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

August 14, 2017

Mr. Tom Simril
Site Vice President
Catawba Nuclear Station, Unit 2
Duke Energy Carolinas, LLC
4800 Concord Road
York, SC 29745

SUBJECT: CATAWBA NUCLEAR STATION, UNIT 2 – REVIEW OF THE STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT FOR THE FALL 2016 REFUELING OUTAGE 21 (CAC NO. MF9079)

Dear Mr. Simril:

By letter dated January 6, 2017 (Agencywide Documents Access and Management System, (ADAMS) Accession No. ML17010A282), as supplemented by letter dated May 24, 2017 (ADAMS Accession No. ML17146A907), Duke Energy Carolinas, LLC (the licensee) submitted information summarizing the results of their fall 2016 steam generator (SG) tube inservice inspections at the Catawba Nuclear Station (Catawba), Unit 2. These inspections were performed during refueling outage 21.

The U. S. Nuclear Regulatory Commission (NRC) staff has completed its review of the information and concludes that the licensee has provided the information required by the Catawba, Unit 2, Technical Specifications. No additional follow up is necessary at this time. The NRC staff's review of the SG inspection report is enclosed.

If you have any questions, please contact me at 301-415-3867 or via e-mail at Michael.Mahoney@nrc.gov.

Sincerely,

Michael Mahoney, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-414

Enclosure:
As stated

cc w/encl: Distribution via ListServ

UNITED STATES
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STAFF EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RESULTS OF THE 2016 STEAM GENERATOR

TUBE INSERVICE INSPECTION REPORT

DUKE ENERGY CAROLINAS, LLC

CATAWBA NUCLEAR STATION, UNIT 2

DOCKET NO. 50-414

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated January 6, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17010A282), as supplemented by letter dated May 24, 2017 (ADAMS Accession No. ML17146A907), Duke Energy Carolinas, LLC (the licensee), submitted information summarizing the results of their fall 2016 steam generator (SG) tube inservice inspections. The inspections were performed during the end of cycle 21 refueling outage (RFO) at the Catawba Nuclear Station (Catawba), Unit 2.

Catawba, Unit 2, has four Westinghouse model D5 SGs, which are designated 2A through 2D. Each SG has 4,570 thermally treated Alloy 600 tubes with a nominal outside diameter of 0.750 inches and a nominal wall thickness of 0.043 inches. The tubes are hydraulically expanded for the full-depth of the tubesheet at each end. The tubes are supported by Type 405 stainless steel support plates with quatrefoil-shaped holes. The U-bend region of the tubes in rows 1 through 9 was thermally treated after bending, in order to reduce stress.

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.

- At the end of operational cycle 18 (i.e., in RFO 18), the replacement SGs had 21.50 cumulative effective full power years (EFPY) of operation. In RFO 19, RFO 20, and RFO 21, the replacement SGs had 22.89, 24.24, and 25.67 EFPY of operation, respectively.

- During RFO 21, the licensee plugged 16 tubes in SG 2A, 13 tubes in SG 2B, 12 tubes in SG 2C, and six tubes in SG 2D for a total of 47 plugged tubes in all SGs. In response to the NRC staff's request for additional information dated April 25, 2017 (ADAMS Accession No. ML17115A142), the licensee clarified in their letter dated May 24, 2017, the number of plugged tubes in SG 2C. All but four tubes were high stress (2-sigma) tubes that were plugged preventatively since the licensee plans to skip inspection during RFO 22. The remaining four tubes were located either adjacent to, or downstream of a foreign object. No new foreign objects were identified in the SGs during RFO 21.

- During the SG bowl cladding inspections, the licensee identified an area of missing stainless steel cladding in the SG 2D hot leg channel head. The irregularly shaped area is approximately 5 1/8 inches long and 15/16 inches wide. The original equipment manufacturer performed an evaluation of the area and concluded that grinding activities in this region during fabrication resulted in very thin cladding and/or exposed base metal.

- The licensee's evaluation determined that it was not credible for a large fragment of cladding to break away and enter the reactor coolant system. The thinned cladding area was not repaired since analysis supported operation until the next refueling outage. This area of the 2D SG channel head will be re-inspected during the next steam generator inspection.

- No degradation was detected during the upper bundle visual inspection in SG 2A.

- No primary to secondary leakage was detected during operating cycle 21 and the calculated leakage rate from the portion of the tubes more than 14.01 inches from the top of the tubesheet was zero.

Based on the above, 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. 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: P. Klein, NRR

Dated: August 14, 2017

SUBJECT: CATAWBA NUCLEAR STATION, UNIT 2 – REVIEW OF THE STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT FOR THE FALL 2016 REFUELING OUTAGE 21 (CAC NO. MF9079) DATED AUGUST 14, 2017

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