



APR 16 2015

L-2015-122
10 CFR 50.36

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

Re: Turkey Point Unit 3
Docket No. 50-250
Response to Request for Additional Information Regarding
Steam Generator Tube Inspection Report

Reference:

1. FPL letter, L-2014-293, "Turkey Point Unit 3, Docket No. 50-250, Steam Generator Tube Inspection Report," October 6, 2014.
2. NRC to FPL, "Request for Additional Information – Turkey Point 3 Steam Generator Tube Inspection Report," February 20, 2015

By letter dated October 6, 2014, Florida Power & Light Company (FPL) submitted the Turkey Point Unit 3 Cycle 27 Refueling Outage Steam Generator Tube Inspection Report (Reference 1). (ML14302A079)

On February 20, 2015, the NRC requested additional information regarding Reference 1. The enclosure to this letter provides FPL's response to the request for additional information (Reference 2). (ML15054A406)

Should there be any questions, please contact Mitch Guth at (305) 246-6698.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Kiley'.

Michael Kiley
Vice President
Turkey Point Nuclear Plant

Attachment

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

A001
NRR

L-2015-122 ENCLOSURE

**Response to Request for Additional Information Regarding
Unit 3 Steam Generator Tube Inspection Report**

Response to Request for Additional Information

Note: The following outage designators are used in the RAI responses below:

“TP3-27” refers to the Turkey Point Unit 3 Cycle 27 Refueling Outage at the End of Cycle 26 (EOC-26) in 2014.

“TP3-25” refers to the Turkey Point Unit 3 Cycle 25 Refueling Outage at the End of Cycle 24 (EOC-24) in 2010.

“TP3-23” refers to the Turkey Point Unit 3 Cycle 23 Refueling Outage at the End of Cycle 22 (EOC-22) in 2007.

“TP3-21” refers to the Turkey Point Unit 3 Cycle 21 Refueling Outage at the End of Cycle 20 (EOC-20) in 2004.

RAI-1

Please describe the results of the following: plug visual inspections, supplementary primary side inspections to address Westinghouse NSAL 12-01, and the secondary side inspection and cleaning.

FPL Response:

Plug Visual Inspections

Prior to starting the eddy current examination at TP3-27, all of the previously installed hot-leg and cold-leg plugs in all three steam generators were confirmed to be present in their correct locations and were confirmed to be free from degradation and visible signs of leakage based on the visual examination.

Westinghouse NSAL 12-01 Visual Inspection

The channel head bowls of the 3A, 3B, and 3C steam generators were visually scanned to address the Westinghouse NSAL 12-01 letter. No degradation was observed in any of the three SG channel heads. The visual examination of the 3B and 3C steam generators was performed in a dry bowl condition. Not all areas of the 3A steam generator bowl were in a dry condition during the inspection, so the visual examination of the 3A bowl was done to the extent possible.

Secondary Side Inspection and Cleaning

Secondary Side Inspections (SSI) during the TP3-27 refueling outage (RFO) included the following in all three steam generators:

- Upper Bundle Flush (UBF)
- Sludge Lance
- FOSAR (Foreign Object Search and Retrieval).

The UBF and sludge lancing processes resulted in the removal of the following amounts of sludge:

- 72 lbs of sludge from SG 3A,
- 78 lbs of sludge from SG 3B, and
- 97 lbs of sludge from SG 3C.

Post sludge lancing FOSAR was performed in all three steam generators. Several newly-identified foreign objects were reported during FOSAR, and all of those objects were retrieved. In addition to the FOSAR, primary side eddy current inspections using the rotating +Point™ coil were performed on all periphery tubes at the top-of-tubesheet locations (in the hot leg and cold leg of all three SGs). There was no degradation associated with any of the retrieved foreign objects. Several historical foreign objects that cannot be removed (including sludge scale or hardened sludge fragments) are tracked at each inspection. All foreign objects remaining in the steam generators are being tracked, and the integrity of the steam generators until the next scheduled inspection is not affected. Foreign objects removed from the steam generators during FOSAR examinations are entered into the plant's Corrective Action Program (CAP) for tracking.

Upper Steam Drum Inspections were also performed in one SG (SG 3B). The upper internal components inspected included primary separators, secondary separator perforated plates, drain pipes, feeding J-Nozzles and general areas, as industry experience dictates.

During TP3-27, the feeding in SG B was visually inspected (internally) at all J-Nozzle locations (J-Nozzles are also referred to as J-Tubes). During the visual examination, some slight erosion was observed around the J-Nozzle bore holes (on the inside surface of the feeding). The condition was originally reported to the NRC on January 10, 2008 via FPL Licensing Letter L-2008-003 "Turkey Point Unit 3 Docket No. 50-250 Inservice Inspection Report" (ADAMS Accession No. ML080220439). No other abnormalities were noted during the upper steam drum inspection in SG 3B.

RAI-2

Please discuss whether any degradation of the feedwater ring has been observed. A letter dated January 10, 2008 (ADAMS Accession No. ML080220439) implies degradation has been observed, but a letter dated January 30, 2009 (ADAMS Accession No. ML090570046) implies there is no degradation.

FPL Response:

As part of the ISI Program, the SG feeding J-tubes were inspected during the TP3-23 outage in 2007. During the TP3-23 examination in 2007, some slight erosion was observed on the inside of the feeding at the J-tube interface. This was described as "flow induced undercut" in the 2007 Inservice Inspection report (ADAMS Accession No. ML080220439). The report states, in part:

"slight undercut was observed around the inside radius of the J-nozzle weld (Flow induced undercut). Also erosion observed on the feeding where the flow comes out of the J-nozzles."

Based on the most recent SG secondary side inspection (TP3-27) in 2014, the inside of the feeding in SG B was visually inspected at all J-tube interface areas. Some slight erosion was noted close to the J-tube to feeding interface. This condition has been observed during the TP3-23 inspection in 2007 (noted as "flow induced undercut"), and reported to the NRC as part of the ISI Program inspection (ADAMS Accession No. ML080220439). Inspections of feeding

equipment have been conducted during scheduled secondary side inspections since 1991. Routine monitoring includes visual inspection within the feedring piping at the J-tube junctions per the Westinghouse Technical Bulletin, NSD-TB-94-03. In addition, ultrasonic testing (UT) is performed at selected locations on the feedring to monitor for erosion. Based on the most recent inspections (2014), the "flow induced undercut" condition noted in TP3-23 in 2007 does not appear to have changed over time.

With regard to the "erosion observed on the feedring" (as stated in the TP3-23 ISI Inspection Report; ADAMS Accession No. ML080220439), review of historical inspection results and photos revealed that what appeared to be erosion was a discoloration of the feedring piping due to the impingement of the feedwater leaving the J-tubes. To clarify, the J-tubes are designed to discharge feedwater onto the feedring piping. Over time, the continuous flow of feedwater onto the feedring piping causes a normal discoloration of the feedring surface that looks different from other areas of the feedring where feedwater is not discharged.

On January 30, 2009, FPL provided the following response (ADAMS Accession No. ML090570046) to an NRC RAI (ADAMS Accession No. ML083430607) on the scope and results of any secondary side inspections:

"The steam drum area was inspected in SG 3B. This included visual inspections of the steam separation equipment, feedring, j-tubes and j-tube bore holes. Ultrasonic inspections of the feedring and feedring distribution box were also performed with no abnormal conditions or degradation reported."

Based on a review of historical records, it was noted that the 2007 findings (described above) of the ISI Program SG inspection were not translated to the documented SG secondary side inspection results, and were not included in the January 2009 FPL response to the RAI (ADAMS Accession No. ML090570046). The discrepancy between the documented historical and current results has been entered in the corrective action program.

RAI-3

Please describe how it was determined that there was no degradation in the tube with the permeability variation (row 23, column 71) in SG B.

FPL Response:

The permeability variation in row 23, column 71 has been recorded with the bobbin coil at every inspection since 1995 (nine inspections total from 1995-2014) with no significant change in signal characteristics. During the TP3-27 inspection in 2014, the location was also tested with a magnetically-biased rotating +Point™ coil, which did not identify any degradation at that location. The tube was plugged as a preventative measure only.

RAI-4

One axial indication was reported near a hot leg tube end in SG B. Was this indication attributed to primary water stress corrosion cracking?

FPL Response:

Based on the rotating +Point™ coil data and the location of the indication (TSH- 21.92"), the indication is most likely attributed to PWSCC. This indication was below the H* depth.

RAI-5

Please clarify the cause of the volumetric indication in the tube at row 3, column 43 in SG B. For example, is it wear attributed to a loose part?

FPL Response:

A possible loose part (PLP) was initially reported with eddy current during the TP3-21 inspection in 2004 and visually verified during that outage to be a hard sludge collar. The sludge collar was visually confirmed to be present through the TP3-25 inspection in 2010, and no degradation was ever reported with eddy current up through the TP3-25 inspection. Retrieval attempts for the sludge collar up through TP3-25 were unsuccessful. During the TP3-27 refueling outage in 2014, sludge lancing and visual examination were again performed. It was confirmed by the TP3-27 visual examination that the sludge collar was no longer present, most likely removed during the TP3-27 sludge lancing operations. A small wear indication was reported at the location where the sludge collar was previously located. Even though the sludge collar has been removed, there were still some slight sludge scale remnants coincident with the wear location. As a preventative measure, the tube was stabilized and plugged.

RAI-6

Please confirm that there were:

- a. 24 indications in 18 tubes in SG A with anti-vibration bar (AVB) wear;

FPL Response:

That is correct.

- b. 39 indications in 22 tubes in SG B with AVB wear;

FPL Response:

That is correct.

- c. 142 indications in 93 tubes in SG C with AVB wear;

FPL Response:

That is correct.

- d. 3 indications in 3 tubes in SG A with wear at broached tube support plates (TSPs);

FPL Response:

That is correct.

- e. 6 indications in 6 tubes in SG B with wear at broached TSPs;

FPL Response:

That is correct; there were a total of 6 wear indications attributed to broached support plates.

Of the six wear indications, there were 4 indications in 4 tubes with wear reported as "WAR" at broached TSP in SG B.

The affected tubes are shown below:

SG B R5 C87 WAR @ 03H-0.53"

SG B R21 C42 WAR @ 03C+0.57"

SG B R26 C41 WAR @ 03C+0.62"

SG B R33 C73 WAR @ 02H-0.66"

In addition, there were 2 indications in 2 tubes located slightly below the lower edge of the 02H broached support plate that were also attributed to broached TSP wear. Those indications were reported as "VOL", and are listed below:

SG B R5 C65 VOL @ 02H-0.84"

SG B R18 C80 VOL @ 02H-0.90".

- f. 11 indications in 11 tubes in SG C with wear at broached TSPs; and

FPL Response:

That is correct.

- g. 4 indications in 4 tubes in SG B with wear at the hot leg baffle plate.

FPL Response:

That is correct.