



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

August 10, 2021

Mr. Bob Coffey
Executive Vice President, Nuclear
and Chief Nuclear Officer
Florida Power & Light Company
NextEra Energy Seabrook, LLC
Mail Stop: EX/JB
700 Universe Blvd.
Juno Beach, FL 33408

SUBJECT: SEABROOK STATION, UNIT NO. 1 – REVIEW OF THE SPRING 2020 STEAM
GENERATOR TUBE INSPECTIONS (EPID L-2020-LRO-0066)

Dear Mr. Coffey:

By letter dated October 20, 2020, as supplemented by letter dated May 20, 2021 (Agencywide Documents Access and Management System Accession Nos. ML20295A551 and ML21140A307, respectively), NextEra Energy Seabrook, LLC (NextEra) submitted information summarizing the results of the spring 2020 steam generator inspections at Seabrook Station, Unit No. 1 (Seabrook). These inspections were performed during the 20th refueling outage.

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the information and determined that NextEra provided the information required by the Seabrook technical specifications. In addition, the NRC staff did not identify any technical issues that warrant followup action at this time. A summary of the NRC staff's review is enclosed.

If you have questions, you can contact me at 301-415-2048 and/or via e-mail at Justin.Poole@nrc.gov.

Sincerely,

/RA/

Justin C. Poole, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:
As stated

cc: Listserv

REVIEW OF THE SPRING 2020 STEAM GENERATOR TUBE INSPECTIONS

NEXTERA ENERGY SEABROOK, LLC.

SEABROOK STATION, UNIT NO. 1

DOCKET NO. 50-443

By letter dated October 20, 2020, as supplemented by letter dated May 20, 2021 (Agencywide Documents Access and Management System Accession Nos. ML20295A551 and ML21140A307, respectively), NextEra Energy Seabrook, LLC (NextEra, the licensee) submitted information summarizing the results of the spring 2020 steam generator (SG) inspections at Seabrook Station, Unit No. 1 (Seabrook). These inspections were performed during the 20th refueling outage.

Seabrook has four Westinghouse Model F SGs, each of which contains 5,626 thermally treated Alloy 600 tubes. Each tube has a nominal outside diameter of 0.688 inches and a nominal wall thickness of 0.040 inches. During SG fabrication, the tubes ends were hydraulically expanded over the full depth of the tubesheet. Eight horizontal stainless steel structures support the vertical section of the tubes. The lowest support is a flow distribution baffle with drilled holes. The other seven are tube support plates (TSPs) with broached quatrefoil holes. Chrome-plated Alloy 600 anti-vibration bars support the U-bend section of the tubes. The first 10 rows of tubes received a thermal stress-relief treatment to improve the corrosion resistance of the bend region.

The licensee provided the scope, extent, methods, and results of its SG tube inspections. The licensee also described corrective actions, such as tube plugging, taken in response to the inspection findings.

Based on the U.S. Nuclear Regulatory Commission (NRC) staff's review of the information submitted by the licensee, the NRC staff has the following observations/comments:

- Axial outside diameter stress corrosion cracking (ODSCC) was detected within dents at TSP intersections at the uppermost tube support plate (08) in SG B. Six of the cracks were detected in five tubes during the initial 50 percent sampling with the bobbin probe. Scope expansion to the remaining tubes in SG B resulted in detection of an additional nine cracks in six tubes, for a total of 15 crack indications detected in 11 tubes. Fourteen of the indications were on the hot leg and the other indication was at the uppermost cold leg support plate.
- The 11 tubes with ODSCC were plugged, and no in-situ testing was required.
- The tubes with crack indications were not in the population of tubes with high residual stress.
- The licensee identified the following lessons learned regarding the detection of cracking at locations with both geometric changes (such as dents) and eddy current signals that can mask flaws: (1) use the earliest available +Point™ probe data for historical

comparison, (2) ensure analysts are trained to recognize complex low-level signals, and (3) analysts should use multiple channels to analyze dent signals at structures.

- The licensee is incorporating these lessons learned into site-specific analyst performance demonstrations for future inspections at Seabrook. In addition, the licensee shared the eddy current data with industry for awareness and training at other plants.
- The licensee discussed the importance of using multiple probe types to investigate the eddy current signals at dents. The NRC staff supports the approach of performing enhanced inspections with both rotating and array probes to help diagnose complex eddy current signals (e.g., local changes to the tube geometry).
- Four tubes in SG C were plugged and stabilized. Two of these tubes contained foreign object wear indications and the other two nearby tubes had possible loose part signals. The maximum wear depth was 13 percent through wall.
- An anomaly was identified in the stainless-steel cladding in the cold leg channel head in SG B, 22 inches from the divider plate and 6 inches below the tubesheet. Review of previous video inspection results found an anomaly discernable at the same location as far back as the 17th refueling outage inspection in Fall 2015. An engineering evaluation concluded the anomaly would not result in exposure of the base metal during the 60-year operating life of the plant.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by the Seabrook technical specifications. In addition, the NRC staff concludes that there are no technical issues that warrant followup action at this time, since 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.

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DATED AUGUST 10, 2021

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*via memo

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