

REQUEST FOR SUPPLEMENTAL INFORMATION (RSI)

AUGUST 4, 2022¹, EXEMPTION REQUEST FOR DEVIATING FROM THE CONDITIONS OF

CERTIFICATE OF COMPLIANCE NO. 1032, AMENDMENT NO. 3

SEQUOYAH NUCLEAR PLANT

INDEPENDENT SPENT FUEL STORAGE INSTALLATION

EPID No.: L-2022-LLE-0027

Docket No. 72-034

Material Discipline

RSI-M1

Provide the following supplemental information on the original shell-to-shell longitudinal weld, the radiography testing (RT) results that identified a defect located in the shell-to-shell longitudinal weld between 4 to 14 inches from the bottom of the multipurpose canister (MPC) baseplate, and the method used in the repair weld.

- (a) Describe the welding process used for the original weld.
- (b) Describe the original RT results that identified the initial defect(s) located between 4 to 14 inches from the bottom of the MPC baseplate including the size, location, orientation, and type of defect(s).
- (c) Describe the original weld joint geometry and a sketch or detailed dimensions of the weld excavation.
- (d) Describe the welding process was used for the first repair weld.

The applicant provided that the original RT identified a defect which located in the shell-to-shell longitudinal weld between 4 to 14 inches from the bottom of the MPC baseplate. The applicant stated that this defect required an excavation of approximately 6.5" long, 5/8" wide, and 9/32" deep. However, it is unclear where the defect was located with respect to the original joint configuration. In addition, the welding process used for the repair weld is not described in the exemption request.

This information is necessary to determine compliance with Title 10 of the *Code of Federal Regulations* (10 CFR), 72.236(g), (j), and (l).

¹ By letter dated August 4, 2022 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML22216A078), Tennessee Valley Authority submitted to the U.S. Nuclear Regulatory Commission (NRC) an exemption request for the Sequoyah Nuclear Plant (SQN) Independent Spent Fuel Storage Installation (ISFSI), in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 72.7, "Specific exemptions," from the requirements of 10 CFR 72.212(a)(2), 72.212(b)(3), 72.212(b)(5)(i), 72.212(b)(11) and 72.214. Specifically, the exemption request would, if granted, permit SQN ISFSI to deviate from conditions of the NRC Certificate of Compliance (CoC) No. 1032, Amendment No. 3 (ADAMS Accession No. ML17214A039), Appendix B, Section 3.3, "Codes and Standards."

Enclosure

RSI-M2

Provide the following supplemental information on the RT results of the repaired shell-to-shell longitudinal weld that identified a defect located in the shell-to-shell longitudinal weld between 8.5 to 25 inches from the bottom of the MPC baseplate.

- (a) Describe the RT results for the repaired weld that identified the defect(s) located between 8.5 to 25 inches from the bottom of the MPC baseplate.
- (b) Clarify whether the initial RT did not identify indications that were observed in a second RT in the area from 8.5 to 25 inches from the bottom of the MPC baseplate.
- (c) Describe the RT results that identified the defect(s) located between 8.5 to 25 inches from the bottom of the MPC baseplate including the size, location, orientation, and type of defect(s).
- (d) Describe the original and repair weld joint geometry and a sketch or detailed dimensions of the weld excavation between 8.5 to 25 inches from the bottom of the MPC baseplate.
- (e) Describe the welding process that was used for the second repair weld. The applicant stated that a second RT was performed after the first repair which identified another defect located in the shell-to-shell longitudinal weld. This defect required an excavation of approximately 16.5" long, 5/8" wide, and 1/4" deep. It appears that there is an overlap of 5.5 inches between the two repairs. It is unclear whether the second defect was missed by the original RT, or this excavation was necessary to remove defect(s) in the first repair weld.

This information is necessary to determine compliance with 10 CFR 72.236(g), (j), and (l).

Structural Discipline

RSI-S1

Provide revision 20 of Holtec Report HI-2094418, "Structural Calculation Package for HI-STORM FW System," and state why revision 20 is the version used and/or applicable for this exemption request.

As stated in safety evaluation report for the missing radiographic examination (RT), the evaluation mirrors the methodology, acceptance criteria, and finite element model from Supplement 1 of Holtec Report HI-2094418, revision 20, with some exemptions. The evaluation also utilizes the stress results from the finite element analysis provided in the report. However, this analysis report was not included in support of the evaluation.

This information is necessary to evaluate the requested exemption, under 10 CFR 72.7, from the requirements of 10 CFR 72.154(b), 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214.

RSI-S2

Evaluate the potential of crack propagation from thermal cycling on potential flaws or imperfections on sections of the multipurpose canister (MPC) longitudinal shell-to-shell weld where the RT was missed.

As described in Holtec Report No. HI-2114830, "HI-STORM FW FSAR," structural welds rely, in part, in welding operations to be performed in accordance with the requirements of codes and

standards to ensure, in part, that no risk of crack propagation under the applicable stress levels will occur. However, the structural evaluation does not address the potential of crack propagation of flaws or imperfections that may have not been identified at the MPC longitudinal shell-to-shell weld sections where the RT was missed.

This information is necessary to evaluate the requested exemption, under 10 CFR 72.7, from the requirements of 10 CFR 72.154(b), 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214.

RSI-S3

The safety analysis does not address the effects of local membrane plus primary bending stress at the sections of the MPC longitudinal shell-to-shell weld where the RT was missed.

The safety evaluation of the missing RT on the MPC longitudinal shell-to-shell weld did not consider the impact of local membrane plus primary bending stresses at the affected region. Therefore, it is not clear whether the proposed stress-reduction factor (SRF) the MPC confinement boundary stress intensity limits are met.

This information will be necessary to evaluate the requested exemption, under 10 CFR 72.7, from the requirements of 10 CFR 72.154(b), 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214.

Observations – Structural Discipline

The staff has observed the following based on the preliminary review of the information as provided by Sequoyah Nuclear Plant (SQN). Note that additional information will be required for resolution. The staff notes that a response to this observational question is not required at this time as part of the RSI response from SQN.

Adequate technical justification is necessary to demonstrate why a qualification factor of 0.75, as required in ASME Section III, Subsection NG, for a Category A full penetration, is not applicable for the safety evaluation of the missing RT on MPC longitudinal shell-to-shell weld.

Section 3 of exemption request states that the use of a quality factor of 0.75 is an overly conservative lower bound for the SRF associated with the shell-to-shell plate weld since more than 98% of the weld has been examined by RT. However, this argument does not provide adequate technical basis to justify the use of less conservative SRF (e.g., 0.8 vs. 0.75).

This information will be necessary to evaluate the requested exemption, under 10 CFR 72.7, from the requirements of 10 CFR 72.154(b), 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214.