

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

August 26, 2021

Mr. Steven M. Snider Vice President, Oconee Nuclear Station Duke Energy Carolinas, LLC 7800 Rochester Highway Seneca, SC 29672-0752

SUBJECT: OCONEE NUCLEAR STATION, UNIT 1 – REVIEW OF THE FALL 2020 STEAM GENERATOR TUBE INSPECTION REPORT (EPID L-2021-LRO-0002)

Dear Mr. Snider:

By letter dated February 11, 2021, Duke Energy (the licensee) submitted information summarizing the results of the fall 2020 steam generator inspections performed at Oconee Nuclear Station, Unit 1, during refueling outage 31 (O1R31).

The U. S. Nuclear Regulatory Commission (NRC) staff has completed its review of the report and concludes that the licensee provided the information required by their technical specifications and that no additional follow-up is required at this time. The NRC staff's review is enclosed.

If you have any questions, please contact me at 301-415-0615 or via e-mail at <u>Zackary.Stone@nrc.gov</u>.

Sincerely,

Zackary R. Stone, Project Manager Plant Licensing Branch II-1 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Docket No. 50-269

Enclosure: As Stated

cc: Listserv

OCONEE NUCLEAR STATION, UNIT 1

NRC STAFF REVIEW OF THE

FALL 2020 STEAM GENERATOR TUBE INSPECTION REPORT

DOCKET NO. 50-269

By letter dated February 11, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21042B298), Duke Energy (the licensee) submitted information summarizing the results of the fall 2020 steam generator (SG) inspections performed at Oconee Nuclear Station, Unit 1. The inspections were performed during refueling outage 31 (O1R31).

Oconee, Unit 1, has two replacement once-through steam generators (ROTSGs) designed and fabricated by Babcock and Wilcox International. Each ROTSG has 15,631 thermally treated Alloy 690 tubes with a nominal outside diameter of 0.625 inches and a nominal wall thickness of 0.038 inches. The tubes were hydraulically expanded for 13 inches from the tube end into the 22-inch thick tubesheet. Tube support is provided by 15 Type 410 stainless steel horizontal tube support plates (TSPs) with trifoil broached openings. Some of the openings in the 14th TSP are drilled holes.

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

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

- During O1R31, the licensee implemented two changes affecting the depths, and quantities of TSP wear indications reported. The changes are described in the Oconee Unit 2 inspection report (ADAMS Accession No. ML20070H575) and corresponding response to an NRC request for additional information (ADAMS Accession No. ML20170A475). Specifically, the depth reporting threshold was changed from 5 percent through-wall to 8 percent through-wall to eliminate reporting signals due to tube noise or mix residual as opposed to true tube wear, and a fixed curve for bobbin depth sizing was implemented. The licensee reported that some calibration groups were either overestimating or underestimating growth rates and this variation was due to using different calibration standards from the previous inspection. To normalize the variation, a fixed calibration curve was developed by obtaining a normalization for each standard. Depths were assigned to the various voltage readings to develop a depth versus voltage curve.
- In SG 1A, 19 tubes were plugged due to wear at TSP intersections, and 7 tubes were plugged due to a presumed foreign object (including two tubes with wear attributed to the object). In SG 1B, 27 tubes were plugged due to wear at TSP intersections.
- The maximum depth of wear measured in either of the SGs during O1R31 was 53 percent through-wall (TW) in SG 1A, at Row 75, Column 116, at TSP 11. The wear was tapered and had an equivalent structural depth of 46.1 percent TW. The licensee determined that the maximum measured depth that would meet the structural integrity performance criterion was 54.9 percent TW for wear assumed to be flat rather than tapered.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by their technical specifications. In addition, the NRC staff concludes that there are no technical issues that warrant follow-up action at this time since 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.

Principal Contributor: Gregory Makar

S. Snider

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