



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

May 10, 2022

ANO Site Vice President
Arkansas Nuclear One
Entergy Operations, Inc.
N-TSB-58
1448 S.R. 333
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 1 - REVIEW OF THE SPRING 2021 STEAM GENERATOR TUBE INSPECTIONS DURING REFUELING OUTAGE 1R29 (EPID L-2021-LRO-0053)

Dear Sir or Madam:

By letters dated October 22, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21295A720), and February 3, 2022 (ML22034A899), Entergy Operations, Inc. (the licensee) submitted information to the U.S. Nuclear Regulatory Commission (NRC) summarizing the results of the spring 2021 steam generator (SG) tube inspections performed during refueling outage 1R29 at Arkansas Nuclear One, Unit 1. The SG tube inspection report dated February 3, 2022, was submitted in accordance with Technical Specification (TS) 5.6.7, "Steam Generator Tube Inspection Report," fulfilling a commitment made by the licensee to submit a revised SG tube inspection after adopting revised SG TSs in accordance with Technical Specification Task Force Traveler (TSTF)-577, "Revised Frequencies for Steam Generator Tube Inspections."

The NRC staff has completed its review of the submittals and concludes that the licensee provided the information required by TS 5.6.7. No follow-up is required at this time. The NRC staff's review of the reports is enclosed.

If you have any questions, please contact me at (301) 415-4037 or by email at Thomas.Wengert@nrc.gov.

Sincerely,

/RA/

Thomas J. Wengert, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosure:
Review of the Steam Generator Tube
Inspection Report

cc: Listserv

REVIEW OF THE SPRING 2021 STEAM GENERATOR TUBE
INSERVICE INSPECTIONS PERFORMED DURING REFUELING OUTAGE 1R29
ENTERGY OPERATIONS, INC.
ARKANSAS NUCLEAR ONE, UNIT NO. 1
DOCKET NO. 50-313

By letters dated October 22, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21295A720), and February 3, 2022 (ML22034A899), Entergy Operations, Inc. (the licensee) submitted information summarizing the results of the spring 2021 steam generator (SG) tube inspections performed during refueling outage 29 (1R29) at Arkansas Nuclear One, Unit 1 (ANO-1). The licensee submitted the SG tube inspection report dated February 3, 2022, in accordance with Technical Specification (TS) 5.6.7, "Steam Generator Tube Inspection Report," fulfilling a commitment in letter dated July 1, 2021 (ML21182A158), to submit a revised SG tube inspection report after adopting revised SG TSs in accordance with Technical Specification Task Force Traveler (TSTF)-577, "Revised Frequencies for Steam Generator Tube Inspections." TSTF-577 was approved for ANO-1 in Amendment No. 273 dated December 8, 2021 (ML21313A008).

The two SGs at ANO-1 are Enhanced Once-Through SGs manufactured by AREVA. Each SG contains 15,597 thermally treated Alloy 690 tubes. The tubes have a nominal outside diameter of 0.625 inches and a nominal wall thickness of 0.037 inches. The tubes were hydraulically expanded for the full depth of the tubesheet and are supported by 15 stainless steel tube support plates (TSPs) with broached trefoil-shaped holes.

The licensee provided the scope, extent, methods, and results of the SG tube inspections in the letters referenced above. In addition, the licensee described corrective actions (tube stabilization and plugging) taken in response to the inspection findings.

Based on the review of the information provided by the licensee, the U.S. Nuclear Regulatory Commission (NRC) staff has the following comments/observations:

- The operational assessment used a full bundle, fully probabilistic model to assess broached TSP wear growth, and a deterministic analysis for assessment of drilled TSP wear growth, through operating cycle 32.
- One indication of tube-to-tie-rod wear (TRW) was detected in each SG during 1R29. These were the first indications of TRW in either SG. Both indications were under 10 percent through-wall. This form of degradation was identified in the licensee's degradation assessment as a potential degradation mechanism.
- In both SGs, the amount of tie-rod bowing has remained under the historical projections that were made when bowing was first detected (SG A – 1R20; SG B – 1R23). The amount of tie-rod bowing in both SGs appears to have stopped increasing after 1R26, and many of the tie-rods in both SGs have not seen increased bowing since 1R24. SG A still has more tie-rod bowing than SG B.

Based on the review of the information provided, the NRC staff concludes that the licensee provided the information required by ANO-1 Technical Specification 5.6.7, "Steam Generator Tube Inspection Report." In addition, the NRC staff concludes that there are no technical issues that warrant follow-up action at this time because the inspections appear to be consistent with the objective of detecting potential tube degradation and the inspection results appear to be consistent with industry operating experience at similarly designed and operated units.

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 1 - REVIEW OF THE SPRING 2021 STEAM GENERATOR TUBE INSPECTIONS DURING REFUELING OUTAGE 1R29 (EPID L-2021-LRO-0053) DATED MAY 10, 2022

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