UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 19, 2023

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2 - AUTHORIZATION AND SAFETY EVALUATION FOR ALTERNATIVE REQUEST FOR VALVE 251130 (EPID L-2023-LLR-0045)

LICENSEE INFORMATION

Recipient's Name and Address: Mr. Edward Casulli
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Licensee: Susquehanna Nuclear, LLC

Plant Name and Unit: Susquehanna Steam Electric Station (Susquehanna), Unit 2

Docket No.: 50-388

APPLICATION INFORMATION

Submittal Date: August 14, 2023

Submittal Agencywide Documents Access and Management System (ADAMS) Accession No.: ML23226A212

Applicable Inservice Testing (IST) Program Interval and Interval Start/End Dates: Fourth 10-Year Interval Inservice Testing Program (June 1, 2014, to May 31, 2024)

Alternative Provision: The licensee requested an alternative under Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 55a, paragraph (z)(2), that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The licensee also included a discussion of the proposed alternative under 10 CFR 50.55a(z)(1) that the proposed alternative would provide an acceptable level of quality and safety, but the U.S. Nuclear Regulatory Commission (NRC) staff considered the provisions in 10 CFR 50.55a(z)(2) to be appropriate.

IST Requirement: American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), 2004 Edition through the 2006 Addenda, Subsection ISTC, "Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants," paragraph ISTC-3630, "Leakage Rate for Other Than Containment Isolation Valves," states:

> Category A valves with a leakage requirement not based on an Owner's 10 CFR 50, Appendix J program, shall be tested to verify their seat leakages within acceptable limits. Valve closure before seat leakage testing shall be by using the valve operator with no additional closing force applied.

ASME OM Code, Subsection ISTC, paragraph ISTC-3630(a), “Frequency,” states, “Tests shall be conducted at least once every 2 years.”

Applicable Code Edition and Addenda: ASME OM Code, 2004 Edition through 2006 Addenda, as incorporated by reference in 10 CFR 50.55a.

Brief Description of the Proposed Alternative: The licensee proposed an alternative to ASME OM Code pressure isolation valve leak test frequency requirements for the Susquehanna, Unit 2, residual heat removal (RHR) cross-connect check valve 251130.

The licensee is required to test RHR cross-connect check valve 251130 on a 2-year frequency, consistent with technical specification surveillance requirement 3.4.5.1 and ASME OM Code, Subsection ISTC, paragraph ISTC-3630, as incorporated by reference in 10 CFR 50.55a. The licensee stated in its request that it erroneously missed testing the valve during the 2023 Susquehanna, Unit 2, refueling outage (RFO). The licensee references the 25 percent grace allowance specified in technical specification surveillance requirement 3.0.2 when indicating that the test missed in the 2023 RFO will be due by October 9, 2023, unless the NRC staff authorizes the alternative.

The next RFO for Susquehanna, Unit 2, is currently scheduled for spring 2025, and there are no scheduled shutdowns meeting the parameters of the test prior to the expiration of the surveillance on October 9, 2023. The licensee’s submittal stated that performing a mid-cycle outage that meets the testing prerequisites (e.g., cold shutdown with reactor head removed and alternative means of decay heat available) would result in unnecessary plant movement and personnel dose exposure to perform the surveillance.

Similar to its request in letter dated August 3, 2023 (ML23215A173), for the Fifth 10-Year Interval IST Program that will commence on June 1, 2024, the licensee proposed to perform leak rate testing of RHR cross-connect check valve 251130 at intervals ranging from every RFO to every third RFO depending on the valve’s performance as an alternative to testing the valve during every 24-month RFO.

The licensee’s submittal at ML23226A212 has additional details.

STAFF EVALUATION

ASME OM Code, Subsection ISTC, paragraph ISTC-3630, as incorporated by reference in 10 CFR 50.55a, requires that OM Category A valves other than containment isolation valves (CIVs) shall be tested for seat leakage every 2 years. ASME OM Code Case OMN-20, “Inservice Test Frequency,” as accepted in Regulatory Guide 1.192, “Operation and Maintenance Code Case Acceptability, ASME OM Code” (ML21181A223), as incorporated by reference in 10 CFR 50.55a, allows grace periods for IST test intervals. ASME OM Code Case OMN-20 allows a 6-month grace period for IST test intervals of 2 years, which is 25 percent of the test interval.

In its alternative request dated August 14, 2023 (ML23226A212), the licensee indicated that the leakage test for RHR cross-connect check valve 251130 at Susquehanna, Unit 2, required by the ASME OM Code during the 2023 RFO had been inadvertently missed. The licensee indicated that a 25-percent grace period for the 2-year leakage test would extend the due date of the test to October 9, 2023. The licensee stated the next RFO for Susquehanna, Unit 2, is scheduled for spring 2025. The licensee indicated that leakage testing of check valve 251130 to satisfy the 2-year leakage test interval required by the ASME OM Code, as incorporated by reference in 10 CFR 50.55a, would require a mid-cycle outage of Susquehanna, Unit 2, to the

cold shutdown condition with the removal of the reactor vessel head. Therefore, the licensee indicated that the performance of a leakage test for check valve 251130 prior to the Susquehanna, Unit 2, spring 2025 RFO would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The licensee stated that check valve 251130 had been leak tested every 2 years during the Fourth 10-Year Interval IST Program at Susquehanna, Unit 2, with the exception that a leak test was not performed during the 2017 Susquehanna, Unit 2, RFO.[1] The licensee indicated that check valve 251130 has historically good performance. As an example, the licensee provided the successful results of leakage tests of check valve 251130 at Susquehanna, Unit 2, since 2007, when the valve was installed. The licensee also provided the successful results of leakage tests of check valve 151130 at Susquehanna, Unit 1, since 2016, when that valve was installed.

In its alternative request dated August 14, 2023 (ML23226A212), for check valve 251130 during the current Fourth 10-Year Interval IST Program, the licensee references alternative request RR-02 submitted on August 3, 2023 (ML23215A173), in which the licensee proposed an alternative to the 2-year leakage test frequency in the ASME OM Code for numerous valves (including check valve 251130) for leakage testing at intervals ranging from every RFO to every third RFO during the upcoming Fifth 10-Year Interval IST Program at Susquehanna, Units 1 and 2. The NRC staff is currently reviewing alternative request RR-02 for authorization to implement the alternative testing approach during the Fifth 10-Year Interval IST Program at Susquehanna, Units 1 and 2, which is scheduled to begin on June 1, 2024. Because of the overlapping requests by the licensee regarding check valve 251130, the NRC staff evaluated the licensee's alternative request dated August 14, 2023, as an extension of the leakage test interval for check valve 251130 until the spring 2025 RFO at Susquehanna, Unit 2. The alternative request for the leakage testing interval for check valve 251130 might extend into the Fifth 10-Year Interval IST Program if the NRC staff's review of alternative request RR-02 is not complete by June 1, 2024.

For many years, the ASME OM Code as incorporated by reference in 10 CFR 50.55a has required the performance of leakage tests of OM Category A valves other than CIVs every 2 years at each nuclear power plant. As an alternative to this time-specific requirement in ASME OM Code, Subsection ISTC, paragraph ISTC-3630, some nuclear power plant licensees have submitted alternative requests to implement a performance-based approach for establishing a leakage test interval for their OM Category A valves other than CIVs. In support of these alternative requests, licensees have demonstrated the successful performance of the valves within the scope of each alternative request, including their leak-tight integrity, over an extended period of time. Licensees have also specified provisions to reduce the performance-based test interval for any valves that failed their leakage tests until their successful performance is demonstrated. The NRC staff has authorized many performance-based alternative requests related to the 2-year leakage test interval required in the ASME OM Code, Subsection ISTC, paragraph ISTC-3630. In some instances, licensees have implemented these performance-based alternatives over long periods of time. Examples of prior NRC authorizations include the safety evaluation dated December 30, 2015 (ML15310A406), for the Tenth 10-Year Interval IST Program at the Hatch nuclear plant; the safety evaluation dated September 28, 2010 (ML102360570), for the Third 10-Year Interval IST Program at the Fermi 2 nuclear plant; and the safety evaluation dated January 24, 2020 (ML20014E731), for the Fourth

[1] The omission of the leakage test of check valve 251130 at Susquehanna, Unit 2, during the 2017 RFO is outside the scope of the licensee's request and this alternative regarding the missed leakage test during the 2023 RFO. Missed IST Program tests without submittal of a proposed alternative request by the licensee within the grace period of the IST test interval would be evaluated under the NRC's Reactor Oversight Process and enforcement policy.

10-Year Interval IST Program at the Fermi 2 nuclear plant. With respect to Susquehanna Susquehanna, Units 1 and 2, the NRC staff authorized a performance-based alternative to ASME OM Code, Subsection ISTC, paragraph ISTC-3630, for the Fourth 10-Year Interval IST Program in a safety evaluation dated May 22, 2014 (ML14122A197). The NRC staff finds that the successful experience regarding valve leakage test intervals support the proposed extension of the leakage test interval for check valve 251130 until the spring 2025 RFO at Susquehanna, Unit 2.

Based on the information provided by the licensee, the NRC staff found that (1) previous leakage testing of check valve 251130 indicates acceptable historical performance, (2) ongoing IST activities have not identified valve performance concerns, (3) periodic maintenance activities will continue, and (4) a hardship exists for the performance of leakage testing of this check valve prior to the spring 2025 RFO at Susquehanna, Unit 2. Therefore, the NRC determined that the licensee's proposed alternative dated August 14, 2023, for a one-time extension of the leakage testing interval for check valve 251130 to the next RFO in spring 2025 for Susquehanna, Unit 2, is acceptable in accordance with 10 CFR 50.55a(z)(2). The NRC staff also determined that the proposed alternative would provide reasonable assurance that check valve 251130 at Susquehanna, Unit 2, will be operationally ready to perform its safety function until the next RFO in spring 2025.

CONCLUSION

As set forth above, the NRC staff has determined that complying with the leakage test requirement in the ASME OM Code as incorporated by reference in 10 CFR 50.55a for RHR cross-connect check valve 251130 at Susquehanna, Unit 2, as described in the licensee's alternative request dated August 14, 2023, prior to the spring 2025 RFO would result in a hardship or unusual difficulty, without a compensating increase in the level of quality and safety. Based on its review including the performance history of the valve, the NRC staff has determined that the proposed alternative will provide reasonable assurance that check valve 251130 will be operationally ready to perform its safety function until the spring 2025 RFO at Susquehanna, Unit 2. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC staff authorizes the Alternative Request for Valve 251130 dated August 14, 2023, until completion of the spring 2025 RFO at Susquehanna, Unit 2.

All other ASME OM Code requirements, as incorporated by reference in 10 CFR 50.55a, for which relief or an alternative was not specifically requested and granted, or authorized (as appropriate), in the subject request remain applicable.

Principal Contributor: Thomas G. Scarbrough, NRR

Signature:

Hipolito J. Gonzalez

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SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2 - AUTHORIZATION AND SAFETY EVALUATION FOR ALTERNATIVE REQUEST FOR VALVE 251130 (EPID L-2023-LLR-0045) DATED SEPTEMBER 19, 2023

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