May 23, 2002

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

SUBJECT: ST. LUCIE UNIT 2 — SUMMARY OF CONFERENCE CALLS WITH FLORIDA POWER AND LIGHT COMPANY REGARDING THE 2001 STEAM GENERATOR INSPECTION (TAC NO. MB3451)

Dear Mr. Stall:

On September 12, 2001, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with Florida Power and Light Company (FPL) representatives regarding the planned steam generator inspection activities at St. Lucie, Unit 2. Additional calls were held during the ongoing inspections on December 6, December 7, December 10, December 11, and December 13, 2001. Enclosed is a brief summary of the conference calls prepared by the NRC staff. The materials provided by FPL in support of the calls are attached to this summary.

If you have any questions regarding this material, please contact me at (301) 415-3974.

Sincerely,

/RA/

Brendan T. Moroney, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-389

Enclosures: As stated

cc w/enclosures: See next page

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SUMMARY OF CONFERENCE CALLS

WITH

FLORIDA POWER AND LIGHT COMPANY

REGARDING CURRENT STEAM GENERATOR INSPECTION RESULTS

AT ST. LUCIE UNIT 2

SEPTEMBER 12, 2001 PRE-OUTAGE CONFERENCE CALL

On September 12, 2001, Florida Power and Light Company (FPL) described their plans for the forthcoming St. Lucie Unit 2 steam generator (SG) inspection. The licensee planned to perform full-length bobbin-coil examination of 100 percent of the inservice tubes. In addition, the licensee planned to use a rotating pancake coil (RPC) equipped with a Plus Point coil to inspect: the U-bend region of 30 percent of the tubes in rows 1 and 2; 30 percent of the dents (randomly located, manufacturing related) on the hot-leg side of the SG; the hot-leg expansion-transition region of 100 percent of the tubes; and all new or changed free span indications. The licensee also indicated they would perform in situ pressure testing based on Electric Power Research Institute (EPRI) guidelines, and their inspection plan meets or exceeds industry guidance, and incorporates site-specific and industry-wide experience. The staff did not raise any issues with respect to the licensee's initial inspection plans.

DECEMBER 6, 2001 OUTAGE CONFERENCE CALL

During the December 6, 2001, conference call, FPL discussed the results of the SG inspections completed to date. The conversation focused on mechanical wear indications, low row U-bend inspections, FPL's assessment of the impact of the fall 2001 Three Mile Island Unit 1 (TMI-1) issue discussed in U.S. Nuclear Regulatory Commission (NRC) Information Notice 2002-02 (ML013480327) on St. Lucie Unit 2's inspection plans, and the identification of axial indications.

The licensee identified mechanical wear indications at the upper eggcrates and U-bend support structures with the bobbin probe. The licensee stated that all new wear indications are also inspected with an RPC probe to confirm the degradation mechanism. In addition, previously detected wear indications are inspected with an RPC probe if there is evidence of an increase in flaw depth or a signal change which could indicate the presence of a different degradation mechanism (e.g., cracking).

The licensee had completed 80 percent of their inspections of the U-bend region of the row 1 and 2 tubes at the time of the call. No flaw signals or geometry signals had been identified. The licensee's pre-outage assessment of the St. Lucie Unit 2 eddy current data indicated that the mid-frequency plus point probe noise levels were lower than those encountered with the EPRI qualification data set. Therefore, FPL planned to use the mid-frequency plus point probe for the December 2001 outage.

FPL briefly discussed the impact of the fall 2001 TMI-1 issue on the St. Lucie Unit 2 inspection. The licensee concluded that deplugging and subsequent inspection was not necessary. This was based on the difference in cross-flow velocities between the two plants. In addition, all

plugs at St. Lucie Unit 2 are either welded plugs or original alloy 690 mechanical plugs. NRC staff indicated that based on the information available at that time, they had no further questions.

The licensee stated that based on inspection findings to-date, the number and size of indications were generally within the bounds of those observed in previous inspections with two exceptions: the number of axial indications at eggcrates appears to have significantly increased, and three axial indications were found at dents located just above the hot-leg tubesheet.

At the time of this call, the number of axial indications at eggcrates had increased from 15 in the previous outage to 74 during the current outage, and the eggcrate inspections were not complete. The licensee indicated that these indications were being detected by the bobbin probe and did not appear to challenge tube integrity performance criteria. A sample of these indications would be in situ pressure tested.

The licensee identified three axial indications in dents located just above the tubesheet on the hot leg side. The axial indications were only identified with the RPC probe (i.e., they were not identified based on analysis of the bobbin probe data), and appeared to have fairly significant depths. The indications were located in large dents, ranging in voltage from 22 to 44 volts as measured with the bobbin coil. The licensee's previous RPC inspection of these dents in April 2000 did not result in the identification of any degradation. Based on these results, the licensee expanded their initial scope of RPC examinations at dented locations to include all dents greater than 3 volts that are located between the top-of-tubesheet on the hot-leg side and the first eggcrate support. The licensee's initial plans for inspecting dents consisted of inspecting 30 percent of the dents with an RPC probe on the hot-leg side of the SG. The licensee also inspected dents as a result of performing other inspections (e.g., inspection of the hot-leg expansion transitions). In addition, they planned to inspect a small sample of dents on the cold-leg side of the SG. A conference call was scheduled for the next day to discuss the licensee's basis for not expanding the scope of their RPC inspections of dents above the first eggcrate on the hot-leg side of the SG.

DECEMBER 7, 2001 OUTAGE CONFERENCE CALL

Since the previous conference call, the licensee identified one additional axial indication at a dent located 24 inches above the top-of-tubesheet on the hot-leg side of the SG. The dent was 24 volts and the indication did not appear to be as large as the first three.

Subsequent to the previous conference call, FPL had also decided to inspect all dents greater than 5 volts located between the first hot-leg eggcrate support and the hot-leg bend with an RPC probe; therefore, all dents greater than 5 volts in the hot leg were being inspected with an RPC probe. In addition, FPL indicated they were in the process of reviewing the bobbin data for all dents on the hot-leg side of the SG in the 3- to 5-volt range. This review was being conducted since there is a bobbin analysis technique qualified for detection of axial outer-diameter stress-corrosion cracking indications in less than 5-volt dents, and dents between 3 to 5 volts may show some distortion in the bobbin data if an axial flaw is present.

In situ pressure test plans were also discussed. In situ pressure testing was expected to begin on December 8, 2001.

The staff requested another conference call on December 10, 2001, to discuss the final eddy current results, results of in situ pressure testing, and the licensee's basis for their final dent inspection scope.

DECEMBER 10, 2001 OUTAGE CONFERENCE CALL

During this call, the axial indications identified at eggcrate supports and in dents were discussed.

A total of 257 axial indications at eggcrate supports were identified which was a significant increase over the 15 found during the April 2000 inspection. Several of these indications in SG "A" were in situ pressure tested and passed. Several in SG "B" still remained to be in situ pressure tested.

Two additional axial indications in dents were identified since the last call. One was located in a 3.5-volt dent, 3.8 inches above the fifth eggcrate support. The second was located in a 6.1-volt dent in the U-bend region of a row-13 tube. Based on these results, the licensee further increased the scope of their RPC inspections of dents to include all dents greater than 5 volts in the U-bend region of the tubes in rows 1 through 18. Further, the licensee stated they had inspected a majority of dents at the cold leg top-of-tubesheet. The staff questioned how the scope of inspection of dents on the cold leg compared to the total population of dents on the cold leg. The licensee did not have the information immediately available, and agreed to discuss this question in more detail during the next conference call. However, it appeared that the scope of inspections was limited to dents at the cold leg top-of-tubesheet.

During this call, the staff questioned the licensee's basis for (a) not performing RPC inspections or reanalyzing bobbin data at dents less than 3 volts in light of the identification of an axial indication in a 3.5-volt dent, (b) limiting the inspection of dents in the U-bend region to the tubes in rows 1 through 18, and (c) the scope of the inspections of dents on the cold-leg side of the SG given the identification of an axial flaw in the U-bend.

During the call, the licensee stated they planned to preventively plug all dents greater than 10 volts which were located below the first eggcrate support on the hot leg side of the SG. The licensee was taking this action due to the potential that the dent could be masking the presence of an axial flaw. The staff questioned the basis for this threshold (i.e., the dent voltage threshold and limiting the criteria to below the first hot-leg eggcrate support).

The staff scheduled a followup conference call for December 11, 2001, to discuss additional in situ test results, the basis for the licensee's scope of inspection of dents, and the basis for the licensee's preventive plugging plans.

DECEMBER 11, 2001 OUTAGE CONFERENCE CALL

At the time of this call, all in situ pressure tests were complete in SG "A" with no leakage and no burst. SG "B" tests were still ongoing. The licensee indicated that the SG "A" results seemed to indicate that the flaw depth estimates were significantly overcalled, because the tubes were maintaining a much higher pressure differential than predicted based on eddy current estimates. Several of the indications were predicted to burst at a pressure significantly below the performance criteria target of three times normal operating pressure differentials ($3\Delta P$). For

example, one tube was predicted to burst at 2490 psi when the 3ΔP target was 4865 psi. The licensee also discussed the preventive plugging of a handful of tubes based on a slightly distorted dent which may be an indication of the presence of an axial flaw. Lastly, the licensee described the scope of inspection in the U-bends and in the cold leg.

At the end of this call, the staff indicated that there were potential challenges for the licensee in performing their operational assessment (i.e., an assessment demonstrating tube integrity would be maintained between tube inspections) because of the scope of the licensee's dent inspection program. The staff requested a meeting between NRC and FPL once the licensee's operational assessment was complete. The staff requested the licensee be prepared to describe how they accounted for uninspected dents (and, therefore, the possibility of axial flaws remaining in-service) in the operational assessment.

The licensee agreed to a future meeting and also agreed to provide final in situ test results to the NRC staff as soon as they were available.

DECEMBER 13, 2001 OUTAGE CONFERENCE CALL

The licensee requested this conference call to discuss further developments in the inspection of dents. The licensee indicated that all in situ tests were complete with no leakage or burst. Since the previous conference call, the licensee decided to expand their RPC inspection scope of dents to include:

- All dents greater than 3 volts from the hot leg top-of-tubesheet to the first eggcrate
- All dents greater than 5 volts from the first eggcrate to the hot leg bend
- All dents greater than 5 volts in all U-bends (from the hot leg bend to the cold leg bend)
- All dents greater than 10 volts in the cold leg (to the cold leg bend)

Bobbin screening was performed on all dents with voltages ranging from 3 to 5 volts.

The licensee also clarified that their calibration of dent voltages differed from the industry standard and that a 3-volt dent at St. Lucie was the same as a 2.4-volt dent in the industry. Therefore, their dent threshold was slightly lower than previously understood by the NRC.

FPL stated they believed this scope of inspections along with their in situ pressure tests sufficiently bound all dents and would enable them to account for any dents not inspected in their operational assessment.

At the time of this call, eddy current inspections were still ongoing due to the expanded scope. The staff agreed that there was no need for a followup call unless another axial flaw in a dent was identified. The licensee agreed to a future meeting to discuss their operational assessment, specifically, how they accounted for uninspected dents (i.e., dents less than 3 volts and uninspected dents on the cold leg), and the basis for the scope of preventive plugging of dented tubes.

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