



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

August 26, 2019

Mr. J. Ed Burchfield, Jr.
Site Vice President
Oconee Nuclear Station
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672-0752

**SUBJECT: OCONEE NUCLEAR STATION, UNIT 1 – REVIEW OF STEAM GENERATOR
INSERVICE INSPECTION REPORT FOR UNIT 1 END OF CYCLE 30
REFUELING OUTAGE (EPID L-2019-LRO-0004)**

Dear Mr. Burchfield:

By letter RA-19-0093 dated February 7, 2019 (Agencywide Documents Access and Management Systems Accession No. ML19042A098), Duke Energy Carolinas, LLC (the licensee) submitted its steam generator tube inspection report for Oconee Nuclear Station, Unit 1 (Oconee 1) in accordance with Technical Specification (TS) 5.6.8, "Steam Generator Tube Inspection Report." The report summarizes the steam generator tube inspections that the licensee performed in fall 2018 during the Oconee 1 Cycle 30 refueling outage. The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the submittal and concludes that the licensee provided the information required by TS 5.6.8. The enclosure documents the NRC staff's review of the submittal and completes the NRC staff's efforts for Enterprise Project Identifier (EPID) L-2019-LRO-0004.

Any inquiries can be directed to Ms. Audrey Klett at 301-415-0489 or via e-mail at Audrey.Klett@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to be "AK", is located below the "Sincerely," text.

Audrey Klett, 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 w/encl: Listserv

REVIEW BY THE OFFICE OF NUCLEAR REACTOR REGULATION
FALL 2018 STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT
DUKE ENERGY CAROLINAS, LLC
OCONEE NUCLEAR STATION, UNIT 1
DOCKET NO. 50-269

By letter dated February 7, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19042A098), Duke Energy, LLC (the licensee) submitted information summarizing the results of the fall 2018 steam generator (SG) tube inspections that were performed at Oconee Nuclear Station, Unit 1 (Oconee 1) during the Cycle 30 refueling outage. By letter dated July 31, 2019 (ADAMS Accession No. ML19213A010), the licensee submitted a response to a staff request for additional information. Oconee 1 has two replacement once-through steam generators (OTSGs) designed and fabricated by Babcock and Wilcox International. These OTSGs were put into service in 2004. 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. The licensee provided the scope, extent, methods, and results of its SG tube inspections. In addition, the licensee described corrective actions, such as tube plugging, taken in response to the inspection findings.

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

- A total of 22,253 indications of tube support plate (TSP) wear were identified in 9,341 tubes in SG 1A. A total of 17,676 indications were identified in 8,809 tubes in SG 1B. The number of indications greater than or equal to 10 percent through-wall (TW) increased in SG 1A, while the number of indications greater than or equal to 10 percent TW decreased in SG 1B. The largest indication of wear was 58 percent TW.
- In fall 2012, the licensee's operational assessment (OA) for Oconee 1 projected an upper value of 57.6 percent TW for TSP wear by the fall 2014 inspection. As discussed in ONS-2015-031 dated March 6, 2015 (ADAMS Accession No. ML15072A185), the TSP wear indication was measured in 2014 with a depth of 59 percent TW. Considering this experience and the number of flaws at Oconee, Unit 1, simplified methodologies may become non-conservative and a fully probabilistic methodology may be necessary. By letter dated July 31, 2019, the licensee confirmed that a fully probabilistic methodology was used for the OA at Oconee 1, in accordance with Revision 4 of the Steam Generator Integrity Assessment Guidelines.

Enclosure

Based on its review of the information provided, the NRC staff concludes that the licensee provided the information required by Technical Specification 5.6.8, "Steam Generator Tube Inspection Report." In addition, the NRC staff concludes that there are no technical issues currently that warrant follow-up action because the inspections seem consistent with the objective of detecting potential tube degradation and the inspection results seem consistent with industry operating experience at similarly designed and operated units.

Principal Contributor: Alan T. Huynh

Date: August 26, 2019

SUBJECT: OCONEE NUCLEAR STATION, UNIT 1 – REVIEW OF STEAM GENERATOR
INSERVICE INSPECTION REPORT FOR UNIT 1 END OF CYCLE 30
REFUELING OUTAGE (EPID L-2019-LRO-0004) DATED AUGUST 26, 2019

DISTRIBUTION:

PUBLIC

LPLII-1 R/F

RidsNrrPMOconee Resource

RidsNrrLAKGoldstein Resource

RidsNrrDorlLp2-1 Resource

RidsACRS_MailCtr Resource

RidsRgn2MailCenter Resource

RidsNrrDlmrMccb Resource

SBloom, NRR/DMLR

Paul Klein, NRR/DMLR

Alan Huynh, NRR/DMLR

Andrew Johnson, NRR/DMLR

ADAMS Accession No.: ML19233A171

***by memorandum**

OFFICE	NRR/DORL/SLPB/PM	NRR/DORL/LPL2-1/LA	NRR/DMLR/MCCB/BC*
NAME	VThomas	KGoldstein	SBloom
DATE	08/21/19	08/22/19	08/20/19
OFFICE	NRR/DORL/LPL2-1/BC	NRR/DORL/LPL2-1/PM	
NAME	MMarkley (JLamb for)	AKlett	
DATE	08/26/19	08/26/19	

OFFICIAL RECORD COPY