

April 5, 2002

Mr. J. A. Stall
Senior Vice President, Nuclear and
Chief Nuclear Officer
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

SUBJECT: TURKEY POINT PLANT, UNIT 3 - SUMMARY OF TELEPHONE CONFERENCE
CALLS REGARDING THE FALL 2001 STEAM GENERATOR INSPECTION
RESULTS AT TURKEY POINT PLANT, UNIT 3 (TAC NO. MB3025)

Dear Mr. Stall:

On October 11 and 12, 2001, the U.S. Nuclear Regulatory Commission (NRC) staff held telephone conference calls with Florida Power and Light Company (FPL or the licensee) representatives regarding the fall 2001 steam generator inspection activities at Turkey Point Plant, Unit 3 (TP3). The NRC staff documented its request and suggested agenda for the telephone conference in a letter to FPL dated September 26, 2001 (Agency Documents Access and Management System Accession No. ML012690632).

Topics discussed during the conference call consisted of: initial eddy current testing scope, scope expansion plans, indications identified to-date, repair/plugging plans, new inspection findings, in situ pressure test plans and actions taken in response to lessons learned from the Indian Point Unit 2 tube failure. The majority of the details discussed are contained in the enclosed document regarding FPL's TP3 Steam Generator Inspection Results provided by FPL in support of the conference calls.

At the time of the first call, FPL had identified three tube wear indications in regions close to the lower tube support plate (TSP). The bobbin inspection scope was thus expanded from 50 percent to 100 percent of the tubes. Due to the expansion, the staff requested to set up a follow-up call the next day when most of the inspection results would become available.

At the time of the second call, more than 70 percent of the inspection was completed. A total of eleven wear indications were detected by bobbin probe at the lower TSPs ranging from 31 percent to 57 percent through-wall. These indications were further examined using plus point probes. Sizing by plus point ranged from 19 percent to 51 percent through-wall. The lengths of the indications ranged from 0.12- to 0.25-inch.

Before the bobbin scope expansion, the licensee found three wear indications at the third cold-leg TSP. These indications prompted a review of the prior inspection data of those tube locations. Upon review of the prior inspection data (1998), it was discovered that one of the locations showed signs of wear in 1998. Although the signal was identified by the primary and secondary analysts in 1998, the signal was not obvious at that time and was classified as non-reportable by the resolution analysts. As a result of these findings, the licensee

subsequently re-examined all similar calls made in 1998 and did not identify any more indications from the previous inspection. A total of eleven indications were reported after the completion of the inspection. [Note: A more extensive historical review was completed after the inspection that showed seven of these indications were present in prior inspections, some as far back as 1990 or 1992, and only four were new in the 2001 inspection.]

FPL representatives stated that all tubes with this type of indication would be plugged if confirmed with a plus point probe due to uncertainties with the growth rate. The licensee speculated that three of the indications on the cold-leg side may have been caused by loose parts. However, the mechanism of all the wear indications, including the three in the cold leg, were still under evaluation.

A possible loose part was detected by eddy current in steam generator 3B. There was no related tube damage. This location is unaccessible for visual inspection or retrieval. The licensee does not believe that the loose parts would pose any threat to tube integrity, but stated that they will closely monitor the affected area in future inspections for potential degradation.

Additional visual inspections of the inner bundle region in steam generator 3C found several small objects (i.e., small wires, scale deposits) on the hot-leg side of the tubesheet. However, the location does not accommodate retrieval. Bobbin and plus point examinations of this region did not show any tube damage. The licensee planned to evaluate this issue to determine the impact on plant operation.

During the TP3 steam generator tube inspection in March, 2000, the first major rotating probe inspection of the hot-leg top of tubesheet region was performed. The rotating probe was equipped with a plus-point coil. As a result of these inspections, 64 tubes with indications near the top of the tubesheet on the hot-leg side were plugged. The indications were circumferential and volumetric in nature. All of the volumetric indications initiated from the outside diameter (OD) of the tube; whereas, the circumferential indications either initiated from the inside diameter (ID) or the OD of the tube. At the completion of the outage, investigations were still on-going as to the nature of these indications; however, they were believed to be a result of either corrosion degradation, original fabrication of the steam generator, or artifacts from the inspection technique. These indications were plugged on detection since the nature of the indications was in question (i.e., based on reviews performed during the outage the nature of these indications was still inconclusive) and a qualified depth sizing technique was not available.

Following the March 2000 outage, other eddy current data analysis experts were consulted and an assessment of industry experience with thermally treated alloy 600 was completed. The results from these activities led the licensee to conclude that most of the 64 indications were a result of steam generator fabrication or the inspection technique (e.g., probe liftoff). More specifically, the ID circumferential indications were believed to be a result of the inspection technique (i.e., geometry/probe liftoff) and the OD circumferential indications were re-classified as either volumetric/pit-like indications, geometry indications, or other non-flaw-like indications (e.g., dings/dents). In other words, some of these re-classified OD circumferential indications were attributed to steam generator fabrication and some were attributed to a "wall-loss" mechanism. For those attributed to wall loss, the licensee could not conclusively rule out volumetric corrosion degradation. The eddy current data analysis techniques were modified as a result of these activities.

In October 2000, Turkey Point Unit 4 (TP4) steam generator tube inspections were performed. As was the case for TP3 in March 2000, this was the first time extensive rotating probe inspections of the hot-leg top of tubesheet region were performed. During these inspections at the hot-leg top of tubesheet region, one volumetric indication (OD initiated) was detected and 6 volumetric/pit-like indications (OD initiated) were detected. Ultrasonic testing (UT) was performed on a sample of these seven indications and confirmed them as degradation. The licensee speculated that one of these seven indications may be due to loose parts since the indication was more axial in nature than volumetric based on the UT results. The tubes with these seven indications were plugged. In addition to these 7 indications, 24 geometric anomalies in 23 tubes were reported. All of these indications were ID initiated and circumferential in nature similar to the ID circumferential indications observed at TP3 in March 2000. UT was performed on a sample of these 24 indications. The evaluation of the UT results indicated that the eddy current indications were a result of "geometry" rather than degradation (i.e., the indications were either fabrication related or attributed to probe liftoff).

In October 2001, rotating probe inspections were performed in the hot-leg top of tubesheet region in approximately 50 percent of the tubes at TP3. No reportable indications were detected at the hot-leg top of tubesheet as a result of these inspections; however, as discussed above, eleven tubes with indications at the TSPs were discovered and plugged.

In summary, the volumetric, pit-like indications (some of which were OD circumferential indications re-classified as volumetric indications following the TP3 2000 inspections) are attributed to wall loss, and a volumetric corrosion mechanism could not be conclusively ruled out. The licensee indicated that similar indications would continue to be plugged upon detection during future inspections. The ID circumferential indications identified at TP3 and TP4 are attributed to geometry anomalies, and similar signals identified in the future would be left in service. During the 2001 TP3 outage, no new "geometry anomalies" or "volumetric/pit-like" indications were identified. These findings support the licensee's current conclusion that indications previously classified as ID circumferential indications and reclassified as geometry anomalies were not service induced.

The staff did not identify any other issue that requires further discussion. If you have any comments regarding this matter, please contact me at (301) 415-1496.

Sincerely,

/RA/

Kahtan N. Jabbour, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-250

Enclosure: FPL's TP3 Steam Generator Inspection Results

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