

January 26, 2017

Mr. Thomas D. Ray  
Vice President  
Oconee Nuclear Station  
Duke Energy Carolinas, LLC  
7800 Rochester Highway  
Seneca, SC 29672-0752

SUBJECT: OCONEE NUCLEAR STATION, UNITS 2 AND 3 – REVIEW OF STEAM  
GENERATOR TUBE INSERVICE INSPECTION REPORTS (CAC NOS. MF8371  
AND MF8372)

Dear Mr. Ray:

The U.S. Nuclear Regulatory Commission (NRC) staff formally reviews all steam generator (SG) inservice inspection summary reports submitted by licensees in accordance with the plant's Technical Specification (TS) requirements. By letters dated February 10 and August 15, 2016, Duke Energy Carolinas, LLC (the licensee), submitted information summarizing the results of the most recent SG tube inspections performed at Oconee Nuclear Station (ONS), Units 2 and 3, respectively. These inspections were performed during the refueling outage following Cycle 27 for Unit 2 (fall of 2015), and the refueling outage following Cycle 28 for Unit 3 (spring of 2016).

The NRC staff has completed its review of the information provided and concludes that the licensee provided the information required by the ONS TSs, and no additional action is required at this time. The NRC staff's review is enclosed and this action concludes the staff's review associated with CAC Nos. MF8371 and MF8372.

If you have any questions, please contact me at (301) 415-4032 or via e-mail at [Randy.Hall@nrc.gov](mailto:Randy.Hall@nrc.gov).

Sincerely,

**/RA/**

James R. Hall, Senior Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-270 and 50-287

Enclosure:  
As stated

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OCONEE NUCLEAR STATION, UNITS 2 AND 3 – REVIEW OF STEAM GENERATOR TUBE  
INSERVICE INSPECTION REPORTS (CAC NOS. MF8371 AND MF8372) DATED  
JANUARY 26, 2017

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**ADAMS Accession No.: ML17019A050**

**\*via memo dated**

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OFFICE OF NUCLEAR REACTOR REGULATION  
REVIEW OF STEAM GENERATOR TUBE INSERVICE INSPECTION REPORTS  
DUKE ENERGY CAROLINAS, LLC  
OCONEE NUCLEAR STATION, UNITS 2 AND 3  
DOCKET NOS. 50-270 AND 50-287

By letters dated February 10 and August 15, 2016, (Agencywide Documents Access and Management System Accession Nos. ML16047A334 and ML16232A066, respectively), Duke Energy Carolinas, LLC (the licensee) submitted information summarizing the results of the most recent steam generator (SG) tube inspections performed at the Oconee Nuclear Station (ONS), Units 2 and 3. These inspections were performed during the fall 2015 (Cycle 27) refueling outage for Unit 2, and during the spring 2016 (Cycle 28) refueling outage for Unit 3.

ONS Units 2 and 3 are two-loop pressurized-water reactors with replacement once-through steam generators (ROTSGs) manufactured by Babcock & Wilcox, Canada. The Unit 2 ROTSGs were installed during that unit's spring 2004 refueling outage, and the Unit 3 ROTSGs were installed during that unit's fall 2004 refueling outage. The ROTSGs contain 15,631 thermally treated Alloy 690 tubes that have been hydraulically expanded into the tubesheet to a depth of 13 inches. Tube support is provided by 15 Type 410 stainless steel tube support plates (TSP) of trifoil broach design; however, there are some round drilled openings at the 14th TSP.

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

The first inservice inspections of the ROTSGs at ONS Unit 2 (fall 2005) and ONS Unit 3 (spring 2006) revealed unexpected, widespread wear degradation of the tubing at TSP locations (TSP wear). ONS Unit 1 has also experienced this widespread TSP wear degradation. The licensee has managed this degradation with no loss of tube integrity. The staff noted that the 2015 inspection results for Unit 2 indicated that the average growth rate and the 95<sup>th</sup> percentile growth rate had increased, consistent with inspection data for SGs of similar design. During the Unit 3 outage, the licensee plugged one tube for foreign object wear with a possible loose part present in SG A, and plugged one other tube for a dent with an indication of a possible loose part in SG A.

Based on a review of the information provided, the staff concludes that the licensee provided the information required by its technical specifications. In addition, the 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: Andrew Johnson