

# CATEGORY 1

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FACIL: 50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co.      05000389  
AUTH.NAME      AUTHOR AFFILIATION  
NOBLE, R.E.      Florida Power & Light Co.  
STALL, J.A.      Florida Power & Light Co.  
RECIP.NAME      RECIPIENT AFFILIATION

SUBJECT: LER 96-007-00: on 961211, operation prohibited by TSs occurred due to inadequate surveillance of MISS actuation logic. Testing of MSIS high containment pressure 2/4 actuation logic was satisfactorily performed on 961211.W/970109 ltr.

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FPL

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

January 9, 1997

L-97-007  
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: 96-007  
Date of Event: December 11, 1996  
Operation Prohibited by Technical Specifications  
Due to Inadequate Testing of Main Steam Isolation System Actuation Logic

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

Very truly yours,

*J. Stall for JAS*

J. A. Stall  
Vice President  
St. Lucie Plant

JAS/REN

Attachment

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

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**LICENSEE EVENT REPORT (LER)**

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 60.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20565-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

ST LUCIE UNIT 2

DOCKET NUMBER (2)

05000389

PAGE (3)

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TITLE (4)

Operation Prohibited by Technical Specifications Due to Inadequate Surveillance of MSIS Actuation Logic

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	11	96	96	007	00	1	9	97	N/A	
									N/A	

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)																					
1	100	20.2201(b)	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)(3)(i)	20.2203(a)(3)(ii)	20.2203(a)(3)(iii)	20.2203(a)(4)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(vii)	50.73(a)(2)(viii)	50.73(a)(2)(ix)	73.71	OTHER	
																							Specify in Abstract below or in NRC Form 368A

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Richard E. Noble, Licensing Engineer	(561) 467 - 7022

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On December 11, 1996, St. Lucie Unit 2 was operating in Mode 1 at 100 percent reactor power. While performing a review as requested by NRC Generic Letter 96-01, "Testing of Safety Related Logic Circuits," FPL determined that a deficiency existed in testing of the main steam isolation signal (MSIS) actuation logic on high containment pressure. Additional testing was immediately performed and completed satisfactorily.

The cause of the event was an inadequate surveillance procedure for testing the operation of the high containment pressure MSIS actuation logic. The surveillance procedure credited the observation of status lights on an automatic test insertion (ATI) device. The ATI status lights alone do not confirm that a portion of the high containment pressure MSIS actuation logic was tested. This surveillance test procedure deficiency is not applicable to Unit 1, because the MSIS actuation logic for Unit 1 does not include high containment pressure in its design.

Corrective actions include: 1) Additional testing was performed to confirm operability of the MSIS high containment pressure actuation logic. 2) The surveillance testing procedure was revised. 3) Additional safety related electrical circuitry is continuing to be reviewed with regard to testing adequacy in accordance with the actions requested in NRC Generic Letter 96-01.

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

DESCRIPTION OF THE EVENT

On December 11, 1996, with St. Lucie Unit 2 operating in Mode 1 at 100 percent power, FPL engineering personnel determined that the high containment pressure actuation logic for the main steam isolation signal (MSIS) (EIS:JE) may not have been adequately tested by current surveillance procedures. This determination was made based on an assessment of NRC Generic Letter, 96-01, "Testing of Safety Related Logic Circuits" for applicability to St. Lucie Plant.

St. Lucie Unit 2 Technical Specification (TS) Table 4.3-2, item 4c, requires that the MSIS logic be tested monthly. Instrument and control surveillance procedure 2-1400052, "Engineered Safeguards Actuation System Channel Functional Test", credits observation of the automatic test insertion (ATI) status lights for testing the MSIS actuation logic for high containment pressure. The ATI is a vendor supplied feature that inserts short duration pulses into the logic circuit and monitors the return pulses to confirm proper operation. If a monitored return pulse is not received, an ATI alarm will occur.

The MSIS logic is designed to actuate on low steam generator pressure or on high containment pressure. The MSIS actuation logic does not utilize its own high containment pressure bistables. Instead, the output signals from the high containment pressure safety injection actuation signal (SIAS) bistables are also wired to the MSIS 2/4 logic actuation modules (Refer to Figure 1). During the automatic testing of the SIAS high containment pressure bistables, ATI is not configured to look for a return pulse from the MSIS 2/4 actuation modules. Therefore, if the high containment pressure MSIS 2/4 actuation logic failed to operate in response to the injected pulse signals, no ATI alarm would be generated. The low steam generator pressure portion of the MSIS logic is verified during other portions of the ATI test sequence. Although the return pulse from high containment pressure MSIS actuation is not monitored by the ATI status lights and alarm, proper operation can be confirmed by observing the trip status lights on the MSIS 2/4 actuation modules. This surveillance test procedure deficiency is not applicable to Unit 1, because the MSIS actuation logic for Unit 1 does not include high containment pressure in its design.

On December 11, 1996, immediately following identification of the issue, proper operation of the MSIS actuation logic was confirmed by observing the MSIS 2/4 actuation module trip status lights during an ATI test sequence. Operations was notified of the issue via a St. Lucie Plant Condition Report. Because a valid surveillance test was conducted concurrent with identification, Technical Specification (TS) Surveillance Requirement 4.0.3 was not entered. TS 4.0.3 specifies that failure to perform a surveillance requirement within the allowed surveillance interval shall constitute noncompliance with the operability requirements for a Limiting Condition for Operation (LCO).

CAUSE OF THE EVENT

The cause of the event was an inadequate surveillance test procedure. Operating Procedure 2-1400052, incorrectly credits the ATI status lights for testing the high containment pressure actuation logic of the MSIS. The ATI status lights alone do not provide an adequate test of this portion of the MSIS logic.

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**ANALYSIS OF THE EVENT**

Technical Specifications

This event is reportable under 10 CFR 50.73 (a)(2)(i)(B) as "any operation or condition prohibited by the plant's Technical Specifications". St. Lucie Unit 2 TS Table 4.3-2, item 4c requires that the MSIS high containment pressure logic be tested monthly in modes 1,2, and 3. Based on the engineering review conducted for GL 96-01, the high containment pressure MSIS actuation logic was not fully tested by existing surveillance procedures. Concurrent with this discovery, proper operation of the high containment pressure initiation logic portion of the MSIS 2/4 actuation modules was verified by observation of the module status lights during an ATI test sequence. The surveillance procedure 2-1400052 has been revised to include the correct steps to verify operation of the 2/4 logic module status lights during the ATI sequence.

Assessment of Safety Significance

MSIS actuation is a functional unit of the engineered safety features actuation system (ESFAS) at St. Lucie Plant. MSIS functions to close the main steam and main feedwater isolation valves in the event of a steam line break. The primary actuation signal for MSIS is low steam generator pressure. The high containment pressure actuation of MSIS provides a diverse actuation signal that is most significant for postulated small steam line breaks where steam generator pressure may remain above the MSIS setpoint for an extended period of time.

The existing surveillance procedure demonstrates operability of all but a small portion of the high containment pressure MSIS actuation logic. Specifically the high containment pressure 2/4 logic circuits, which are part of each MSIS 2/4 actuation module, are not verified by the surveillance procedure. The high containment pressure bistables and isolation modules, which input into the MSIS 2/4 logic modules, are common with the SIAS logic which is tested by the ATI circuit every 27 seconds. The output side of the MSIS 2/4 actuation modules is also verified by ATI every 27 seconds during the low steam generator pressure portion of the MSIS logic test. The MSIS high containment pressure 2/4 logic is implemented using integrated circuits which are inherently more reliable than relay logic circuits. These integrated circuits are also tested during the 18 month integrated safeguards test, although each individual logic combination is not verified. Furthermore, observation of the MSIS 2/4 actuation module status lights demonstrated that the logic was in fact functional at time of discovery and, therefore, would have been functional in the past. Therefore, the health and safety of the public was not adversely affected by this event.

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**CORRECTIVE ACTIONS**

1. Testing of the MSIS high containment pressure 2/4 actuation logic was satisfactorily performed on December 11, 1996.
2. The St. Lucie Unit 2 Test Procedure (2-1400052) was approved on January 6, 1997 to include specific instructions for verification of the MSIS 2/4 actuation module trip status lights as part of the ATI check.
3. In accordance with Generic Letter 96-01, FPL is continuing to review applicable safety related logic circuitry and testing procedures to ensure that all circuit components required to be tested are adequately addressed by surveillance procedures.

**ADDITIONAL INFORMATION**

**Component Failures**

None

**Previous Similar Events**

LER 389 96-005      "Operations prohibited by TS due to inadequate testing of Reactor Trip Breakers" This event describes an additional surveillance inadequacy identified during review performed per Generic Letter 96-01.

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FIGURE 1

SIMPLIFIED MSIS ACTUATION LOGIC

