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ACCESSION NBR:9701090182 DOC.DATE: 96/12/17 NOTARIZED: NO DOCKET #
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SUBJECT: Forwards requested info on four circumferential indications located at drilled support plates.

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Florida Power & Light Company, P.O. Box 128, Fort Pierce, FL 34954-0128

FPL

December 17, 1996

L-96-324
10 CFR 50.4

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

RE: St. Lucie Unit 1
Docket No. 50-335
Outage SL1-14 Steam Generator Tube Inspection
NRC Information Request Response

The information requested on the four circumferential indications located at the drilled support plates of the Unit 1 steam generators is attached. The information was requested during a conference call between Florida Power and Light Company and the NRC Staff on November 14, 1996. The indications were identified during the St. Lucie Unit 1 Spring 1996 (SL1-14) steam generator tube inspection.

There are no new regulatory commitments in this letter. Please contact us should you require any additional information.

Very truly yours,

J. A. Stall
Vice President
St. Lucie Plant

JAS/GRM

A001 1/1

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

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St. Lucie Unit 1
Docket No. 50-335
L-96-324 Attachment

NRC Request:

Provide documentation on circumferential indications reported at drilled support plates during the Spring 1996 steam generator inspection at St. Lucie Unit 1. Include available information on root cause.

EPL Response:

The upper two supports in the St. Lucie Unit 1 steam generators are partial plates which are 1.0" thick and have drilled tube holes. The 9th drilled support extends from tube row 91 through 140. The 10th drilled support extends from tube row 117 through 140. The inner edge of the drilled plates (row 91 & 117) is typically referred to as the cord or scallop bar, and surrounds only half of the tube circumference for tubes in these rows. A "Rim Cut" was performed for the drilled plates during early operation to relieve denting stresses. The procedure involved staking and expanding selected tubes to capture the plates, cutting the support lug attachments and trimming the edge of the plates to allow movement.

Denting levels at St. Lucie 1 are considered minor, and do not interfere with passage of inspection probes. Approximately 20% of the drilled plate intersections contain dents 5 volts or greater based on bobbin coil inspection. Bobbin coil voltage is established by setting volts equal to 5 using four flat bottom drill holes on an ASME calibration standard.

During the Spring 1996 inspection, MRPC testing was expanded to all active hot and cold leg drilled support intersections after a circumferential indication was reported which was not associated with denting. A total of 4 circumferential indications was reported after inspecting approximately 11,000 intersections. MRPC and bobbin coil inspection results for these indications are summarized in the attached table.

Available information for the indications is summarized as follows:

a. Three (3) of the four (4) indications are located at the 9th drilled support and are along the cord edge in tube row 91 or 92. Two of these are in the hot leg of the A steam generator and one is in the B steam generator cold leg. The remaining indication is located in the B steam generator hot leg at the 10th support 9 rows from the cord edge in tube row 126.

b. Two of the indications are associated with minor denting. No evidence of denting is present for the remaining two indications.

c. Directional inspection techniques used for the indications located in the 9th support show that two (2) face toward the divider plate and one (1) faces away from it.

d. The eddy current estimated size of these indications is smaller than other circumferential indications located at the top of the tubesheet which were in-situ pressure tested with favorable results.

Potential root causes include accumulated stresses due to denting, lockup, movement, and bending of tubes. Significant tube strain could be present from lockup and bending without significant plastic deformation. Recent inspection results from similar design plants have shown small numbers of circumferential indications at drilled supports associated with denting.

St. Lucie Unit 1
Docket No. 50-335
L-96-324 Attachment

St. Lucie Unit 1 Steam Generator Circumferential Flaws at Drilled Support Plates									
Indication Location					1996 MRPC Results			1996 Bobbin Results	
S/G	ROW	LINE	ELEVATION	Arc Deg.	Max. Depth	Avg. Depth	Volts	Depth (1)	Volts
A	91	143	9H + 0.3"	61deg.	46%	7.8%	2.2	DNT	7.2
A	92	76	9H - 0.1"	65 deg.	63%	11.4%	1.2	NDD	n/a
B	92	38	9C + 0.0"	102 deg.	63%	17.8%	2.2	5%	1.0
B	126	68	10H + 0.2"	185 deg.	32%	16.4%	1.0	DNT	4.4

(1) 1996 Bobbin % based on re-analysis of data by lead analyst personnel.
Note: Elevation shown is +/- from center of support thickness
Avg. Depth = Max. Depth x Arc. Deg. / 360