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June 27, 2022

Attn: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

10 CFR 50.90

SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUESTING ADOPTION OF TSTF-505, REVISION 2
PLA-8013

Docket No. 50-387 and 50-388

References:

1) *Susquehanna letter to NRC, "Proposed Amendment to Licenses NPF-14 and NPF-22: License Amendment Request to Revise Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 2, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b' (PLA-7897)," dated April 8, 2021 (ADAMS Accession No. ML21098A206).*

2) *NRC letter to Susquehanna, "Regulatory Audit Plan in Support of License Amendment Request to Revise Technical Specifications to Adopt Risk-Informed Completion Times (EPID L-2021-LLA-0062)," dated June 15, 2021 (ADAMS Accession No. ML21153A137).*

3) *Susquehanna letter to NRC, "Supplement to License Amendment Requesting Adoption of TSTF-505, Revision 2 (PLA-7984)," dated March 8, 2022 (ADAMS Accession No. ML22067A171).*

4) *NRC email to Susquehanna, "NRC Request for Additional Information – Susquehanna License Amendment Request (EPID L-2021-LLA-0062)," dated May 25, 2022 (ADAMS Accession No. ML22146A074).*

Pursuant to 10 CFR 50.90, Susquehanna Nuclear, LLC (Susquehanna), submitted, in Reference 1, a request for an amendment to the Technical Specifications (TS) for the Susquehanna Steam Electric Station (SSES), Units 1 and 2, Facility Operating License numbers NPF-14 and NPF-22. The proposed amendment would modify TS requirements to permit the

use of Risk Informed Completion Times in accordance with Technical Specifications Task Force (TSTF) Traveler TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times, RITSTF Initiative 4b."

The NRC notified Susquehanna in Reference 2 of the intent to conduct a regulatory audit virtually. During the virtual audit, Susquehanna personnel and associated contractors met with members of the NRC staff to discuss specific questions provided by the NRC staff. Following completion of the audit, Susquehanna provided supplemental information pertaining to the application in Reference 3. Subsequently, the NRC provided a Request for Additional Information (RAI) in Reference 4. Enclosure 1 provides Susquehanna's response to the RAI.

Susquehanna has reviewed the information supporting a finding of No Significant Hazards Consideration and the Environmental Consideration provided to the NRC in Reference 1 and determined the information provided herein does not impact the original conclusions in Reference 1.

There are no new or revised regulatory commitments contained in this submittal.

Should you have any questions regarding this submittal, please contact Ms. Melisa Krick, Manager – Nuclear Regulatory Affairs, at (570) 542-1818.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 27, 2022.

K. Cimorelli

Enclosures:
1. Response to Request for Additional Information

Copy: NRC Region I
Mr. C. Highley, NRC Senior Resident Inspector
Ms. A. Klett, NRC Project Manager
Mr. M. Shields, PA DEP/BRP

Enclosure 1 to PLA-8013

Response to Request for Additional Information

Response to Request for Additional Information

On April 8, 2021, Susquehanna Nuclear, LLC (Susquehanna), submitted a license amendment request for the Susquehanna Steam Electric Station (SSES), Units 1 and 2 (Reference 1). Specifically, Susquehanna requested a revision to the Technical Specifications (TS) to permit the use of Risk Informed Completion Times (RICTs) in accordance with Technical Specifications Task Force (TSTF) Traveler TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times, RITSTF Initiative 4b." By letter dated June 15, 2021, the NRC informed Susquehanna of the intent to conduct a regulatory audit virtually (Reference 2). During the virtual audit, Susquehanna personnel and associated contractors met with members of the NRC staff to discuss specific questions provided by the NRC staff. Following completion of the audit, Susquehanna provided supplemental information pertaining to the application in Reference 3. Subsequently, the NRC provided a Request for Additional Information (RAI) in Reference 4. The response to this RAI is provided below.

RAI-1

Explain how the [Probabilistic Risk Assessment] PRA models will address portable equipment failures as they occur (generic and plant-specific) to update estimates of [Diverse and Flexible Coping Strategies] FLEX equipment failure probabilities credited in the PRA models.

Susquehanna Response

The risk management process outlined in Susquehanna Procedure NFP-QA-201 (Reference 5) ensures that the applicable PRA models used for the RICT Program reflect the as-operated, as-built plant for the SSES, Units 1 and 2. The PRA configuration control process is consistent with the American Society of Mechanical Engineers (ASME) / American Nuclear Society (ANS) PRA Standard (Reference 6) and delineates the responsibilities and guidelines for updating the full power internal events PRA model and includes both periodic and unscheduled PRA model updates. The process is also applicable to all other Susquehanna PRA models, including the internal flooding and fire PRA models.

The process includes provisions for monitoring potential impact areas affecting the technical elements of the PRA models (e.g., due to plant changes, plant/industry operational experience, or errors or limitations identified in the model), assessing the risk impact of unincorporated changes and controlling the model and necessary computer files, including those associated with the Real Time Risk Model used in the RICT Program.

Plant changes are reviewed in accordance with NFP-QA-201 and the impact to the PRA model is determined, including consideration of the cumulative impact of other pending changes. Any

plant changes that meet the criteria specified in NFP-QA-201 for an unscheduled PRA model update are incorporated in the applicable PRA model(s). Otherwise, the change is assigned a priority and is incorporated at a subsequent periodic update consistent with procedural requirements. PRA updates for plant changes will be performed at least once every two refueling cycles following procedure NFP-QA-201 consistent with the guidance of NEI 06-09-A (Reference 7).

Based on the process identified above, when new industry data sources are identified as being available, a Risk Model Impact Evaluation (RMIE) is created so that it can be evaluated and prioritized as necessary. The RMIEs are addressed and PRA model updates, as necessary, are performed in accordance with station processes. For example, the Pressurized Water Reactor Owners Group (PWROG) published data, including calculated failure rates, for FLEX components in February 2022 (Reference 8). The calculated failure rates therein are not included in the Susquehanna PRA models described in References 1 and 3 due to the timing of release. An RMIE was generated to track this new industry data and has been assessed and determined to not require an unscheduled PRA update. This PWROG data (or any subsequently available generic data for FLEX components) will be reviewed and considered for inclusion in the next periodic update and any plant-specific experience will also be factored into the model using Bayesian analysis techniques for any risk-significant components as required by the ASME/ANS PRA Standard.

RAI-2

Describe [Limiting Condition for Operation] 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.

Susquehanna Response

Sensitivity cases were performed, as described in Reference 3, to assess the impact of uncertainty associated with FLEX equipment failure probabilities on calculated RICTs using a 5x multiplier. Following publication of the PWROG data in Reference 8, these sensitivity

studies were re-performed using the failure rates for the SSES credited portable FLEX equipment, Turbine Marine Generators and Fire Protection Pumper Truck, as shown below in Table 1.

To bound the available generic failure data, the Failure to Start (FTS) and Failure to Run (FTR) values are taken directly from the data in Table 6-1 of Reference 8. The values for the Turbine Marine Generators are based on the portable combustion turbine generator (CTG) data, and the values for the Fire Protection Pumper Truck are based on the portable diesel driven pump (DDP) data in Reference 8. The FTR data in the sensitivity cases conservatively use a full 24-hour mission time and is represented with a "mission time, no repair" equation of 1-EXP(-FTR*TIME) which is appropriate for a high-valued FTR event (rather than simply multiplying by the mission time). Until additional industry guidance or newer data are available, the FLEX component failure data should continue to be treated as a potential source of model uncertainty in applications.

Table 1
FLEX Equipment Type Codes

Type Code	Description	Basis	Failure Rate
DGT[1]	Start and Run Failure Rate for FLEX 4160 V Turbine Marine Generators	CTG [FTS] + CTG [1-EXP(-FTR * 24)] = 3.30E-02 + [1-EXP(-1.86E-02 * 24)] = 3.30E-02 + 3.60E-01 = 3.93E-01	0.393
PTT [2]	Start and Run Failure Rate for Fire Protection Pumper Truck	DDP [FTS] + DDP [1-EXP(-FTR * 24)] = 3.38E-02 + [1-EXP(-1.55E-02 * 24)] = 3.38E-02 + 3.11E-01 = 3.44E-01	0.344

Table 1 notes:
1. Start and run failure rate for Turbine Marine Generators.
2. Start and run failure rate for Fire Protection Pumper Truck.

To account for this source of model uncertainty, the same set of LCO Conditions that were previously analyzed in Reference 3 were selected to explore a range of cases that might be susceptible to the FLEX portable equipment reliability values. This included High Pressure Coolant Injection (HPCI) System, the combination of one Automatic Depressurization System (ADS) valve and one Core Spray (CS) Loop, Residual Heat Removal (RHR) suppression pool cooling, one Emergency Service Water (ESW) pump in each subsystem, one offsite AC power circuit, one diesel generator (DG), two offsite AC power circuits, and the combination of one offsite circuit and a DG. The results of the revised sensitivity studies are summarized in Table 2.

Table 2
FLEX Equipment Reliability Sensitivity RICT Estimate Results

TS	Condition	Base Model RICT Estimate (days)	Sensitivity RICT Estimate (days)	Percent Change for Total CDF	Percent Change for Total LERF
3.5.1.D	HPCI System inoperable	30	30 [1]	4.5%	~0.0%
3.5.1.G	One ADS valve and Condition A (i.e., one CS loop)	10.2	10.2	1.0%	~0.0%
3.6.2.3.A	One RHR suppression pool cooling subsystem inoperable	30	30 [1]	5.5%	~0.0%
3.7.2.A	One ESW Pump in each subsystem	3.7	3.6	5.0%	1.4%
3.8.1.A	One offsite AC power circuit inoperable	30	30 [1]	8.2%	0.7%
3.8.1.B	One DG inoperable	30	30 [1]	13.7%	~0.0%
3.8.1.C	Two or more offsite AC power circuits inoperable	6.8	5.2	21.9%	4.6%
3.8.1.D	One offsite AC power circuit AND one DG inoperable	30	30 [1]	13.5%	~0.0%

Table 2 note:

1. The change in CDF and LERF did not lead to a RICT value below the 30-day backstop.

As can be seen in Table 2, the RICTs are, in general, minimally impacted by the assumed FLEX equipment reliability values even when bounding failure rates are explored. Most cases resulted in less than a ten percent change in the total CDF and LERF values and either no or very small change to the calculated RICT values. Two cases were slightly above ten percent (i.e., LCO 3.8.1, Conditions B and D) but both of these cases were above the backstop RICT value of 30 days. Due to the impact on calculated RICTs for LCO 3.8.1, Condition C, RMAs will be considered when this Condition is entered to account for this source of uncertainty in the RICT Program.

The RMAs considered in the RICT Program are beyond normal schedule changes and RMAs otherwise implemented in accordance with station procedures. These RMAs are also beyond establishing protected equipment in accordance with the protected equipment program, which would include protection of all operable DGs whenever an offsite AC power source is out of service. Protection of equipment will help to improve the likelihood they are available if needed and thereby reduce the potential need to deploy the FLEX equipment. The RMAs that will be considered for LCO 3.8.1, Condition C, are listed below:

- Establish a compensatory action, shift brief, or standing instruction that focuses on actions operators will take in response to an initiating event and failure of structures, systems, or components susceptible to failure by common cause.

- Identify the fire risk areas, brief operations, and notify the Fire Marshall on the fire zones of elevated risk, and inform appropriate work groups of areas of elevated fire risk before scheduled maintenance configuration.

- Perform walk downs of key safety systems including portable equipment before and during the work activity.

The RMAs will reduce the risk associated with the uncertainty of the FLEX reliability data by:

- Heightened awareness of important operator actions will help to reduce the human error probability for those actions.

- Identification of high risk fire areas will help to reduce the risk of initiating events and loss of risk significant components caused by fires in those areas.

- Walk downs of key safety systems will help to ensure that the equipment is in its expected configuration and thereby reduce the unreliability values of those systems.

References

1. Susquehanna letter to NRC, "Proposed Amendment to Licenses NPF-14 and NPF-22: License Amendment Request to Revise Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 2, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b' (PLA-7897)," dated April 8, 2021 (ADAMS Accession No. ML21098A206).

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4. NRC email to Susquehanna, "NRC Request for Additional Information – Susquehanna License Amendment Request (EPID L-2021-LLA-0062)," dated May 25, 2022 (ADAMS Accession No. ML22146A074).

5. Susquehanna Procedure NFP-QA-201, "Internal Events At Power PRA Model Update and Configuration Control Process."

6. ASME/ANS Standard RA-Sa-2009, "Addenda to ASME/ANS RA-S-2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated February 2009.

7. NEI Topical Report NEI 06-09, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," Revision 0-A, dated October 12, 2012 (ADAMS Accession No. ML12286A322).

8. PWROG Topical Report PWROG-18042-NP, "FLEX Equipment Data Collection and Analysis," Revision 1, dated February 2022 (ADAMS Accession No. ML22123A259).