From: Klett, Audrey
Sent: Wednesday, May 25, 2022 4:23 PM
To: Jurek, Shane
Subject: NRC Request for Additional Information - Susquehanna License Amendment Request (EPID L-2021-LLA-0062)
Attachments: NRC RAI for Susquehanna TSTF-505.docx

Shane,

In a letter dated April 8, 2021, Susquehanna Nuclear, LLC, (the licensee) requested amendments to the licenses for Susquehanna Steam Electric Station, Units 1 and 2. The licensee proposed changes to allow the use of risk-informed completion times for several technical specifications. The licensee submitted the proposal in accordance with an NRC-approved traveler prepared by the Technical Specifications Task Force (TSTF), TSTF-505, "Provide Risk-Informed Extended Completion Times." The licensee also proposed specific variations from TSTF-505 and changes not associated with the traveler. The licensee supplemented the request in a letter dated March 8, 2022.

The NRC staff needs additional information to complete its review of the license amendment request. Attached is the NRC staff's request for additional information (RAI).

As discussed with you via email on May 25, 2022, NRC is requesting the licensee to respond to the RAI on or by June 27, 2022.

Please let me know if you have any questions.

Audrey Klett, Senior Project Manager
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Operating Reactor Licensing
Plant Licensing Branch 1
301-415-0489

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Request for Additional Information
Susquehanna Steam Electric Station, Units 1 and 2
Docket Nos. 50-387 and 50-388
EPID No. L-2021-LLA-0062

In a letter dated April 8, 2021,[1] Susquehanna Nuclear, LLC, (the licensee) requested amendments to the licenses for Susquehanna Steam Electric Station, Units 1 and 2.[2] The licensee proposed changes to allow the use of risk-informed completion times (RICTs) for several technical specifications. The licensee submitted the proposal in accordance with an NRC--approved traveler prepared by the Technical Specifications Task Force (TSTF), TSTF-505, "Provide Risk-Informed Extended Completion Times."[3] The licensee also proposed specific variations from TSTF-505 and changes not associated with the traveler. The licensee supplemented the request in a letter dated March 8, 2022.[4]

The NRC staff needs the following additional information to complete its review of the license amendment request (LAR).

Failure Rates for Equipment Used in Diverse and Flexible Coping Strategies (FLEX)

Appendix A to RG 1.177, "Considerations and Data Needs for Technical Specification Change Risk Evaluations," includes explicit guidance:

> A request for plant-specific TS changes should use plant-specific data and not rely solely on generic data or data from similar plant designs.... [P]lant-specific data are expected to be available. For the components or systems for which TS changes are being considered, plant-specific data should be evaluated, and assurance should be obtained that these data are consistent with the plant experience. The licensee should justify the use of other than plant-specific data.

In May 2021, one of Susquehanna's three FLEX combustion turbine generators experienced a catastrophic failure. In addition, the NRC staff has identified other industry failure data suggesting that FLEX equipment failure rates may be significantly higher than the failure rates used in the baseline PRA models that support the Susquehanna RICT program.[5] These data suggest that the results of the sensitivity study to address modeling uncertainty (discussed during the audit and reported in the LAR supplement) may not be conservative enough to bound FLEX equipment failure rates. Changing these failure rates may affect calculated RICTs, particularly for TS 3.8.1, Condition C.

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1 PLA-7897, Accession No. ML21098A206 in the Agencywide Documents Access and Management System (ADAMS)
2 Renewed Facility Operating License Nos. NPF-14 and NPF-22, respectively
3 All references to TSTF-505 in this document are to Revision 2, dated July 2, 2018 (ML18183A493)
4 PLA-7984 (ML22067A171)
5 The Pressurized Water Reactor Owners Group (PWROG) recently updated FLEX equipment failure rate estimates, which it published in the report PWROG-18042-NP, Revision 1, "FLEX Equipment Data Collection and Analysis," dated February 2022 (ML22123A259). The PWROG reported failure rates for three of the four FLEX equipment failure modes that are higher than the failures rates that the licensee reported in its sensitivity study.

In the Susquehanna PRA models, the base case failure rates used for the Turbine Marine diesel generators and pumper truck diesel-driven pumps were assumed to be twice as large as the failure rates for similar equipment that is permanently installed. In response to audit question No. 6, the LAR supplement provided the results of a sensitivity study in which the licensee applied a factor of five increase to the base case failure probabilities of FLEX equipment. These results showed a minimal impact on the RICTs for LCO conditions most likely to be affected by FLEX equipment failures.

The LAR supplement states that aligning two of the three Turbine Marine generators is credited in the PRA models, but it is not clear to the staff how the licensee credited the third generator in its PRA models. The publicly available NRC memorandum from M. Reisi-Fard to J. Giitter dated May 30, 2017, states:

> The NRC staff does not agree with crediting spare portable equipment not modeled in the PRA in lieu of using appropriate failure rates, because this approach is not consistent with the . . . PRA Standard [ASME/ANS RA-Sa–2009] and RG 1.200. Furthermore, the potential impact of underestimating failure rates could be larger than the unquantified risk benefits of spare equipment not modeled in PRAs.[6] [Conclusion 5]

Also:

> The failure rates of permanently installed equipment cannot be used for portable equipment even if sensitivity analyses are performed. Licensees should use plant-specific o[r] generic data collected and analyzed using acceptable approaches to estimate the failure rates for portable equipment. [Conclusion 6]

The NRC has recently updated that memorandum to reflect current information.[7] The conclusions in the memorandum dated May 30, 2017, have not changed.

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6 Memorandum from M. Reisi-Fard to J. Giitter dated May 30, 2017 (ML17031A269)
7 Memorandum from A. Zoulis to M. Franovich dated May 6, 2022 (ML22014A084)

Request for Additional Information

RAI-1

Explain how the PRA models will address portable equipment failures as they occur (generic and plant-specific) to update estimates of FLEX equipment failure probabilities credited in the PRA models.

RAI-2

Describe LCO-specific sensitivity studies that assess the impact on the RICTs from the uncertainty associated with FLEX equipment failure probabilities. Provide the results of those studies. Explain how the studies bound generic failure data for portable equipment.

If the response does not show that the uncertainty associated with FLEX equipment failure probabilities has minimal impact on the RICT calculations, then:

A. Explain how the licensee would treat this key source of uncertainty in the RICT program.

B. Discuss specific risk management actions (RMAs) being proposed to address this key source of uncertainty, and explain how these RMAs are expected to reduce the risk associated with this source of uncertainty.