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

FPL

February 14, 2005

L-2005-028
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: 2004-003-00
Date of Event: December 16, 2004
Panel Display Failures Caused Loss of
Technical Specification Required Range

The attached Licensee Event Report 2004-003 is being submitted pursuant to the requirements of 10 CFR § 50.73 to provide notification of the subject event.

Very truly yours,

William Jefferson, Jr.
Vice President
St. Lucie Nuclear Plant

WJ/KWF

Attachment

IE22

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

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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4. TITLE

Panel Display Failures Caused Loss of Technical Specification Required Range

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	16	2004	2004	- 003 -	00	02	14	2005	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE: 1

10. POWER LEVEL: 100

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Kenneth W. Frehafer, Licensing Engineer	(772) 467 - 7748

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
E	CB	FI	V153	YES	E	BP	TI	V153	YES

14. SUPPLEMENTAL REPORT EXPECTED			15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

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

On December 16, 2004, St. Lucie Unit 2 was in Mode 1 at 100 percent reactor power. FPL completed an evaluation that determined that past operation with faulty Versatile indicators for charging flow/pressure and shutdown cooling temperature at the hot shutdown panel constituted a reportable condition. In January 2004, these displays were identified as degraded and the condition was erroneously judged to only be an equipment degradation issue and not a loss of Technical Specification required range. The displays remained in service beyond Technical Specification allowed outage times.

Corrective actions include replacement of the subject displays, verification that the remaining Versatile work scope did not pose any current or past operability issues, and modification of the model work order to provide additional guidance on Technical Specification range requirements.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Description of the Event

On December 16, 2004, St. Lucie Unit 2 was in Mode 1 at 100 percent reactor power. FPL completed an evaluation that determined that past operation with faulty Versatile indicators constituted a reportable condition. Versatile Instruments Measuring 2000 Bar graph Indicators consist of a front display board that includes the actual indicator bar graph and associated front board calibration components. The Versatile is configured to accept a representative input signal on the front display board for the required range.

Versatile displays are equipped with a digital backup display. Therefore, the loss of bar graph sections would not result in a complete loss of the instrument since the parameter value could be verified by the associated digital readout. However, in selected St. Lucie Units 1 and 2 applications the display is mounted horizontally. In these applications the digital backup display is hidden to prevent its use because there is no way to rotate the digital display to correct its orientation. In these cases, continued degradation of or losses to the upper and/or lower sections of the bar graph could cause a reduction in the instrument's range.

In 1995, FPL discovered that Versatile displays can experience degradation due to gas contamination in the vacuum-florescent display. A preventive maintenance (PM) activity was established to identify Versatile display loss and degradation. In January and February of 2004 ongoing semi-annual Versatile PM activities identified that a large quantity of instruments (over 100) had inoperative upper or lower display sections. Furthermore, immediate repairs could not be completed due to the unavailability of parts.

Among the population of degraded instruments were two horizontally mounted displays associated with St. Lucie Unit 2 hot shutdown panel instrumentation. From a Technical Specification (TS) perspective, hot shutdown panel instrumentation is unique in that the required ranges are stated as part of the TS Limiting Condition for Operation (LCO). The two instruments were:

- FI-2212, charging flow/pressure at the hot shutdown panel [EIIS:CB:FI], with no indication at the upper 10 percent. The display was replaced under work order 34002013 on December 3, 2004.
- TI-3351Y, shutdown cooling temperature at the hot shutdown panel [EIIS:BP:TI], with no indication at the upper 10 percent. The display was replaced under work order 34002755 on December 3, 2004.

These instruments lacked a digital backup for the lost sections of the bar graph displays. At the time of the PMs, the effect of the lost bar graph display on TS operability requirements was not recognized nor documented. On December 16, 2004, all open Versatile indicator work orders were reviewed and no operability or reportability issues were found with the other discrepant indicators. In view of the above repairs and reviews, no present operability condition exists.

Cause of the Event

The apparent cause of this event is the acceptance of longstanding equipment issues coupled with less than adequate detail in the PM process and a desensitization of Operators to these type issues leading to the failure to recognize that these PM failures constituted a loss of Technical Specification instrumentation.

When the instrument displays were replaced it became apparent that these bar graph displays had failed sections, not dimmed sections, and that backup digital displays were not available to compensate for the lost display ranges. Furthermore, the monthly channel check TS surveillances that the operators performed would not have identified the failed display sections because the process variables were not in the upper 10 percent of the display.

As discussed earlier, FPL created a PM to identify premature Versatile display degradation as a compensatory measure until the condition could be resolved. Over the years, detection and repair of the Versatile displays became the accepted resolution to the reliability issue. However, now Versatile displays are being phased out by plant modifications that will replace a majority of the Versatile instruments with a new OTEK design. These displays utilize a long life LED display instead of the contamination prone vacuum-fluorescent display.

Analysis of the Event

This event is reportable under 10 CFR 50.73(a)(2)(i)(B) as "A ny operation or condition which was prohibited by the plant's Technical Specifications... "

FI-2212 and TI-3351Y are located on the St. Lucie Unit 2 hot shutdown panel and are required to be operable to satisfy TS 3.3.3.5. TS Table 3.3-9 specifies the instrument ranges and the number of channels required to satisfy TS 3.3.3.5.

The actual instrument range of both FI-2212 and TI-3351Y is equal to that specified in Table 3.3-9. With the top 10 percent of the display segments of FI-2212 and TI-3351Y not illuminating and no backup digital display available, these instruments did not satisfy the LCO range requirements specified in Table 3.3-9 and as such, were inoperable.

The identified deficiencies were documented by work requests starting in January of 2004 until the replacement of these instruments in December of 2004. Thus, the condition existed for a period of time greater than that allowed by TS 3.3.3.5.a (the period of inoperability was approximately 10 months versus the 30-day allowed outage time).

Analysis of Safety Significance

A review of procedure IMP-77.01 "Versatile Indicator Repair and Calibration," indicates that there are approximately 200 Versatiles on Unit 1 and 300 on Unit 2. Of these, Unit 1 has four instruments that have no digital display and Unit 2 contains 47. Sixteen of the 47 Unit 2 indicators are associated with hot shutdown panel instrumentation that have required ranges associated with their TS LCOs.

For the two subject instruments of this LER, the displays in question are only used for operator information; no automatic safety or control functions are derived from the display. The displays were only missing the extreme upper end of the required instrument range, and the subject systems would be expected to operate within the operational portions of the display.

A 6-month PM presently exists to identify failures of the indicators however the failure rate remains high. These Versatile indicators are being replaced with the OTEK design, therefore, the existing PM and frequency is deemed adequate for detecting failures until the indicators are replaced. In addition, plant modifications have been approved to replace a majority of the Versatile instruments

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with a new OTEK design. As instruments are replaced, display failure rates should decrease and the PM eliminated.

Based on the above, this event had no significant impact to the health and safety of the public.

Corrective Actions

1. On December 3, 2004, work orders 34002755, and 34002013 replaced the Versatile displays associated with TI-3351Y, and FI-2212, respectively.
2. The model PM work orders for the Unit 1 and Unit 2 Versatile PM's have been be revised via PM change request 05-0025 to add specific direction for declaring degraded Versatiles out of service when portions of the bar graph display are out and a digital display is not present.
3. This event has been included in the Operations required reading program.

Other Information

Although the Versatile display phased replacement to the OTEK design is part of a planned on-going plant upgrade, this information was provided as background for the event. The upgrades are not a credited corrective action for this event.

Failed Components Identified

Equipment: Vacuum-Florescent Display

Manufacturer: Versatiles Measuring Instruments

Model: 2000-01-D

Similar Events

None