



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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January 19, 2011

Mr. Mano Nazar
Executive Vice President and
Chief Nuclear Officer
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

SUBJECT: TURKEY POINT UNIT 3 - SUMMARY OF OCTOBER 12, 2010, CONFERENCE
CALL REGARDING THE FALL 2010, STEAM GENERATOR INSPECTIONS
(TAC NO. ME4556)

Dear Mr. Nazar:

On October 12, 2010, the U.S. Nuclear Regulatory Commission staff participated in a conference call with Florida Power and Light (the licensee) regarding the ongoing steam generator (SG) tube inspection activities at Turkey Point Unit 3. In support of the conference call, the licensee provided Enclosure 1, Steam Generator Tube Inspection Discussion Points. Enclosure 2 is a summary of the October 12, 2010, SG tube inspection conference call.

Should you have any questions you can contact me at 301-415-5888.

Sincerely,

A handwritten signature in black ink, appearing to read "Jason C. Paige".

Jason C. Paige, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-250

Enclosures:

1. Steam Generator Tube Inspection Discussion Points
2. Summary of October 12, 2010 Conference Call

cc w/ encls: Distribution via Listserv

STEAM GENERATOR TUBE INSPECTION DISCUSSION POINTS

Turkey Point Unit 3 – October 2010

The following discussion points have been prepared to facilitate the conference call arranged with the licensee to discuss the results of the steam generator [SG] tube inspections to be conducted during the upcoming fall 2010, Turkey Point Unit 3 refueling outage. This conference call is scheduled to occur towards the end of the planned SG tube inspections, but before the unit completes the inspections and repairs.

1. Discuss any trends in the amount of primary-to-secondary leakage observed during the recently completed cycle.

Reply: There were no indications of primary to secondary leakage for Turkey Point Unit 3 during the previous operating cycle as evidenced by air removal system, and steam generator blowdown radiation monitoring readings and sampling.

2. Discuss whether any secondary side pressure tests were performed during the outage and the associated results.

Reply: No secondary side pressure tests for Turkey Point Unit 3 during the current outage.

3. Discuss any exceptions taken to the industry guidelines.

Reply: No exceptions or deviations are taken.

4. For each steam generator, provide a description of the inspections performed including the areas examined and the probes used (e.g., dents/dings, sleeves, expansion-transition, U-bends with a rotating probe), the scope of the inspection (e.g., 100% of dents/dings greater than 5 volts and a 20% sample between 2 and 5 volts), and the expansion criteria.

Reply: Please see Table 1. Most inspection samples shown in Table 1 are planned for 100% of the population. Therefore, potential expansion of inspections would be limited to the following +Point™ inspections:

- *If cracking is detected in the hot leg tubesheet inspections, the remainder of the hot leg tubesheet and a minimum 20% sample would be conducted in the cold leg of the affected SG(s)*
- *If cracking is detected in the row 1 or 2 u-bends, the remaining Row 1 & 2 u-bends and a minimum 20% sample would be conducted in next higher row u-bends in the affected SG(s)*
- *If cracking is detected in the hot leg or u-bend ding/dent inspections, the remaining ding/dents in the affected region and a minimum 20% sample would be conducted for cold leg dings/dents in the affected SG(s)*

In addition to the ECT [eddy current testing] examinations, the following examinations were performed during EOC [end-of-cycle] 24.

Visual examination of all tube plugs

Secondary Side Inspection

- Upper Bundle Flush
- Sludge Lance
- Foreign Object Search & Retrieval (FOSAR)
- Pre bundle flush 7th support visual
- Pre bundle flush steam drum and upper u-bend bundle visual

5. For each area examined (e.g., tube supports, dent/dings, sleeves, etc), provide a summary of the number of indications identified to-date for each degradation mode (e.g., number of circumferential primary water stress corrosion cracking indications at the expansion transition). For the most significant indications in each area, provide an estimate of the severity of the indication (e.g., provide the voltage, depth, and length of the indication). In particular, address whether tube integrity (structural and accident induced leakage integrity) was maintained during the previous operating cycle. In addition, discuss whether any location exhibited a degradation mode that had not previously been observed at this location at this unit (e.g., observed circumferential primary water stress corrosion cracking at the expansion transition for the first time at this unit).

Reply: No crack-like indications and no new degradation modes were detected. Please see the following Table for a summary of wear indications.

**Turkey Point Unit 3 Steam Generators
October 2010 - Indication Summary for Wear**

Area Examined	Degradation Mode	Indication Count	Max. Depth	Max. Voltage	Max. Length	Tube Integrity Maintained
AVBs (u-bend)	wear	175	37%	1.56v Bobbin	0.26"	Yes
Row 1-2 U-bends	see above line	none	none	none	none	Yes
Broach Supports	wear	16	40%	1.53v	0.43"	Yes
Flow Baffle	wear	4	20%	0.5v	0.28"	Yes
Dings/Dents	none	none	none	none	none	Yes
Top of Tubesheet	wear	1	8%	0.11v	0.30"	Yes
Tubesheet H* Region (to 17.28")	none	none	none	none	none	Yes
Non-expanded Tubes (9 were plugged)	none	none	none	none	none	Yes
Region Below H* (for tube sever)	none	none	none	none	none	Yes

6. Describe repair/plugging plans.

Reply: Tube plugging planned includes the following:

- 9 tubes that are not expanded through the depth of the tubesheet
- 1 tube – Broached TSP wear 40%
- 1 tube - AVB wear <40% (preventative)
- 3 tubes - Broached TSP wear with Possible Loose Part (preventative)

7. Describe in-situ pressure test and tube pull plans and results (as applicable and if available).

Reply: None planned or required.

8. Discuss the following regarding loose parts:

- what inspections are performed to detect loose parts

Reply: Secondary side visual inspections of the tubesheet no tube lane and periphery region, and selected inner bundle visuals to investigate known foreign objects and possible loose part (PLP) indications based on ECT analysis.

Reply: Center flow slot regions of tube supports in SG 3B.

- a description of any loose parts detected and their location within the SG (including the source or nature of the loose part, if known)

Reply: Please see Table 2

- if the loose parts were removed from the SG

Reply: Please see Table 2

- indications of tube damage associated with the loose parts

Reply: Two broached TSP indication measuring <20% were plugged due to the presence of a small foreign object coincident with the wear indication.

A wear indication measuring 8% and located about 3" above the tubesheet remains in service. A foreign object is suspected of causing the indication, but has never been present since the indication was initially detected approximately 10 years ago.

9. Discuss the scope and results of any secondary side inspection and maintenance activities (e.g., in-bundle visual inspections, feeding inspections, sludge lancing, assessing deposit loading, etc).

Reply: The secondary side maintenance activities during the current Turkey Point Unit 3 refueling outage include:

- a. An inspection of the secondary side u-bend region and center flow slot regions of tube supports in SG B. Findings include only a light coating of deposits. Deposit loading is considered light compared to similar vintage and design units and all flow holes in the supports remain open.*
- b. Upper bundle flushing of SG A, B, and C.*
- c. Sludge lancing of flow distribution baffle and top of tubesheet in SG A, B, and C.*
- d. Top of tubesheet inspections and foreign object retrieval.*

10. Discuss any unexpected or unusual results.

Reply: None

11. Provide the schedule for steam generator-related activities during the remainder of the current outage.

Reply: Steam generator ECT and tube plugging should be complete on 10/12/10. Secondary side maintenance and inspections should be completed by 10/15/10.

TABLE 1 - Basis for Tube Examination Samples

Technique	Examination Sample	Required or Supplemental	Basis	Potential Degradation
Bobbin	100% full length in rows 3 and higher. Row 1 & 2 examinations will be limited to the hot leg and cold leg straight sections.	Required	Degradation Assessment	Wear/ ODSCC
	Screening of 100% of dings \leq 5 volts in straight sections (verticals). This includes tubes with low-voltage u-bend offset (LVU) tubes per AREVA FDMS ¹¹	Required	Degradation Assessment	ODSCC
+Point™	50% of the hot leg tubesheet to the extent of TTS +3.00 to -17.28 inches. This includes minimum 50% sample of BLG & OXP indications within the TS. The hot leg full depth tubesheet examination includes one unexpanded tube in SG 3A, two unexpanded tubes in SG 3B, and five unexpanded tubes in SG 3C identified with previous NTE indications (No Tube Expansion) that will require a full tubesheet inspection from TEH to TSH +3.00 Inches. Note: Unexpanded tubes require plugging, based on LAR 241 ¹² to limit tubesheet inspection to a depth of 17.28".	Required Required	ENG CSI-2.2, Rev. 32, Checklist item 1.D., and the Degradation Assessment.	Foreign Object Wear PWSCC ODSCC
	All Hot Leg and Cold Leg Periphery Expansion Transitions - +3"-2" from top of tubesheet. 'Periphery Tubes' are defined as the two outer-most peripheral tubes exposed to the annulus, and all open row 1 and 2 tubes in columns 1-92.	Required	ENG CSI-2.2, Rev. 32, Checklist item 1.D., and the Degradation Assessment.	Foreign Object Wear
	Cold Leg full depth tubesheet: One unexpanded tube in SG 3B identified with previous NTE indications (No Tube Expansion) will require a full tubesheet inspection from TEC to TSC +3.00 Inches. Note: Unexpanded tubes require plugging, based on LAR 241 ¹² to limit tubesheet inspection to a depth of 17.28".	Required	ENG CSI-2.2, Rev. 32, Checklist item 1.D., and the Degradation Assessment.	PWSCC ODSCC
	Tight radius u-bends - -50% of row 1 and 2 (not inspected in prior inspection)	Required	Degradation Assessment.	PWSCC ODSCC
	50% of hot leg freespan dings > 5 volts between TSH and 06H +1.00" (not inspected in prior inspection)	Required	Degradation Assessment.	PWSCC ODSCC
	50% of u-bend dings (not inspected in prior inspection)	Required	Degradation Assessment.	PWSCC ODSCC
	50% of hot leg dents/dings at structures (not inspected in prior inspection)	Required	Degradation Assessment.	PWSCC ODSCC

NOTE: Existing degradation mechanisms are wear at anti-vibration bars, tube supports and the flow baffle.

TABLE 2 - Turkey Point Unit 3 SG Secondary Side Foreign Objects

SG	Description	Removed yes/no	Wear Due to Object yes/no
SGA	Cylindrical object embedded in sludge at TSH	No	No
SGA	Object embedded in sludge at TSH	No	No
SGA	Magnetic object at TSH	Yes	No
SGB*	Flake-shaped object at TSC	No	No
SGB*	Sludge Rock at TSH	No	No
SGB*	Hard sludge at TSH	No	No
SGB*	Rock-like object at TSH	No	No
SGB*	Possible slag at TSH	No	No
SGC	Hard deposit-like object at TSH	No	No
SGC	Tube Scale at TSH	No	No
SGC	Cylindrical object at TSH	Yes	No
SGC	Sludge rock at TSC	No	No
SGC	Piece of wire at TSH	Yes	No
SGC	Piece of wire at TSC	Yes	No
SGC	Hard sludge adhered to hot leg tubesheet	No	No

Objects remaining in the SG are evaluated for unit operation

* All objects listed for SGB are based on EOC22 (2007) objects that were not removed. Secondary side visual inspection in SGB is scheduled for October 13th.

SUMMARY OF CONFERENCE CALL WITH
TURKEY POINT UNIT 3
REGARDING THE FALL 2010 STEAM GENERATOR TUBE INSPECTION RESULTS
DOCKET NUMBER 50-250

On October 12, 2010, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with Florida Power and Light (the licensee) regarding the ongoing steam generator (SG) tube inspection activities at Turkey Point Unit 3.

Turkey Point Unit 3 has three Westinghouse Model 44F SGs. The SGs have tubes that were hydraulically expanded into the tubesheet. The tubes are supported by Type 405 stainless steel tube support plates with broached quatrefoil holes. The Unit 3 steam generators were placed into operation in 1982, and have thermally treated Alloy 600 tubing.

Additional clarifying information or information not included in the document provided by the licensee is summarized below:

- The licensee performed sludge lancing and reported that the sludge lance pressure was 3,000 pounds per square inch.
- The licensee reported that three tubes, with wear and a possible loose part indication at a broached tube support plate, were plugged since no qualified sizing technique exists for this degradation mechanism.
- AVB means anti-vibration bar. TSP means tube support plate. ECT means eddy current testing. TTS means top of tubesheet. ODSCC means outer diameter stress corrosion cracking. PWSCC means primary water stress corrosion cracking. TEH means tube end hot. TEC means tube end cold. TSH means tubesheet hot. TSC means tubesheet cold. EOC means end of cycle.

The NRC staff did not identify any issues that required follow-up action at this time, however, the staff asked to be notified in the event that any unusual conditions were detected during the remainder of the outage.

January 19, 2011

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/RA/

Jason C. Paige, Project Manager
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3. Steam Generator Tube Inspection Discussion Points
4. Summary of October 12, 2010 Conference Call

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*By memo

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