



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

February 3, 2017

Mr. Mano Nazar
President and Chief Nuclear Officer
Nuclear Division
Florida Power & Light Co.
Mail Stop: NT3/JW
15430 Endeavor Drive
Jupiter, FL 33478

SUBJECT: ST. LUCIE PLANT UNIT NO. 2 – REVIEW OF THE FALL 2015 STEAM
GENERATOR TUBE INSERVICE INSPECTION REPORT FOR REFUELING
OUTAGE 22 (CAC NO. MF7604)

Dear Mr. Nazar:

By letter dated April 15, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16111B235), Florida Power and Light Company (the licensee) submitted information summarizing the results of the fall 2015 steam generator tube inspections performed at St. Lucie Plant Unit 2. These inspections were performed during Refueling Outage 22 in accordance with Technical Specification (TS) Section 6.8.4.1. In addition to the above report, the licensee submitted clarifying information in an October 11, 2016, e-mail to the U.S. Nuclear Regulatory Commission (NRC) (ADAMS Accession No. ML17003A045).

The NRC staff has completed its review of these submittals and concludes that the licensee provided the information required by its TSs and that no additional followup is required at this time. The NRC staff's review of the report is enclosed.

Sincerely,

A handwritten signature in black ink, appearing to read "Perry H. Buckberg".

Perry H. Buckberg, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-389

Enclosure:
Inspection Summary Report

cc w/encl: Distribution via ListServ

REVIEW OF THE 2015 STEAM GENERATOR TUBE

INSERVICE INSPECTION REPORT

ST. LUCIE PLANT UNIT NO. 2

DOCKET NO. 50-389

TAC NO. MF7604

By letter dated April 15, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16111B235), Florida Power & Light Company (the licensee) submitted information summarizing the results of the fall 2015 steam generator tube inspections performed at St. Lucie Plant Unit 2. These inspections were performed during Refueling Outage (RFO) 22. The licensee submitted clarifying information to the U.S. Nuclear Regulatory Commission (NRC) in an October 11, 2016, e-mail (ADAMS Accession No. ML17003A045).

St. Lucie Unit 2 has two Model 86/19TI replacement steam generators (SGs) that were manufactured by AREVA and installed in 2007. Each SG has 8,999 thermally treated Alloy 690 tubes with a nominal outside diameter of 0.75 inches and a nominal wall thickness of 0.043 inches. During manufacturing, all tubes were hydraulically expanded at both ends over the full depth of the tubesheet. The tubesheet was drilled on a triangular pitch with 1.0-inch spacing, center-to-center. The radius of the row 1 U-bends is 4.134 inches. The U-bends in rows 1 through 15 were stress relieved after bending. Seven Type 410 stainless steel tube support plates, each 1.181-inches thick with broached trefoil holes, support the vertical section of the tubes. Four sets of antivibration bars (AVBs), each 0.112 inches thick and made from Type 405 stainless steel, support the U-bend section of the tubes.

The licensee provided the scope, extent, methods, and results of their SG tube inspections in the April 15, 2016, inspection report. In addition, the licensee described corrective actions, such as tube plugging, taken in response to the inspection findings. The tubes in both SGs 2A and 2B were inspected during this refueling outage.

In the October 11, 2016, e-mail, the licensee confirmed the number of AVB and tube support plate wear indications identified in SGs 2A and 2B. The information provided by the licensee is summarized in the following table and clarifying notes:

Location	SG 2A		SG 2B	
	No. of Tubes	No. of Indications	No. of Tubes	No. of Indications
Anti-Vibration Bars	2672	9147	2010	5934
Tube Support Plates	130	165	128	152

Enclosure

Notes

1. The table summarizes the number of tubes and number of indications associated with anti-vibration bars and tube support plates. The listing of these indications is documented in appendices B, E, F, and G of the April 15, 2016, SG Tube Inspection Report.
2. The total number of tubes/indications associated with AVBs includes the tubes/indications with wear at AVB U-Bend Apex (AV4/5) locations (listed in Appendix E of the April 15, 2016, SG Tube Inspection Report).
 - a. Of the 22 tubes in SG 2A having U-Bend Apex (AV4/5) wear, 15 of them also had typical AVB wear elsewhere and are listed in Appendix G of the April 15, 2016, SG Tube Inspection Report.
 - b. Of the 9 tubes in SG 2B having AVB U-Bend Apex (AV4/5) wear, 5 of them also had typical AVB wear elsewhere and are listed in Appendix G of the April 15, 2016, SG Tube Inspection Report.
3. In a letter dated June 18, 2015 (ADAMS Accession No. ML15190A336) related to the St. Lucie Unit 2 RFO 21 SG Tube Inspection Report, the licensee described wear at the SG U-Bend Apex (AV4/5) locations. To date, wear at these locations has only been identified in row- 69 tubes.

Based on its review of the April 15, 2016, SG Tube Inspection Report, the U.S. Nuclear Regulatory Commission staff has the following observations and comments:

- During inspection of the SG 2B feeding, the inner support brackets were found to be slightly deformed. The brackets were part of a new design that was installed during RFO 21 in 2014. The support brackets appear to have been displaced by a pressure transient in the feeding during the last operating cycle. All welds were noted to be intact. The condition was documented in the corrective action program, and the brackets were repaired by attaching support braces/stiffeners to them. No deficiency was observed with the SG 2A feeding and supports.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by its technical specifications. In addition, the staff concludes 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. Further, the staff concludes that inspection results appear to be consistent with industry operating experience at similarly designed and operated units. Although the number of wear indications is greater than the number of wear indications found at other AREVA SGs of similar age, the depths of these indications (i.e., the severity) are comparable to those observed at other plants.

SUBJECT: ST. LUCIE PLANT, UNIT NO. 2 – REVIEW OF THE FALL 2015 STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT FOR REFUELING OUTAGE 22 (CAC NO. MF7604) DATED FEBRUARY 3, 2017

DISTRIBUTION:

PUBLIC LPL2-2 R/F RidsACRS_MailCTR Resource AHuynh, NRR
 RidsNrrPMStLucie Resource RidsNrrDorlLpl2-2 Resource AJohnson, NRR
 RidsNrrLABClayton Resource RidsRgn2MailCenter Resource
 RidsNrrDeEsgb Resource

ADAMS Accession No.: ML17013A220

***by memo**

OFFICE	DORL/LPL2-2/PM	DORL/LPL2-2/LA	DE/ESGB/BC (A)*	DORL/LPL2-2/BC	DORL/LPL2-2/PM
NAME	PBuckberg	BClayton	EWong	BBeasley	PBuckberg
DATE	2/3/17	2/3/17	12/29/16	2/3/17	2/3/17

OFFICIAL AGENCY COPY