

**FPL / NRC TELECON - 9 am 10/11/01**  
**Turkey Point Unit 3 Steam Generator Inspection**

- Inspection Status
  - Original Program Near Complete
  - Decision to Expand Bobbin Inspection to 100% in 3 S/Gs
- Plus Point Inspection Results
  - 50% Top of Tubesheet                      No Reportable Indications
  - 50% Row 1 & 2 U-Bends                      No Reportable Indications
  - 30% of HL Dents                              No Reportable Indications
- Bobbin Test Results - 50% Full Length
  - Maximum AVB Wear is 34% - Growth Rates as Expected
  - 3 Wear Indications Detected at Lower Tube Support Plates
    - Cause of Wear Under Investigation
    - Bobbin Depths are 31% to 57%
    - Bobbin Volts are 0.5 to 2.5
    - 2 Not Present In Last Inspection (1998)
    - 1 Present but much Smaller & not Reportable
- Program Expansion
  - Bobbin Testing
    - Row 5 & Greater - 100% Full Length
    - Row 1 thru 4 - Hot & Cold Leg Straight Lengths
  - In Situ Pressure Test Based on Tube Integrity Assessment Evaluation
  - Expected Completion Estimated for Saturday

## NRC/FPL TELECONFERENCE – OCTOBER 12, 2001

### Turkey Point Unit 3 Steam Generator Tube Inspection Results

Licensees' steam generator (SG) tube eddy current (EC) inspections play a vital role in the management of SG tube degradation. The results are used to demonstrate adequate structural and leakage integrity of the SG tubes. NRC staff is interested in discussing the licensee's steam generator inspection plans and results, although the licensee is not required to participate in this discussion.

In addition to the traditional areas of discussion listed below, the staff is also interested in having the licensee discuss and describe any actions taken in response to the Indian Point 2 lessons learned.

Typical areas of discussion include:

1. Primary to secondary leakage prior to shutdown

*Response – Less than detectable.*

2. Results of secondary side hydro

*Response – N/A*

3. For each steam generator, a general description of areas examined; include expansion criteria and specify type of probe used in each area

Examination Status as of 0400 Hours on 10/12/01				
Probe Type	Examination Scope & Area	% Complete		
		SG A	SG B	SG C
Bobbin	100% Full Length <sup>(1)</sup>	94	90	95
Plus Point	50% of Hot Leg Top of Tubesheet	100	85	100
Plus Point	50% of Row 1&2 U-bends	99	66	100
Plus Point	30% of Hot Leg Dents	100	100	100

1. *The Bobbin examination scope was expanded from 50% to 100% in all S/Gs due to wear indications detected at the lower tube support plates.*

*Expansion criteria are in accordance with Plant Technical Specifications and NEI 97-06, Steam Generator Program Guidelines (i.e., EPRI S/G Examination Guidelines).*

4. For analyzed EC results, describe bobbin indications (those not examined with RPC) and RPC/Plus Point/Cecco indications. Include the following information: location, number, degradation mode, disposition, and voltages/depths/lengths of most significant indications.

*This information will be addressed during the teleconference.*

5. Description of repair/plugging plans

*Response – Mechanical wear at anti-vibration bars in the u-bend will be depth sized and plugged based on the plugging limit in the Technical Specifications. Mechanical wear at tube support plates will be plugged on detection for this inspection. At this time, we plan to plug one tube for AVB wear and 11 tubes for wear at tube supports. Suspected corrosion indications will be plugged on detection without regard to depth.*

6. Discussion of previous history: "look backs" performed; consideration of similar plants experiences

*Response –*

*Non-relevant indications (i.e., manufacturing buff marks) are reviewed against prior inspection results for evidence of change and examined with Plus Point probes if change is evident. No such examinations were required to date. Experience at similar Model F plants is addressed by the planned examinations.*

*History reviews for wear indications at tube support plates (TSP) determined that two were not present in the prior bobbin inspection (1998). A third indication was present but much smaller in amplitude. This indication was dispositioned in 1998 by resolution as not reportable in accordance with data analysis guidelines since it was not present on any alternate data channel. Additional reviews and examinations were completed for indications that met the conditions of this indication. As a result, eight additional bobbin indications were confirmed as wear damage by Plus Point techniques to date.*

7. Discussion of new inspection findings, including loose parts indications

*Response – New inspection findings are limited to eleven wear indications at the lower TSPs. These indications will be plugged based on confirmation with Plus Point techniques due to uncertainty associated with the growth rate. Three of the indications were located at the 3<sup>rd</sup> TSP on the cold leg of the 3B S/G and may be associated with a loose part. This location was not possible to inspect visually.*

*A possible loose part was detected by ECT in the 3B S/G. No tube damage was present, and a visual inspection was not possible for this location. This location will be tracked and examined in future inspections for potential degradation.*

*No loose parts were detected during sludge lance and FOSAR of the blowdown lane and annulus. Additional visual inspections of the inner bundle regions for the 3C S/G hot leg tubesheet shows several small objects are present (i.e., small wires, scale deposits), but are in locations that do not accommodate retrieval. Bobbin and Plus Point examination of 100% of tubes in this region did not show any tube damage. The small objects observed will be addressed by engineering evaluation to determine their impact on plant operation.*

8. Description of in-situ pressure test plans and results; include tube selection criteria, test pressure plans, test configuration

*Response – No indications in this inspection require in situ pressure testing to demonstrate that tube integrity was maintained during the prior operating cycle. Integrity assessment for the limiting TSP wear indication resulted in a calculated burst pressure of approximately 5400 psi. This compares to the performance criteria of 4542 psi (3xNODP). The calculated leakage at MSLB conditions was zero gpm. Test candidates are screened in accordance with latest industry guidance. In addition, burst pressures and leakage rates will be calculated based on flaw profiles generated with Plus Point probe data. Test pressures are developed to meet the tube integrity performance criteria of NEI 97-06, Steam Generator Program Guidelines. Test configuration will utilize the Westinghouse (formerly ABB/CE) test tooling with capability for local and full tube testing.*

9. Describe tube pull plans and preliminary results; include tube selection criteria and evaluation plans

*Response – There are no plans for a tube pull in this refueling outage.*

10. Assessment of tube integrity for previous operating cycle

*Response – Tube integrity assessment for this inspection demonstrates that all tubes met the tube integrity performance criteria of NEI 97-06, Steam Generator Program Guidelines for Cycle 18.*

11. Assessment of tube integrity for next operating cycle

*Response – Preliminary Operational Assessment results indicate there are no issues that would appear to challenge tube integrity assessment for Cycle 19 operation.*

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

*Response – Steam generator inspections should be completed by October 13, 2001.*

13. Discuss what steps have been taken, or will be taken, in response to the lessons learned from the Indian Point Unit 2 tube failure.

*Response - FPL has participated in NEI/NRC meetings on this subject. On average, low row u-bend noise at Turkey Point has been determined to be less than noise levels encountered at IP-2, and less than those encountered with the EPRI qualification data set for low row u-bend technique qualification. Therefore, site-specific validation of EPRI techniques is considered appropriate for low row u-bend inspection at Turkey Point. Tubes that exceed the average value of the EPRI sample set receive additional review by lead analysis personnel. This review may include use of additional noise minimization techniques (i.e., filtering) and/or re-examined as appropriate. High frequency techniques are considered in the event that OD deposits result in higher than expected noise levels.*

In addition, please be prepared to discuss the following:

- a) Discuss the actions that are taken in response to identifying a new degradation mechanism, and

*Response – No new degradation modes were encountered in this inspection. A new degradation mechanism would be entered into the Plant Corrective Action System for appropriate evaluation and corrective measures. Corrective action would include appropriate expansion criteria, additional training and re-analysis if necessary, and the use*

of "diagnostic examinations" to ensure potential degradation is understood and appropriately addressed.

- b) Discuss the actions taken to ensure that data noise levels are acceptable, and

*Response – Conditions at Turkey Point include essentially no copper in the feed train and drawn Alloy 600 Thermally Treated tubing. These conditions result in comparably low noise levels compared to EPRI sample sets used for technique qualification. Turkey Point examination data has been reviewed against the EPRI sample set data to ensure that the use of the techniques is appropriate (i.e., site-specific validation). Guidance on data quality and noise levels is provided in FPL data analysis guidelines, and an independent Qualified Data Analyst samples the examination data to ensure that data quality is acceptable.*

*Low row u-bend that contain isolated and discrete ID indications are considered for preventative plugging based on recent experience in Westinghouse and Combustion Engineering design steam generators.*

- c) Address data quality issues and the need for criteria to address data quality."

*Response – As required by Industry guidance, data quality issues are addressed through site specific validation of techniques that are used for inspection at Turkey Point. Guidance on data quality and noise levels is also provided in FPL data analysis guidelines. Further, an independent Qualified Data Analyst samples Turkey Point examination data to ensure that data quality is acceptable.*

**Note:** It may facilitate the discussion of the licensee provides details on the topics listed above prior to the conference call (e.g., simple tables and figures).