

**From:** Green, Kimberly  
**Sent:** Thursday, May 26, 2022 9:18 AM  
**To:** Taylor, Andrew Charles  
**Cc:** Buckberg, Perry; Victor, William Ross  
**Subject:** Request for Additional Information Related to Sequoyah Nuclear Plant's LAR to adopt TSTF-505 (EPID L-2021-LLA-0145)  
**Attachments:** SQN TSTF-505 RAI 5-26-2022 L-2021-LLA-0145.docx

Dear Mr. Taylor,

By letter dated August 5, 2021 (ADAMS Accession No. ML21217A174), as supplemented by letters dated April 28 and May 13, 2022 (ADAMS Accession Nos. ML22118A496 and ML22133A238, respectively), the Tennessee Valley Authority (TVA) submitted a license amendment request for the Sequoyah Nuclear Plant, Units 1 and 2, to adopt risk-informed completion times in accordance with Technical Specification Task Force (TSTF) Traveler TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b."

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing your submittal and has identified areas where additional information is needed to complete its review. A draft request for additional information (RAI) was previously transmitted to you by email dated May 20, 2022. At TVA's request, a clarification call was held on May 25, 2022, to clarify the NRC staff's draft RAI. As a result of the clarification call, the following phrase was added to the first sentence of Request b: "...as well as the fragility groups."

As agreed during the call, a response to the attached RAI is requested 45 days from the date of this email. Please note that as a result, the NRC staff may not be able to issue the amendments by the stated date of August 27, 2022. As this date approaches, the PM will advise you of a revised date, if necessary.

The NRC staff considers that timely responses to RAIs help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact Perry Buckberg at (301) 415-1383 or via email at [Perry.Buckberg@nrc.gov](mailto:Perry.Buckberg@nrc.gov).

On behalf of Perry Buckberg,  
Kimberly J. Green, Senior Project Manager  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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**From:** Green, Kimberly

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"Buckberg, Perry" <Perry.Buckberg@nrc.gov>  
Tracking Status: None  
"Victor, William Ross" <wrvictor@tva.gov>  
Tracking Status: None  
"Taylor, Andrew Charles" <actaylor@tva.gov>  
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REQUEST FOR ADDITIONAL INFORMATION  
REGARDING REQUEST TO ADOPT TSTF-505  
TENNESSEE VALLEY AUTHORITY  
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-327 and 50-328  
EPID-L-2021-LLA-0145

**Background**

On August 5, 2021, the Tennessee Valley Authority (the licensee) submitted a license amendment request (LAR) to revise technical specifications to adopt risk-informed completion times in accordance with TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b" (ADAMS Accession No. ML21217A174). As part of the NRC staff evaluation of this LAR, a virtual Regulatory Audit was conducted from September 2021 through March 2022 (ADAMS Accession No. ML22108A282). The LAR was supplemented on April 28, 2022 (ADAMS Accession No. ML22118A496), and May 13, 2022 (ADAMS Accession No. ML22133A238).

**Regulatory Basis**

Section 2.3 of Regulatory Guide (RG) 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (ADAMS Accession No. ML17317A256), describes acceptability of a probabilistic risk assessment (PRA). The PRA analysis used to support an application is measured in terms of its appropriateness with respect to scope, level of detail, conformance with the technical elements, and plant representation. RG 1.200, Revision 2 (ADAMS Accession No. ML090410014), provides detailed guidance on technical acceptability of a PRA used to support risk-informed applications.

**Request for Additional Information**

**APLC-RAI-1**

In its April 28, 2022, response to APLA Audit Question 07, the licensee explained that a revised state-of-knowledge correlation (SOKC) analysis is unnecessary because the point estimate values are within 2 percent of the calculated mean values from the current one top multi-hazard model (OTMHM) seismic PRA (SPRA) model. The licensee provided a comparison of seismic core damage frequency (SCDF) and seismic large early release frequency (SLERF) between the mean and point estimate values in the SPRA submittal made in its October 18, 2019, response to the NRC's post-Fukushima actions (ADAMS Accession No. ML19291A003) and current OTMHM SPRA. The results show that the mean and point estimate values are within 2 percent of each other in the OTMHM SPRA model, while these values are different by more than 2 times in the SPRA submittal in response to the NRC's post-Fukushima actions. The licensee explained that this substantial change was due to the correction of an error in the quantification of the SPRA stating that the "error was made by not correctly setting a single parameter used by the UNCERT computer code (@POINTCALC) in calculating mean values," and that the "error significantly affected how the mean values were calculated." However, the licensee did not provide any details on the error, the basis for its substantial impact on the quantification results, and why such an impact is expected due to correction of the error.

In addition, the NRC staff's review and discussion during the regulatory audit for the LAR appears to indicate that the OTMHHM model does not support uncertainty analysis. Further, in Section 5 of Enclosure 2 to the LAR, the licensee stated that the SQN SPRA Facts and Observations (F&O) Independent Assessment and Focused-Scope Peer Review was performed from February 4 - 8, 2019. Since the licensee submitted its SPRA in response to NRC's post-Fukushima actions on October 18, 2019, it appears that the change made to correct the quantification error was not part of the SPRA that was peer reviewed.

The NRC staff's experience reviewing SPRAs is that the SPRA mean values and point estimates are appreciably different, primarily due to the uncertainty in the hazard curve and, in certain cases, select fragilities. For example, Case numbers 18 and 19 in Table 5-7 of the licensee's October 18, 2019, response to the NRC's post-Fukushima actions demonstrates the large difference in SCDF and SLERF is due to the uncertainty in the seismic hazard. An additional example is a recent peer reviewed SPRA supporting a 10 CFR 50.69 application, which demonstrated that the uncertainty mean is about 30 percent higher than the point estimate for both SCDF and SLERF.

Based on above observations, please address the following:

- a) Provide an explanation of the error that was corrected which resulted in the changes to the mean and point estimate SCDF and SLERF values in the OTMHHM SPRA model compared to the SPRA submitted in response to the NRC's post-Fukushima actions. The explanation should discuss why, given the uncertainty in the seismic hazard, the correction of the error resulted in a large change in the mean value and why such a change is to be expected.
- b) Clarify whether the OTMHHM model supports quantification of parametric uncertainty for the seismic PRA, including the uncertainty in the seismic hazard curve as well as the fragility groups. If it does, explain the process for parametric uncertainty analysis, including the uncertainty in the seismic hazard curve, employed for the OTMHHM model compared to the SPRA submitted in response to the NRC's post-Fukushima actions. If it does not, provide an explanation of how the mean and point estimates can be compared using the OTMHHM SPRA model.
- c) Justify why the change does not constitute a PRA upgrade per the definition in the 2009 ASME/ANS PRA Standard, as endorsed in RG 1.200, Revision 2, and therefore, require a focused-scope peer review.