ANS 2009 PRA Standard, and will be subject to a focused-scope peer with the associated findings closed prior to performing STI evaluations.
- e) Section 4.2 of Attachment 2 of the LAR provides details for open FPRA findings. The disposition to FOID CF-A1-01, regarding Circuit Failure Mode Likelihood Analysis, states that FPRA model is not in complete alignment in resolving this issue since Volume 2 of NUREG-7150, Volume 2, "Joint Assessment of Cable Damage and Quantification of

Effects from Fire (JACQUE-FIRE), Expert Elicitation Exercise for Nuclear Power Plant Fire-Induced Electrical Circuit Failure,” May 2014 (ADAMS Accession No. ML14141A129), has only been partially implemented. The dispositions to FOIDs ES-B1-01, ES-B1-03, and PRM-B9-02, regarding data and mapping fidelity, state that the closure review team noted that anomalies still exist for these issues. The dispositions for all four findings state that these issues will be evaluated using Steps 5 and 14 of the NEI 04-10 process (e.g., sensitivity studies). Given these issues appear to be related to model completeness, please clarify how the sensitivity study process can address these model completeness issues. Identify PRA updates using NUREG-7150 guidance that remain to be implemented and the data fidelity issues that need to be addressed.

#### APLB RAI-02 - Open IEPRA Findings

RG 1.200 provides guidance for addressing PRA acceptability and describes a peer review process using the PRA standard ASME/ANS-RA-Sa-2009, as one acceptable approach for determining the technical acceptability of the PRA. The primary results of peer review are the F&Os recorded by the peer review team and the subsequent resolution of these F&Os. The following findings were dispositioned in the LAR as having no impact on the STI process, however, for the following F&Os, please clarify how these issues would not impact the program.

- a) F&O 06-19 regarding divergent path analysis. The disposition for this finding appears to refer to system component screening, which is the subject of the preceding F&O 06-18. Accordingly, the disposition provided for F&O 06-19 does not appear to apply to this finding. Clarify if the disposition to F&O 06-19 is correct for this issue or provide an updated disposition for this finding.
- b) F&O 02-06 regarding the documentation of assumptions, appears to be an open finding with no subsequent work performed. Step 5 of NEI 04-10 states that “identified sources of key uncertainty serve as inputs to identifying appropriate sensitivity cases in Step 14.” Please clarify if this issue has been addressed adequately
  - i. Provide clarification whether identification of key assumptions and sources related to this supporting requirement (SR) have been identified, sufficiently resolved, and documented for the STI process.
  - ii. If documentation of these assumptions has not been performed, then provide justification that the excluded sources of uncertainty will not impact STI evaluations.
- c) F&O 04-32 regarding the documentation of limitations of the large early release frequency (LERF) analysis in determining the impact on applications. Please clarify if LERF analysis limitations have been identified and analyzed properly for the STI process. If documentation of these limitations has not been performed, then provide justification that the excluded limitations does not impact STI evaluations.

### APLC RAI-01 – Use of Addendum B of the PRA Standard (2013)

Section 4 of RG 1.200, Revision 2, states that a risk informed submittal should contain discussions concerning peer reviews. If the peer review is not performed against the established standards, then information needs to be included in the submittal demonstrating that the different criteria used are consistent with the established standards, as endorsed by NRC.

Section 3.4.3 of Attachment 2 of the LAR states that the SPRA was peer reviewed against the requirements in the ASME/ANS PRA Standard (ASME/ANS RA-Sb-2013) for the seismic fragility analysis (SFR) element and seismic plant response (SPR) element. RG 1.200, Revision 2, endorses ASME/ANS PRA Standard Addendum A (ASME/ANS RA-Sa-2009). As noted in the NRC letter dated July 6, 2011, "U.S. Nuclear Regulatory Commission (NRC) Comments on "Addenda to a Current ANS: ASME RA-SB - 20XX, Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications" (ADAMS Accession No. ML111720067), the NRC did not endorse Addendum B of the PRA Standard. DESC's SPRA peer review for SFR and SPR elements was performed using a PRA Standard different from that endorsed by the NRC staff in RG 1.200, Revision 2.

The NRC staff requests that the licensee discuss how the SRs in Addendum B, which is not endorsed by the NRC for licensing applications, and the NRC staff's comments in the above cited letter dated July 6, 2011, are consistent with the SRs in Part 5 of Addendum A, for this LAR. If the different criteria are not consistent with the endorsed Standard, describe how the analogous Addendum A SRs have been met.

### APLC RAI-02 – Seismic PRA Open F&Os

Section 4.2 of RG 1.200 states that the LAR should include a discussion of the resolution of the peer review F&Os that are applicable to the parts of the PRA required for the LAR. This discussion should take the following forms:

- a discussion of how the PRA model has been changed, and
- a justification in the form of a sensitivity study that demonstrates the accident sequences or contributors significant to the application decision were not adversely impacted (remained the same) by the particular issue.

Section 4.3 of Attachment 2 of the LAR provides SPRA F&Os and SFCP Dispositions. There are four open F&Os discussed in this section.

FOID 19-10 is an open F&O that covers all unresolved IEPRA F&Os, which may or may not impact the SPRA. The licensee's SFCP disposition states that the issue will be reviewed and assessed on an evaluation-specific basis in accordance with NEI 04-10 process (Steps 5, 14) until this issue is considered resolved. The licensee neither provided a detailed evaluation how each IEPRA F&O has a potential impact on its SPRA model, nor evaluated the impacts on the SFCP.

- a) Provide a detailed evaluation of how each IEPRA F&O has a potential impact, or not, on the SPRA model. For those IEPRA F&Os with impacts on the SPRA, evaluate their impacts on the SFCP or justify why this F&O has no impact on the SFCP.

FOID 24-07 states that, "The liquefaction potential was not considered in the identification of failure modes that can affect the Service Water system."

- b) Provide justification that this issue would have small impact on the SFCP.

FOID 20-01 states that the PSHA [probabilistic seismic hazard analysis] for the VC Summer site was performed using the existing seismic source model described in NUREG-2115. NUREG-2115, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities," (ADAMS Accession No. ML12048A804), which is commonly used for the seismic hazard and screening reports in response to NRC request for information to 10 CFR 50.54(f) regarding recommendation 2.1 of the Near-term Task Force Review of insights from the Fukushima Dai-Ichi accident. The licensee neither provided information if the updated seismic source model is available for the VC Summer site to close this F&O, nor compared the existing seismic source model with the updated one if it is available.

- c) If the updated seismic source model is available, compare the existing one used in the SPRA with the updated one, and evaluate the impacts on the SFCP. Otherwise, describe how it would be closed by FOID 20-01 if the updated seismic source model is not available or is otherwise not supported by docketed information

#### APLC RAI-03 – Considerations of High Winds

NEI 04-10 states that external events risk impact may be considered quantitatively or qualitatively. The NRC staff's safety evaluation on NEI 04-10 (ADAMS Accession No. ML072570267) states that a qualitative screening analysis may be used when the surveillance frequency impact on plant risk can be shown to be negligible or zero.

Section 2.5 of Attachment 2 of the LAR states that the VCSNS hurricane, tornado and high winds analyses show that the plant is adequately designed, or procedures exist to cope with the effects of these natural events. However, the licensee did not provide supporting references to show that the high winds can be screened out from this LAR. Please clarify whether the licensee's high winds analyses continue to be appropriate for use in the proposed program and whether updated information about high winds will be used in the proposed program. Include a description of how recent high winds related information is included in the licensee's proposed program or justify its exclusion.

#### APLC RAI-04 – Considerations of External Flooding

NEI 04-10, states that external events risk impact may be considered quantitatively or qualitatively. The NRC staff's safety evaluation on NEI 04-10, states that a qualitative screening analysis may be used when the surveillance frequency impact on plant risk can be shown to be negligible or zero.

Section 2.5 of Attachment 2 of the LAR states, in part, that the licensee's IPEEE [Individual Plant Examination of External Events] process is capable of identifying the most likely severe accidents and severe accident vulnerabilities. The licensee did not provide any current evaluation on other external hazards, including external flooding. In the licensee's Flood Hazard Reevaluation Report (ADAMS Accession No. ML13073A114), the licensee determined that the local intense

precipitation (LIP) is not bounded by the current design basis. Please clarify whether the licensee's IPEEE information and evaluation for external flooding continues to be appropriate for use in the proposed program. Please clarify how the updated external flooding information for the site will be used in the proposed program.

The NRC staff requests that the licensee discuss how the IPEEE evaluation for external flooding continues to be appropriate for use in the proposed program given recent information on the external flooding hazard at the site. Include a description of how recent external flooding information for the site is included in the licensee's proposed program or justify its exclusion. Any information supporting the NRC staff's approval of this amendment needs to be submitted on the docket.