

## NRR-DMPSPeM Resource

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**From:** Schaaf, Robert  
**Sent:** Friday, March 8, 2019 3:00 PM  
**To:** Wells, Russell Douglas  
**Cc:** Hulvey, Kimberly Dawn; Edmondson, Carla; Brown, Michael Anthony; Shoop, Undine; Saba, Farideh  
**Subject:** Watts Bar Nuclear Plant - Final Request for Additional Information Related to Request to Adopt TSTF-425 to Relocate Specific Surveillance Frequency Requirements to Licensee-Controlled Program (EPID L-2018-LLA-0279)  
**Attachments:** Watts Bar TSTF-425 Final RAI Attachment for Transmittal L-2018-LLA-0279.pdf

Russ,

By letter dated October 12, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18288A352), the Tennessee Valley Authority (TVA) submitted a license amendment request for the Watts Bar Nuclear Plant (WBN), Units 1 and 2. The requested amendments would modify the WBN, Unit 1 and 2, Technical Specifications to adopt Technical Specification Task Force (TSTF) traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5b," (ADAMS Accession No. ML090850642).

The U.S. Nuclear Regulatory Commission (NRC) staff has determined that additional information, as described in the attached request for additional information (RAI), is required for the staff to complete its review of the subject request.

These RAIs were transmitted to TVA as draft on February 19, 2019. TVA requested a clarification teleconference regarding the draft RAIs, which was held on March 6, 2019. During the call, the staff agreed to a minor wording change to question RAI APLA-04. The staff has also decided to delete question RAI APLA-06, regarding modelling of test-caused transients and wear of equipment.

During the call, TVA requested a 60-day period from the date of issuance of the final RAIs to respond to this request, due to TVA resource considerations. The staff has subsequently determined that the requested response time period is acceptable. Therefore, please provide TVA's responses to the attached RAIs within 60-days of the date of this transmittal in order to enable the staff to complete its review in accordance with TVA's requested schedule. Please call me at 301-415-6020 if you have any additional questions regarding this request for information.

Regards,

*Robert G. Schaaf*

Senior Project Manager

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**Sent Date:** 3/8/2019 2:59:53 PM

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REQUESTS FOR ADDITIONAL INFORMATION REGARDING RISK-INFORMED  
JUSTIFICATION FOR THE RELOCATION OF SPECIFIC SURVEILLANCE FREQUENCY  
REQUIREMENTS TO A LICENSEE CONTROLLED PROGRAM  
TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT – UNITS 1 & 2  
FACILITY OPERATING LICENSE NO. NPF-90 AND NPF-96

By letter dated October 12, 2018 (ADAMS Accession No. ML18288A352), Tennessee Valley Authority (TVA), submitted a license amendment request (LAR) regarding Watts Bar Nuclear Plant, Units 1 and 2. The proposed amendment would modify the Watts Bar TS by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of NEI 04-10. The licensee states that the proposed changes are consistent with Nuclear Regulatory Commission (NRC) approved industry/Technical Specification Task Force (TSTF) Standard Technical Specifications (STS) change TSTF-425, Revision 3 (ADAMS Accession No. ML090850642).

#### **REGULATORY BASES AND GUIDANCE**

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.36(c)(3), requires, in part, that Technical Specifications (TSs) include surveillance requirements. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

Nuclear Energy Institute (NEI) guidance document NEI 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies" (ADAMS Accession No. ML071360456), provides guidance for relocating the surveillance frequencies from the TSs to a licensee-controlled program by providing an NRC-approved methodology for control of the surveillance frequencies. The guidance in NEI 04-10, Revision 1, is acceptable for referencing in licensing actions to the extent specified and under the limitations delineated in NEI 04-10, and the NRC safety evaluation providing the basis for NRC acceptance of NEI 04-10 (ADAMS Accession No. ML072570267).

NEI 04-10 Step 5, "RG 1.200 PRA Technical Adequacy," requires the probabilistic risk assessment (PRA) to be of sufficient technical capability and be subjected to a peer review process assessed against a standard or set of acceptance criteria that is endorsed by NRC Regulatory Guide (RG) 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" (ADAMS Accession No. ML090410014).

NEI 04-10 Step 5 also states that “plants implementing TSTF-425 shall evaluate their PRAs in accordance with” RG 1.200. Further, it is stated that the RG specifically addresses the need to evaluate important assumptions that relate to key modeling uncertainties and the “identified key sources of uncertainty serve as inputs to identifying appropriate sensitivity cases in [NEI 04-10] Step 14.”

NEI 04-10 Step 5 ALSO discusses how RG 1.200 provides attributes of importance for risk determinations relative to external events, seismic, internal fires, and shutdown. The RG specifically addresses the need to evaluate important assumptions that relate to key modeling uncertainties and the need to evaluate parameter uncertainties and demonstrate that calculated risk metrics (e.g., CDF and LERF) represent mean values.

NEI 04-10 Step 8, “Associated STI [Surveillance Test Interval] SSC [structures, systems, and components] Modeled in PRA,” discusses considerations for SSCs that are not evaluated in the seismic PRA.

NEI 04-10 Step 14, “Perform Sensitivity Studies” states that, “Additional sensitivity cases should also be explored for particular areas of uncertainty associated with any of the significant contributors to the CDF and LERF results or if there are open Gap Analysis items when compared to the ASME Standard Capability Category II that would impact the results of the assessment.” Step 14 also calls for ensuring that there is not an “undue reliance on key assumptions and causes of uncertainty.”

RG 1.177 outlines the staff position in performing sensitivity and uncertainty analyses in support of surveillance frequency changes to technical specifications.

RG 1.200, Revision 2, Section 2.2, provides regulatory guidance regarding peer reviews and the staff regulatory position on NEI 00-02, “Probabilistic Risk Assessment (PRA) Peer Review Process Guidance” (ADAMS Accession No. ML061510619), NEI 05-04 “Process for Performing Follow-On [Internal Events] PRA Peer Reviews Using the American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) PRA Standard” (ADAMS Accession No. ML083430462), and NEI 07-12 “Fire Probabilistic Risk Assessment (FPRA) Peer Review Process Guidelines” (ADAMS Accession No. ML102230070).

RG 1.200, Revision 2, Section 4, states that a risk informed submittal should contain discussions concerning peer review. 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.

## **REQUESTS FOR ADDITIONAL INFORMATION**

Attachment 2 Section 2 of the LAR states that the PRA models have been developed in accordance with the requirements of RG 1.200, Revision 2, subjected to peer review and the Facts and Observations (F&O) independent assessment process.

The following requests for additional information (RAIs) are needed to enable the staff to complete its review of the licensee's application:

#### **RAI APLA-01**

The finding (F&O 1-6) pertaining to supporting requirement DA-D3, located in Table 6, "Open IE With IF PRA Open F&Os" of Attachment 2 of the LAR, observes that TVA did not enter uncertainty interval data into the CAFTA databases with proper distribution parameters. TVA stated that point estimates were used, and that missing uncertainty information would not impact the results. However, NEI-04-10 Step 14, "Perform Sensitivity Studies", requires that sensitivity analyses need to be performed as gap analyses for Common Cause Failure (CCF) to account for uncertainty. It is expected that other areas of uncertainty outside of the SSC in question can impact the result of its Surveillance Test Interval (STI) calculations. Therefore, the staff requests TVA to:

1. Discuss the methodology used to propagate uncertainty through the model and how the results of gap analyses will be integrated into the STI calculation.
2. The adoption of alpha factors for CCF was part of the changes made in Rev 2 of the model. Discuss the impact of the omission of uncertainty in STI calculations.

#### **RAI APLA-02**

The finding (F&O 2-18) pertaining to supporting requirements HR-D5, HR-G7, QU-C1, and QU-C2, located in Table 6, "Open IE With IF PRA Open F&Os" of Attachment 2 of the LAR, observed that the lower combined Human Error Probability (HEP) limit was not applied in the QRecover file. It is not clear if dependent multiple Human Failure Events (HFEs) exist which fall below the established threshold. It is noted in RG 1.177, "An Approach For Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications", Section A-2.3.4, "Parameters for Component Unavailability", that human errors following test or maintenance, if modeled, can contribute to the estimated component unavailability for technical specification changes. The staff therefore requests TVA to identify if there are any such dependent HFEs and to discuss their impact to the model and to the STI calculations.

#### **RAI APLA-03**

The finding (F&O 3-6) pertaining to supporting requirements QU-A3 and QU-E3, located in Table 6, "Open IE With IF PRA Open F&Os" of Attachment 2 of the LAR, require a State of Knowledge Correlation (SOKC) between event probabilities shall be applied. It appears that TVA discussed modeling uncertainty in the Uncertainty and Sensitivity notebook but, did not include parametric uncertainty as required. The staff requests TVA to provide a discussion on how parametric uncertainty through the SOKC will be applied for STI determinations impacting remaining in-service components.

#### **RAI APLA-04**

The finding (F&O 7-10) pertaining to supporting requirement IFQU-A6, located in Table 6, "Open IE With IF PRA Open F&Os" of Attachment 2 of the LAR, require that internal flood scenario-specific Performance Shaping Factors (PSFs) for Main Control Room (MCR) actions be revised in the assessment to account for potential changes to HEPs such as timing, stress, etc. The Electric Power Research Institute (EPRI) guidance states that PSFs do not have to be

revised for those events which require more than one hour available for operator action. There may be HFEs which would require less than an hour to either diagnose or perform. Therefore, the staff requests TVA to provide a tabulation and corresponding evaluation for those internal flood-related HFEs taking less than an hour for diagnosis and action, and their corresponding impact separately and, as a whole, to the STI evaluations.

#### **RAI APLA-05**

The finding (F&O 7-21) pertaining to supporting requirement IFEV-B3, located in Table 6, "Open IE With IF PRA Open F&Os" of Attachment 2 of the LAR, require that range factors related to parametric uncertainty data for flooding initiators be entered and propagated through the model for various pipe and break sizes. It had appeared that uncertainty data was lumped together for all pipe breaks and sizes and was not clear whether this was conservative. To ensure that there is no underestimate of risk, the staff requests TVA provide additional information on individual internal flood initiators and their associated error factors with their potential impact to the STI evaluations.

#### **RAI APLB-01 – Seismic PRA Peer Review Criteria**

Section 2 of the licensee's June 30, 2017, response (ADAMS Accession No. ML17181A485) to the 10 CFR 50.54(f) information request arising from Near Term Task Force (NTTF) recommendation 2.1 states that the seismic PRA peer review was performed in accordance with the guidance in NEI 12-13. NRC letter dated March 7, 2018, "U.S. Nuclear Regulatory Commission Acceptance of Nuclear Energy Institute (NEI) Guidance NEI 12-13, 'External Hazards PRA Peer Review Process Guidelines' (August 2012)," (ADAMS Accession No. ML18025C025), provides the staff comments on this guidance for seismic and external hazard PRA peer reviews. Further, the staff provided its expectations on the F&O independent assessment process in its letter dated May 1, 2017, "U.S. Nuclear Regulatory Commission Staff Expectations for an Industry Facts and Observations Independent Assessment Process," (ADAMS Accession No. ML17121A271).

The LAR does not discuss the consideration of the staff's comments on NEI 12-13 during the performance of the peer review for the licensee's seismic PRA or the consideration of the staff's expectations on the F&O independent assessment process used for closure of the seismic PRA finding level F&Os.

Discuss how the seismic PRA peer review and the F&O independent assessment considered the staff's comments in the letters dated March 7, 2018, and May 1, 2017, respectively. Provide justification for not considering specific comments in those letters in the context of this application.

#### **RAI APLB-02 – Use of Addendum B of the PRA Standard (2013)**

Section 2.5.1 of Attachment 2 to the LAR states that the seismic PRA was peer reviewed against the requirements in Part 5 of Addendum B of the ASME/ANS PRA Standard (ASME/ANS RA-Sb-2013). RG 1.200, Revision 2, endorses ASME/ANS PRA Standard Addendum A (ASME/ANS RA-Sa-2009). As noted in 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), NRC did not endorse Addendum B of the PRA Standard. The licensee's seismic PRA peer review was performed using a PRA Standard different from that endorsed by the NRC staff in RG 1.200, Revision 2.

Discuss how the supporting requirements (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 application. If the different criteria are not consistent with the endorsed Standard, describe how the analogous Addendum A supporting requirements have been met.

### **RAI APLB-03 – Key Assumptions and Uncertainties that could Impact the Application**

Section 2.5.5 of Attachment 2 to the LAR states that “[t]he TVA Technical Instruction governing the process requires key assumptions and key modeling uncertainties to be addressed to ascertain sensitivity of these on the proposed STI extensions and included in the documented evaluation for [Integrated Decision-making Panel] IDP consideration.” LAR Attachment 2 Section 2.5.5 states that there is a negligible to small impact of key assumptions and sources of uncertainty in the seismic PRA. It is unclear how the key assumptions and sources of uncertainty from the seismic PRA were identified, and were determined to have negligible to small impact on this application.

- a. Describe the approach used to identify and characterize the “key” assumptions and “key” sources of uncertainty in the licensee’s seismic PRA. The description should contain sufficient detail to identify: (1) whether all assumptions and sources of uncertainty related to all aspects of the hazard, fragility, and plant response analysis were evaluated to determine whether they were “key,” and (2) the criteria used to determine whether the modeling assumptions and sources of uncertainty were considered “key.”
- b. Discuss how each identified key assumption and key source of uncertainty was dispositioned for this application justifying the negligible to small impact on this application. Identify appropriate sensitivity cases that will be used to support the disposition for this application or use a qualitative discussion to justify why different reasonable alternative assumptions would not affect this application.

### **RAI APLB-04 – Consideration of Structures, Systems, and Components (SSCs) Not Evaluated in the Seismic PRA**

Section 4.3.6 of the licensee’s June 30, 2017, response (ADAMS Accession No. ML17181A485) to the 10 CFR 50.54(f) information request arising from NTTF recommendation 2.1 discusses the screening approach for SSCs during the development of the licensee’s seismic PRA. The supplement to that submittal (ADAMS Accession No. ML18100A966) also discusses the screening performed during the development of the seismic PRA and states that rugged SSCs were screened out. It is not clear in the LAR how SSCs not modeled explicitly or implicitly such as “inherently rugged” are considered in the surveillance frequency control program (SFCP).

Discuss how SSCs that are not evaluated in the seismic PRA, either explicitly or implicitly, will be considered in the SFCP. Examples of such SSCs include “inherently rugged” components and SSCs that were not included in the seismic PRA based on a screening criteria (e.g., capacity based screening), especially if the excluded components have surveillances associated with them (e.g., relief valves).

### **RAI APLB-05 – Incorporation of Diverse and Flexible Coping Strategies (FLEX) Equipment in Seismic PRA and Internal Events PRA**

The information presented in the licensee’s response to the 10 CFR 50.54(f) information request arising from NTTF recommendation 2.1 (ADAMS Accession No. ML17181A485) indicates that

Diverse and Flexible Coping Strategies (FLEX) diesel generators and other FLEX equipment, with associated operator actions, were credited in the licensee's seismic PRA.

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. The methodology used to assess the failure probabilities of FLEX equipment and how the human reliability analysis (HRA) was performed to model the corresponding human actions is unclear. Further, it is not clear how the FLEX equipment will be credited and treated in the licensee's proposed SFCP.

- a. Discuss the methodology used to assess the failure probabilities of FLEX equipment credited in both the licensee's internal events and seismic PRAs. The discussion should include a justification explaining the rationale for parameter values, whether the uncertainties associated with the parameter values are considered in accordance with the ASME/ANS PRA Standard as endorsed by RG 1.200, Revision 2, and how the staff's comments on NEI 16-06, "Crediting Mitigating Strategies in Risk-Informed Decision Making," in letter dated May 30, 2017 (ADAMS Accession No. ML17031A269) were appropriately considered.
- b. Discuss the HRA approach used to model FLEX actions including the consistency of the approach with the corresponding technical elements in the NRC endorsed ASME/ANS PRA Standard.
- c. Step 19, "Periodic Re-assessment" of NEI 04-10 states that "part of the periodic re-assessment also includes interfacing the SFCP with updates to the PRA model." Discuss the approach, including any existing or planned programmatic elements, which will be taken to ensure that the data assumptions for the FLEX equipment credited in the seismic PRA will continue to remain valid during the implementation of the licensee's SFCP.