Florida Power & Light Company, 6501 S. Ocean Drive, Jensen Beach, FL 34957

FPL

June 28, 2006

L-2006-153
10 CFR 50.73

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

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: 2006-003-00
Date of Event: May 6, 2006
Missed Eddy Current Indication from SL2-15 Inspection

The attached Licensee Event Report 2006-003-00 is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

Gordon L. Johnston
Site Vice President
St. Lucie Plant

GLJ/dlc

Attachment

IE22

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
St. Lucie Unit 2	05000389	1 OF 4

4. TITLE

Missed Eddy Current Indication from SL2-15 Inspection

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
05	06	2006	2006	- 003 -	00	6	28	2006	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

6

10. POWER LEVEL

0

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Donald L. Cecchett - Licensing Engineer	772-467-7155

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
-	-	-

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On May 6, 2006, St. Lucie Unit 2 was in Mode 6, shutdown for the SL2-16 refueling outage. During steam generator eddy current testing (ECT), FPL determined that an error was made during the previous refueling SG ECT that allowed a defect in a steam generator tube (R100 L96 in SG 2B) to remain in service during Cycle 15 operation.

This event was caused by an incomplete rotating probe inspection of bobbin probe identified indications during SL2-15. Corrective actions included plugging of the subject tube, and review of rotating probe data to ensure the entire target location was tested where the data was used to disposition a bobbin indication as "no degradation found" (NDF) during the SL2-15 outage inspection. This review determined that one other incomplete rotating probe test resulted in a second tube (R87 L97 in SG 2B) remaining in service during Cycle 15 that was not fully evaluated by Plus Point. Tube integrity assessment for both tubes and in-situ pressure testing for R100 L96 during the SL2-16 outage, demonstrated that the defective tubes met the structural integrity and accident induced leakage performance criteria of NEI 97-06, "Steam Generator Program Guidelines." Therefore, there was no impact to the health and safety of the public.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

Description of the Event

ECT consists of bobbin probe inspections for general purpose screening, and rotating probe inspections for regions where the bobbin probe is not qualified for detection of degradation (i.e., tubesheet region). Therefore, the rotating probe is used to characterize bobbin indications to ensure compliance with TS SR 4.4.5.4.a.6 "Plugging or Repair Limit."

On May 6, 2006, St. Lucie Unit 2 was in Mode 6 shutdown for the SL2-16 refueling outage. During steam generator (SG) (EIIS: AB) ECT testing, FPL determined that an error was made during the previous refueling SG ECT. During the previous February 2005 SG inspection, a bobbin indication was reported at the first hot leg tube support in Row 100 Line 96 in SG 2B. Subsequently, FPL performed a diagnostic inspection with a rotating Plus Point probe. No defect was detected and the tube remained in service. During the May 2006 steam generator inspection, FPL again performed a Plus Point diagnostic test after the same indication was reported during bobbin coil testing, and this time the rotating probe confirmed the presence of a defect in this tube. A routine review of prior inspection data was completed and it was determined on May 6, 2006, that the rotating probe inspection from SL2-15 did not include the entire target location to be tested, i.e., eggcrate tube support, thereby missing the portion that contained the indication. R100 L96 exceeded initial screening limits and was in-situ pressure tested to demonstrate that the structural integrity and accident induced leakage performance criteria of NEI 97-06 (Steam Generator Program Guidelines) were maintained. This tube passed in-situ pressure testing without any leakage or burst. This effectively demonstrated that the 2B SG was capable of performing its intended safety function during Cycle 15 operation. However, the maximum depth measured during SL2-16 suggests that the indication likely exceeded the 40% plugging limit of TS 4.4.5.4.a.6 at the time of the SL2-15 inspection.

All SL2-15 rotating probe data was reviewed to ensure that the entire target location was tested where the data was used to disposition a bobbin indication as "no degradation found" (NDF). This review determined that the SL2-15 rotating probe test for a bobbin indication in R87 L97 at the second support in SG 2B was also incomplete. The bobbin indication was observed again at SL2-16 and a rotating probe test confirmed the indication as a crack and the tube was plugged. Based on tube integrity assessment during the SL2-16 outage, there was no structural or leakage integrity issue associated with this tube remaining in service during Cycle 15. The results of the data reviews show this to be an event limited to a single calibration group of data in 2005. No additional incomplete tests were observed.

In summary, two rotating probe inspections during the SL2-15 ECT did not cover the entire target area of the tube support region, thereby missing indications identified by the bobbin probe as potential defects. This event is considered an incomplete surveillance caused by the two incomplete rotating probe inspections of bobbin probe indications identified during SL2-15.

Cause of the Event

The cause for the incomplete inspections is that the data acquisition equipment operator did not recognize that the tube end was incorrectly located and failed to correct the situation. The error occurred only during special interest rotating probe inspection of bobbin indications, and resulted in faulty input to the axial encoder, which determines axial position within the tube. The error appears to be a human performance error. The operator has several years of experience and a good performance record. There were no known extenuating circumstances. The data was properly collected by the same operator before and after the error occurred. In addition, the inspection vendor does have a human performance program that is reviewed with each operator prior to each inspection.

Analysis of the Event

This event is reportable under 10 CFR 50.73(a)(2)(i)(B) as any operation or condition prohibited by the Technical Specifications (TS). TS 3.4.5 states that each steam generator shall be operable or restored to operable status prior to increasing T_{avg} above 200 degrees F. TS Surveillance 4.4.5.0 states that each steam generator shall be demonstrated operable by performance of the required augmented in service inspection program. Contrary to TS, St. Lucie Unit 2 exceeded 200 degrees F without establishing the operability of the steam generators by surveillance requirements. Although the in-situ pressure test performed during the Spring 2006 outage concluded that the degraded SG tube was capable of performing its safety function, the maximum depth measured during SL2-16 suggests that the indication likely exceeded the 40% plugging limit of TS 4.4.5.4.a.6 at the SL2-15 inspection.

Analysis of Safety Significance

The tube at R100 L96 in SG 2B was in-situ pressure tested to demonstrate that the structural integrity and accident induced leakage performance criteria of NEI 97-06 (Steam Generator Program Guidelines) was maintained. The tube passed in-situ pressure testing without any leakage or burst. Based on tube integrity assessment during SL2-16, R87 L97 did not exceed initial tube integrity screening criteria for in-situ pressure testing, therefore, there was no structural or leakage integrity issue associated with this tube remaining in service during Cycle 15. This effectively demonstrated that the 2B SG was capable of performing its intended safety function during Cycle 15 operation. However, the maximum depths measured during SL2-16 suggest that the indications in these tubes likely exceeded the 40% plugging limit of TS 4.4.5.4.a.6 at the SL2-15 inspection.

Based on the satisfactory in-situ pressure testing, performance of 100% ECT during the SL2-16 outage, and subsequent process verification, FPL concludes this event had no impact on the health and safety of the public.

Corrective Actions

The proposed corrective actions and supporting actions listed below are entered into the site corrective action program. Any changes to the proposed actions will be managed under the commitment management change program.

1. R100 L96 in SG 2B was in-situ pressure tested to verify that structural and leakage integrity was maintained during Cycle 15. Tube integrity assessment for R87 L97 in SG 2B at SL2-16 verified that structural and leakage integrity was maintained during Cycle 15. Both tubes were plugged at SL2-16 (Complete).
2. All rotating probe data was reviewed to ensure that the entire target location was tested where the data was used to disposition a bobbin indication as "no degradation found (NDF)" during SL2-16. No additional incomplete tests were observed (Complete).
3. Revise the FPL steam generator program procedure to capture the lessons learned from St. Lucie 2, regardless of the vendor used for future inspections, to include attributes for verification of vendor training on location of tube ends using auto-locating software, verification that FPL data analysis guidelines provide effective methods to ensure that the extent of examination is obtained for rotating probe inspection of bobbin indications, including a requirement that lead personnel review results where a bobbin indication was resolved as a NDF, and verification that vendor has a human performance program and training as part of their inspection preparations. (08/15/06).

Similar Events

LER 50-389/1998-008-00, "Missed Technical Specification Steam Generator U Tube Inspection."
LER 50-389/2001-03-00, "Steam Generator Tube That Exceeded Plugging Criteria Remained In-Service."

Failed Components
None