

NRR-DRMAPEm Resource

From: Klett, Audrey
Sent: Monday, July 8, 2019 2:53 PM
To: Zaremba, Arthur H.
Subject: NRC Request for Additional Information for Oconee SGTIR 01R30
Attachments: Oconee 1 Fall 2018 SGTIR 01R30 Final RAI.DOCX

Hi Art,

Attached is the RAI for NRC's review of Oconee SGTIR 01R30. As discussed on our clarification call today, NRC is requesting a due date of 30 days from today. Please call me if you have any questions.

-Audrey

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OCONEE NUCLEAR STATION, UNIT 1

NRC REQUEST FOR ADDITIONAL INFORMATION

FALL 2018 STEAM GENERATOR TUBE INSPECTION REPORT

DOCKET NO. 50-269

By letter dated February 07, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19042A098), Duke Energy (the licensee) submitted information summarizing the results of the fall 2018 steam generator (SG) inspections performed at Oconee Nuclear Station, Unit 1. These inspections were performed during refueling outage (RFO) 30. Technical Specification (TS) 5.6.8 requires that a report be submitted within 180 days after the initial entry into hot shutdown following completion of an inspection of the replacement SGs performed in accordance with TS 5.5.10, which requires that an SG Program be established and implemented to ensure SG tube integrity is maintained.

Background

Technical Specification 5.5.10.b.1 requires tube structural integrity to be maintained over the full range of normal operating conditions, all anticipated transients included in the design specification, and design basis accidents. Technical Specifications 5.5.10.b.2 and 5.5.10.b.3 provide provisions for accident induced leakage and operational leakage, respectively. One contributing factor to ensuring tube integrity includes removing tubes from service if they are expected to be unable to meet the structural and/or leakage integrity criteria. Tubes with indications of 40 percent through-wall (TW) or greater are plugged in accordance with TS 5.5.10.c. Tubes with indications less than 40 percent TW may also be plugged due to results of forward-looking operational assessments (OAs), which project the condition of the SG tubes to the time of the next scheduled inspection outage and determine their acceptability relative to the tube integrity performance criteria.

Licensees typically use one or more of the methodologies outlined in Chapter 8 of the Electric Power Research Institute (EPRI) Steam Generator Integrity Assessment Guidelines (proprietary). The methodologies include simplified analysis (arithmetic, simplified statistical, and Monte Carlo) and fully probabilistic methodologies.

Issue

Although the simplified methodologies can provide conservative projections of the condition of SG tubes, there are situations where the simplified procedures can become non-conservative. As stated, in part, in the EPRI Steam Generator Integrity Assessment Guidelines, Revision 4, "...as the flaw population increases in size, the single-flaw method becomes less and less conservative." During the fall 2018 outage (RFO 30), the licensee identified a total of 22,253 indications of TSP wear in 9,341 tubes in SG 1A and 17,676 indications of TSP wear in SG 1B, with the largest indication measured at 58 percent TW.

The EPRI Steam Generator Integrity Assessment Guidelines, Revision 4, also discuss the potential non-conservative assessment of simplified methods when OAs consistently under-predict the size of the worst case degraded tube. In the fall of 2012, the Oconee, Unit 1, OA projected an upper value of 57.6 percent TW for tube support plate (TSP) wear by the fall

2014 inspection. In the fall of 2014, a TSP wear indication was measured with a depth of 59 percent TW (ADAMS Accession No. ML15238B616).

Request

The staff requests the licensee to discuss whether a fully probabilistic OA methodology was used to project the condition of the SG tubes at Oconee, Unit 1.

If a fully probabilistic methodology was not used, then the staff requests the licensee to address the following:

- a. Describe the simplified analysis methodology used and the basis for its acceptability.
- b. Given the number of flaws identified at Oconee, Unit 1 and that a previous OA in 2012 slightly underpredicted the upper value of flaw depth, discuss any analyses performed to determine that a fully probabilistic analysis was not needed (e.g., Section 8.2.4 of the Steam Generator Integrity Assessment Guidelines provides a possible approach).