



June 24, 2020
L-2020-111
10 CFR 50.36

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-00001

Re: Turkey Point Unit 4
Docket No. 50-251
Response to Request for Additional Information Regarding
Steam Generator Tube Inspection Report

References:

1. Florida Power & Light Company letter, L-2019-175, "Turkey Point Unit 4, Docket No. 50-251, Steam Generator Tube Inspection Report," September 25, 2019 (ML19268B738)
2. NRC email, "Turkey Point Unit 4 – Request for Additional Information Concerning Spring 2019 Steam Generator Tube Inspections (EPID: L-2019-LRO-0103)," May 27, 2020.

By letter dated September 25, 2019, Florida Power & Light Company (FPL) submitted the Turkey Point Unit 4 Cycle 31 Refueling Outage Steam Generator Tube Inspection Report (Reference 1) in accordance with Technical Specification 6.8.4.j, Steam Generator (SG) Program.

On May 27, 2020, the NRC requested additional information regarding Reference 1. The attachment to this letter provides FPL's response to the request for additional information (Reference 2).

Should there be any questions, please contact Mr. Robert Hess, Licensing Manager, at (305) 246-4112.

Sincerely,

A handwritten signature in dark ink, appearing to be 'RH', is written over a horizontal line that extends to the right.

Robert Hess
Licensing Manager
Turkey Point Nuclear Plant

Attachment

cc: Regional Administrator, Region II, USNRC.
Senior Resident Inspector, USNRC, Turkey Point Plant

L-2020-111 Attachment

**Response to Request for Additional Information Regarding
Unit 4 Steam Generator Tube Inspection Report**

Background:

By letter dated September 25, 2019 (Agencywide Documents Access and Management System Accession No. ML19268B738), Florida Power & Light Company (FPL) submitted information summarizing the results of the spring 2019 steam generator (SG) inspections performed at Turkey Point Nuclear Generating Unit 4. These inspections were performed during refueling outage (RFO) 31. Technical Specification (TS) Section 6.9.1.8 requires that a report be submitted within 180 days after the initial entry into hot shutdown (MODE 4) following completion of an inspection of the SGs performed in accordance with TS Section 6.8.4.j, which requires that a SG Program be established and implemented to ensure SG tube integrity is maintained.

To complete its review of the inspection report, the U.S. Nuclear Regulatory Commission staff requests the following additional information:

NRC RAI #1:

Tube R38C58 in SG-B was plugged due to atypical anti-vibration bar (AVB) wear growth rate history. FPL reported indication growth rates of 8 percent and 10 percent through-wall at two AVB locations over the last two operating cycles.

Provide any details on what may have contributed to the atypical AVB wear growth rates. In addition, compare the observed AVB wear growth rates for this tube with the 95th percentile AVB wear growth rate assumed in the Cycles 29 and 30 operational assessment; and discuss whether FPL adjusted the projected AVB wear growth rates for the upcoming operating period.

FPL Response for RAI #1:

During condition monitoring (CM), the Turkey Point SG program reviews the historical depth data including performing lookbacks to identify indications that may show increasing trends in wear rates that are not typical of the population of in-service indications. Atypical AVB wear growth rates may be attributed to slight differences in flow characteristics for a specified tube compared to the rest of the tubes. No historical PLPs have been noted at or in the vicinity of the affected tube at the AVBs for this tube; thus, it is unlikely to be from a resident foreign object. Sometimes, higher-than-normal growth rates may be computed due to measurement uncertainties, which can affect the two "paired" depth sizes in an adverse way (i.e., an indication may be undersized at the previous inspection while oversized at the current inspection). The information gathered from a detailed historical review of the wear pattern on and around this tube in the AVB region of the bundle is inconclusive as to exactly what may have contributed to the atypical growth rates found.

For R38C58 in SG B, it was observed that the indications at AV3 and AV4 had notable depth increases in the two successive examinations (TP4-29 and TP4-31). This growth behavior was judged to be atypical, and the tube was flagged during the CM evaluation and removed from service as a preventive measure. It should be noted that the 8% and 10% are not growth *rates*, but are the growths (change in depths in %TW) between the

two successive SG exams. Now, the historical 95-50 growth rate for AVB support wear was determined to be 4.0%TW/EFY for the TP4-31 inspection. The computed growth rates for the two AVB wear indications in SG-B (tube R38C58) at TP4-31 were 2.9%TW/EFY and 3.7%TW/EFY, which are both less than the upper 95-50 growth rate. The growth rates for these indications fell within the lognormal distribution of all computed growth rates for the reported indications detected during the outage and did not impact the historical 95-50 value for the mechanism. Therefore, no adjustment was necessary for the TP4-31 operational assessment (OA).

NRC RAI #2:

A newly identified foreign object (FO) shaped like a button-head bolt was identified in SG-B that could not be removed because it was fixed in place between four adjacent tubes. FPL reported that the object appears to have been in place since the SG was manufactured. Dent signals, with no associated degradation just above the top of tubesheet, were reported for the four adjacent tubes.

Discuss whether the dent signals in the four adjacent tubes have been present since SG-B was placed into service or whether the dent signals were newly identified during RFO31. If there is a history of dent signals in the four adjacent tubes at those locations, then discuss whether there have been any historical possible loose part signals in those tubes at those locations.

FPL Response for RAI #2:

A review of available historical SG inspection data shows that dent or ding signals close to (within 3 inches above) the top of tubesheet (TTS) were first reported for the 4 tubes in question as follows: In EOC 13 (1993) for tubes R28C34, R29C34 and R29C35, and in EOC 24 (2009) for tube R28C35. Dents in all 4 adjacent tubes are located approximately 2-3 inches above the TTS. Since EOC 24, the dent signals have been reported in subsequent SG exams. An additional ding signal has also been reported in the tube at R29C34 at less than one inch above the TTS since EOC 24, but review of raw ECT data shows that the dent signal is discernable back to EOC 13. In TP4-31, the foreign object was visually confirmed by the secondary-side inspection team to be lying on the TTS. Based on the above information, it appears that the object might have previously been lodged within the 4 tubes a few inches above the TTS (prior to EOC 13) and had subsequently migrated to the TTS. A possible loose part (PLP) code was assigned for the first time on these tubes during the TP4-31 SG inspection. In accordance with the SGMP Integrity Assessment Guidelines, the location of this irretrievable foreign object will be revisited during future secondary-side exams, and the tubes that are 1-tube bounding of these tubes at the TTS will be included in future ECT special interest exams.

NRC RAI #3:

FPL reported that ultrasonic testing thickness measurements identified external wall thinning on the feedring in SG-B that appears to have been caused by impingement when feedwater discharges from the neighboring j-tube. FPL further stated that the external wall thinning of the feedring was entered in the corrective action program and that repairs were performed in RFO31.

Describe the repairs that were performed to address the external wall thinning of the feedring.

FPL Response for RAI #3:

The repairs completed to address the condition described consisted of adding a weld build-up (overlay) to the wall of the feedring in the affected area.