



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

November 29, 2022

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 2 – REVIEW OF THE FALL 2021 STEAM  
GENERATOR TUBE INSPECTION REPORT (EPID L-2022-LRO-0069)

Dear Mr. Snider:

By letter dated May 26, 2022, Duke Energy (the licensee) submitted information summarizing the results of the fall 2021 steam generator inspections performed at Oconee Nuclear Station, Unit 2, during refueling outage 30 (O2R30).

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 301-415-1009 or via e-mail at [Shawn.Williams@nrc.gov](mailto:Shawn.Williams@nrc.gov).

Sincerely,

*/RA/*

Shawn A. Williams, Senior Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-270

Enclosure:  
As Stated

cc: Listserv

OCONEE NUCLEAR STATION, UNIT 2  
NRC STAFF REVIEW OF THE  
FALL 2021 STEAM GENERATOR TUBE INSPECTION REPORT  
DOCKET NO. 50-270

By letter dated May 26, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22146A348), Duke Energy (the licensee) submitted information summarizing the results of the fall 2021 steam generator (SG) inspections performed at Oconee Nuclear Station, Unit 2, during refueling outage 30 (O2R30).

Oconee, Unit 2, has two replacement once-through steam generators (OTSGs) designed and fabricated by Babcock and Wilcox International. Each OTSG 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 stainless steel horizontal tube support plates (TSPs) with trifoil broached openings. Some of the openings in the 14<sup>th</sup> 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.

After reviewing the information provided, the NRC staff noted the following:

- During O2R29 (fall 2019), 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 (ML20070H575) and corresponding response to an NRC request for additional information (ML20170A475). Specifically, the depth reporting threshold was changed from 5 percent through-wall (TW) to 8 percent TW 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. The sizing calibration curve was established using three points from the depth versus voltage curve.
- During O2R30, the licensee assigned a Historical No Change (HNC) code to tube-to-tube wear (TTW) indications in the 2A and 2B SGs that had been inspected at least three previous times with the array probe and showed no change in the bobbin probe signal. Thirty-three HNC indications were assigned in SG 2A and 24 HNC indications were assigned in SG 2B. Previously reported bobbin flaws that did not meet the HNC criteria were reported as TTW. New bobbin flaws of possible TTW were reported as absolute drift indications.

- One indication of presumed foreign object wear was reported in SG 2A slightly above the 13<sup>th</sup> TSP and one indication of foreign object wear with a possible loose part present was reported in SG 2B at the lower tubesheet. The maximum depths reported were 13 percent TW and 12 percent TW, respectively.
- A total of 25 tubes were plugged in SG 2A, all due to wear. A total of 27 tubes were plugged in SG 2B, with 23 due to wear and the remaining 4 tubes due to a presumed foreign object with wear at the top of the tubesheet.

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

SUBJECT: OCONEE NUCLEAR STATION, UNIT 2 – REVIEW OF THE FALL 2021 STEAM GENERATOR TUBE INSPECTION REPORT (EPID L-2022-LRO-0069)  
 DATED NOVEMBER 29, 2022

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