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January 30, 2009  
L-2009-022  
10 CFR 50.36

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

Re: Turkey Point Unit 3  
Docket No. 50-250  
Response to Request for Additional Information Regarding the  
2007 Steam Generator Tube Inspection (TAC NO. MD9234)

By letter L-2008-041, dated April 3, 2008, Florida Power & Light (FPL) submitted the Turkey Point Unit 3 steam generator tube inspection 180 day report pursuant to Technical Specification 6.8.4.j, Steam Generator (SG) Program, documenting the results of the Turkey Point Unit 3 End of Cycle 22 steam generator tube inspections performed between September 12 and September 19, 2007.

On December 11, 2008, the NRC issued a request for additional information regarding the referenced report. Attachment 1 documents FPL's response to the request for additional information.

Should there be any questions, please contact Robert J. Tomonto, Licensing Manager, at (305) 246-7327.

Sincerely,

William Jefferson, Jr.  
Vice President  
Turkey Point Nuclear Plant

OIH

Attachment

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

AODI  
MLR

**Response to NRC Request for Additional Information  
2007 Steam Generator Tube Inspections  
Turkey Point Nuclear Power Station, Unit 3  
Docket Number 50-250**

1. For each refueling outage since installation of the steam generators (SGs), please provide the cumulative effective full power months that the SGs have operated.

**FPL Response**

Please refer to the table below. The SGs were replaced at the end of Cycle 7 and the first ISI was at the end of Cycle 8. Therefore, the First Period started at the beginning of Cycle 9. The September 2007 inspection occurred at the end of Cycle 22.

	CY	Period EFPM	Cumm EFPM		CY	Period EFPM	Cumm EFPM		CY	Period EFPM	Cumm EFPM
First ISI	8	--	16.37		16	0.57	136.94		22	6.93	233.30
First Period	9	12.42	28.79		17	16.25	152.62		23	23.67	250.04
EOC-20	10	27.46	43.83		18	33.93	170.30		24	41.44	126.718.0
	11	43.16	59.53		19	49.64	186.01		25	57.88	284.24
	12	58.04	74.41		20	67.07	203.44		26	60.00	286.37
	13	73.08	89.45		21	80.85	217.22				
	14	88.02	104.39		22	90.00	226.37				
	15	103.92	120.29								
	16	120.00	136.37								

2. In several instances there are references to inspections performed during "TP3-21." Is TP3-21, your end of cycle (EOC) 20 inspections, which were performed in 2004? If TP3-21 refers to EOC 21 (2006), please clarify these statements since the NRC staff was not aware that any SG tube inspections were performed during that outage.

**FPL Response**

Yes, TP3-21 is the plant designation for the reactor core load for Cycle 21. Therefore, TP3-21 and EOC-20 both refer to the refueling outage performed in 2004.

3. Please confirm that there are only 8 tubes that are not expanded for the full length of the tubesheet on the hot-leg side of the steam generators and 1 tube that is not expanded for the full length of the tubesheet on the cold-leg side of the SGs.

FPL Response

There are a total of 8 tubes that are not expanded for the full length of the tubesheet on the hot-leg (1 in SG 3A, 2 in SG 3B and 5 in SG 3C). One of these tubes in SG 3B is also not expanded for the full length of the tubesheet on the cold-leg.

4. Please discuss the results of your tube plug exams. For example, was there any degradation noticed and were all tube plugs verified to be present?

FPL Response

All existing tube plugs were visually examined. There was no evidence of degradation and all tube plugs were verified present and in the correct locations.

5. In the report, “tube R20 C67 in SG 3C … was plugged for the outside diameter volumetric indication… this indication is considered to most likely be a result of manufacturing or installation and not service induced.” Please discuss how this conclusion was determined. Please also discuss if this indication was present in prior inspections. It was indicated that the volumetric indication within the hot-leg tubesheet met the initial screening and that subsequent profiling was done. Please clarify what was meant by this indication “met the initial screening.” Is the statement implying that since the indication met the initial screening it required profiling? If so, describe the screening criteria.

FPL Response

The volumetric indication in R20 C67 in SG 3C is considered manufacturing related because it is located on the OD surface of the tube between the tube and the tubesheet bore hole, and six inches below the top of the tubesheet. The tube-to-tubesheet joint is closed by hydraulic expansion through the entire depth of the tubesheet and, thus, is not exposed to the secondary side impurities that can cause corrosion degradation. This is the only such indication detected during the inspection of approximately 9,500 tubes, which supports the conclusion that it is manufacturing related. Prior to this inspection, this area of tubing within the tubesheet has been inspected only with bobbin probe techniques, which do not detect the indication. This inspection is the first time this region of the tubesheet was inspected with rotating +Point<sup>TM</sup> probes. Therefore, this inspection is the only inspection with a technique that is capable of detecting the indication.

Indications such as this are screened against conservative criteria for voltage and length to determine if structural or leakage margins may be challenged. If an indication exceeds the established criteria it is profiled to obtain detailed length and shape information that is used to calculate a burst pressure. Upon further review, this indication did not meet the initial screening

criteria and was electively profiled. The maximum length and voltage was 0.42 inches and 0.34 volts, and the calculated 95/50 burst pressure was 6980 psi. The indication is well below the structural limit and would not pose a threat to tube integrity. This tube was plugged as required by Plant Technical Specification 6.8.4.j.c.1 for degradation in the tubesheet.

6. Please describe the scope and results of any secondary side inspections. If any degradation was detected, discuss the extent of the degradation and the basis for not inspecting the other SGs. Also, please discuss the results of the foreign object search and retrieval and secondary side upper bundle flush. Include in this discussion the extent to which the quatrefoil-shaped holes are blocked.

FPL Response

Secondary side inspections were conducted in the upper bundle regions in the 3A SG prior to bundle flushing. A thin deposit layer was observed in the upper regions including the tubes, tube supports and other supporting structures. Deposit accumulation was considered light and all tube support flow holes observed were fully open. No abnormal conditions or degradation was observed in the upper regions.

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.

Table 1 provides the sludge weights removed from each SG.

Table 1 – Turkey Point Unit 3 Sludge Weights for September 2007		
SG 3A	SG 3B	SG 3C
27.5 LBS	34.5LBS	43.0 LBS

Visual inspection and foreign object search and retrieval (FOSAR) was conducted for the tubesheet region in all three SGs following upper bundle flushing and sludge lancing. These inspections were coordinated with primary side inspections to disposition potential loose parts detected by eddy current. No tube degradation was observed during the secondary side visual inspections.

Follow up inspections of known foreign objects determined that most were observed to be in the same locations as in the previous outage. Some of the objects observed during the previous

inspection were likely removed during sludge lancing and were not observed during the EOC 22 outage. When known foreign objects are not observed during two or more consecutive outages, the object is not actively tracked but the information is retained in the event it is observed in future inspections.

In addition to known objects from the prior outage, seven new objects were identified. Four of these objects were removed from the steam generators and are shown in the photos below. All objects remaining, or presumed to remain in the steam generators, are evaluated for adverse impact on steam generator operation and tracked during future inspections.

Eddy current testing of R7 C45 in SG 3B at the second cold leg support reported a small wear mark with a possible small object present. This location could not be visually inspected due to its location within the tube bundle. This indication was determined to be present as early as 1990, measured 12% through-wall in 2007 and has changed little in 17 years. All adjacent tubes were tested with the +Point™ probe and no additional wear was present. Based on the shallow measured depth, long service history without significant change and no evidence of wear on adjacent tubes, this tube remains in service for tracking during future examinations.

To summarize, all locations with visually confirmed foreign objects and locations with possible loose parts (PLP) were resolved by a combination of FOSAR and eddy current activities. Tubes with eddy current PLP indications were investigated by testing with the +Point™ probe and /or visual examinations to determine if a foreign object was present. Foreign objects were removed when possible or recorded for future tracking. All known foreign objects that could not be removed and remain in the steam generators are addressed by evaluation to support continued operation.

7. There is a statement on page 2 of 15 that volumetric wear due to foreign objects is also not active because the foreign objects are no longer present based on secondary side visual examinations. However, on page 10 of 15, it was indicated that one location (Row 7, Column 45 in SG 3B) had evidence of a possible loose part that could not be examined visually because of restricted access. Please confirm that this was the only location with a possible loose part indication that was not visually examined. If not, please describe the other locations and the basis for leaving the nearby tubes in service. In addition, please confirm that no other loose parts (based on visual examination) were left in the SGs. If loose parts were left in the steam generator, please confirm that an analysis was performed to evaluate the acceptability of leaving these parts in the SGs and provide the results of the analysis.

FPL Response

Row 7, Column 45 in SG 3B at the second cold leg support is the only location with a possible loose part remaining in place that was not visually inspected due to access limitations. As discussed in the reply to question 6, this tube remains in service based on the shallow measured depth, long service history without significant change and no evidence of wear on adjacent tubes.

A suspected piece of weld slag was reported by visual inspection in March 1997 in SG 3B between Rows 44-45 and Columns 40-42 on the hot leg tubesheet and was not retrievable. Wear degradation was detected by ECT on two of these tubes. All tubes bounding this object were plugged. Visual inspections since March 1997 have verified the part remains in its current location. Several small pieces of hard sludge or flakes were also observed in each of the SGs and were not retrieved. Such sludge remnants are typically present following sludge lancing. No tube damage has ever been associated with hard sludge pieces or flakes. An engineering evaluation was completed to address all known loose parts that remain in the SGs, including hard sludge pieces and flakes. Conservative wear calculations were completed for each item. The minimum estimated time for the limiting object to penetrate 40% through-wall is 4.9 years, which is significantly longer than the planned operating interval between inspections of approximately 3 years.

8. Previously in EOC 19, you indicated that:

None of the tubes in Units 3 or 4 exhibit the characteristic "Seabrook Offset" signature that would indicate they were improperly processed. A small number of tubes were identified for monitoring in future inspections as they had relatively low voltage offsets.

In addition, you indicated that new industry information was recently published with additional recommendations regarding Seabrook screening methods and that you were in the process of updating the screening results to ensure it conforms to the latest industry guidance. The results of this update were to be factored into future inspections. Please discuss the extent to which you have observed an eddy current offset in either the low row (stress relieved) tubes or the high row tubes. Please discuss the extent to which these tubes were inspected with a rotating probe at the expansion transition or at dents/dings. In addition, please discuss the results of the monitoring of the tubes with the "relatively low voltage offsets" as identified in EOC 19 (if these results were not superseded by the more recent screening methods).

FPL Response

Prior to the Turkey Point Unit 3 EOC 19 examination in October 2001, all EOC 18 bobbin data was screened to identify any tubes with a possible residual stress condition. Based on the screening, there were no abnormal tubes in Rows 1-8. In Rows 9-45, 18 tubes were identified with a u-bend offset of <2 volts and were assigned a low voltage u-bend (LVU) code for future tracking. These 18 tubes were reviewed during the EOC-19 outage for precursors of degradation and none were present.

In 2004, the industry provided new screening criteria to identify possible "signature tubes." The new criteria define a voltage offset less than -2 Sigma for both the hot and cold leg as a signature tube. FPL tracks and monitors both the tubes identified in the earlier screening effort and additional tubes identified using the new criteria. There are total of 59 signature tubes. All

signature tubes were reviewed during the EOC-20 and EOC-22 inspections. No signature tubes were found to have ODSCC or precursors to ODSCC during any of the examinations. Further, rotating probe inspections at EOC 22 included the top of tubesheet expansion transition region of all active hot leg tubes, 50% of hot leg freespan dings/dents greater than 5 volts, 50% of all hot leg dings/dents at tube supports and all dings/dents in the u-bends. No degradation was reported at these locations.

PHOTO 1 - SG 3A  
FLEX GASKET MATERIAL REMOVED

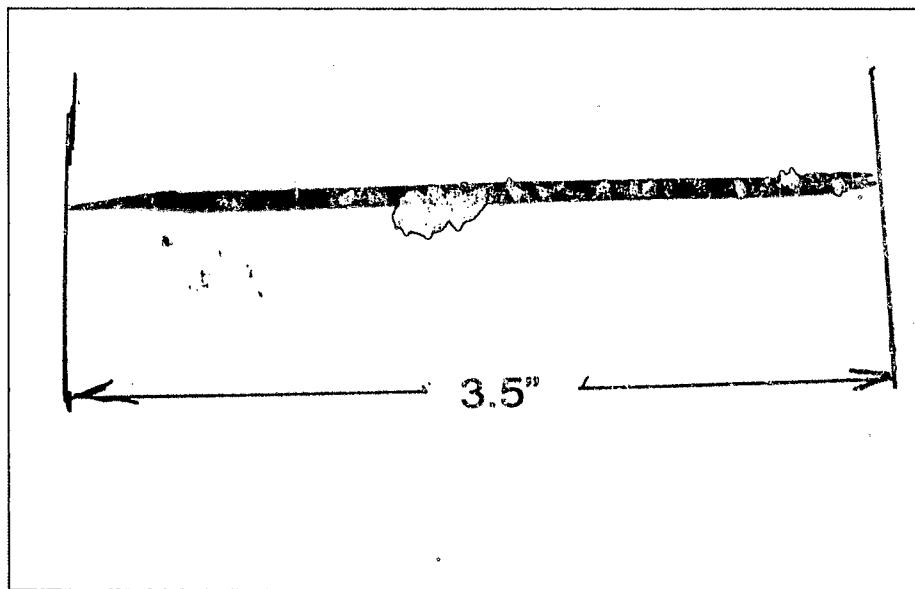


PHOTO 2 - SG 3C  
UNKNOWN FOREIGN MATERIAL REMOVED

