

# CATEGORY 1

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9612260012 DOC.DATE: 96/12/20 NOTARIZED: NO DOCKET #  
 FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389  
 AUTH.NAME AUTHOR AFFILIATION  
 BENKEN,E.J. Florida Power & Light Co.  
 STALL,J.A. Florida Power & Light Co.  
 RECIPIENT AFFILIATION

SUBJECT: LER 96-005-00:on 961206,determined that independent operability of trip coils had not been adequately tested. Caused by inadequate surveillance procedure.Performed testing of coils & revised procedures.W/961220 ltr.

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**FPL**

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

December 20, 1996

L-96-337  
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: 96-005  
Date of Event: December 6, 1996  
Operation Prohibited by Technical Specifications  
Due to Inadequate Testing of Reactor Trip Breakers

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. A. Stall  
Vice President  
St. Lucie Plant

JAS/EJB

Attachment

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

9612260012 961220  
PDR ADOCK 05000389  
S PDR

an FPL Group company

**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: 50.0 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 (IT-8 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20556-0001, 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 Testing of Reactor Trip Breakers

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	06	96	96	005	00	12	20	96	N/A	
									N/A	
OPERATING MODE (9)		1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)						
POWER LEVEL (10)		100		20.2201(b)		20.2203(a)(2)(v)		X	50.73(a)(2)(i)	50.73(a)(2)(viii)
				20.2203(a)(1)		20.2203(a)(3)(i)			50.73(a)(2)(iii)	50.73(a)(2)(x)
				20.2203(a)(2)(i)		20.2203(a)(3)(ii)			50.73(a)(2)(iii)	73.71
				20.2203(a)(2)(iii)		20.2203(a)(4)			50.73(a)(2)(iv)	OTHER
				20.2203(a)(2)(iii)		50.36(c)(1)			50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
				20.2203(a)(2)(iv)		50.36(c)(2)			50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME

Edwin J. Benken, Licensing Engineer

TELEPHONE NUMBER (include Area Code)

(561) 467 - 7156

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 6, 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 the independent operability of trip coils associated with the Reactor Protective System (RPS) Trip Circuit Breakers (TCB) had not been adequately tested by surveillance procedure. The appropriate Technical Specification Action requirements were implemented for failure to perform a surveillance requirement. Additional testing was initiated and subsequently completed satisfactorily per Technical Specification requirements.

The cause of the event was an inadequate surveillance procedure for testing the operation of the reactor trip circuit breakers.

Corrective actions include: 1) Operability testing of the trip coils was performed to include additional testing of electrical contacts in the TCB circuit paths. 2) The surveillance procedure governing the testing of the Reactor Protective System logic was changed to include testing the required circuitry contacts. 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 6, 1996, with St. Lucie Unit 2 operating in Mode 1 at 100 percent power, FPL engineering personnel determined that the independent operability of the undervoltage and shunt trip electrical logic paths for the Reactor Trip Circuit Breakers (TCBs) (EIS:JC) may not have been adequately tested by current St. Lucie Unit 2 procedures. This determination was made following a review of a similar condition found at Palo Verde Station and 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) 4.3.1.1, requires that a functional test be performed at least once per 18 months or following maintenance or adjustment of the reactor trip circuit breakers to verify the independent operability of the undervoltage and shunt trips. At 1705 on December 6, 1996, based upon the above determination, Operations invoked Technical Specification 4.0.3. for failure to perform a surveillance requirement within the allowed surveillance interval. A Condition Report (CR) was initiated to assess the validity of the testing requirements and review the operability of the TCBs.

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). TS 4.0.3 allows that action requirements may be delayed for up to 24 hours to permit the completion of a surveillance when the allowable outage time limits of the LCO action requirements are less than 24 hours.

Following discovery of the above condition, functional testing was initiated at 2145, on December 6, 1996, to verify the independent operability of the undervoltage and shunt trips for the reactor TCBs. This testing was completed satisfactorily at 2215 on December 6, 1996, and TS 4.0.3 was then exited.

CAUSE OF THE EVENT

The cause of the event was an inadequate surveillance test procedure. Operating Procedure 2-1400059, "Reactor Protection System - Periodic Logic Matrix Test," contains the instructions for performance of the operability test for the Reactor Trip Circuit Breakers shunt trip and undervoltage trip devices (coils). The surveillance test instructions of the procedure verified the satisfactory operation of both of the above shunt and undervoltage trip devices, and were consistent with vendor recommendations, however, the test did not verify the independent operation of the electrical contacts which operate the shunt and undervoltage trip coils. At the time of the event, the surveillance adequacy of the reactor trip circuit breakers had been identified for additional engineering review in accordance with the schedule referenced in the FPL response to Generic Letter 96-01, dated April 18, 1996.

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 4.3.1.1 requires that each reactor protective instrumentation channel be demonstrated operable by the performance of the channel check, channel calibration and channel functional test operations for the Modes and frequencies shown in table 4.3-1.

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ANALYSIS OF THE EVENT - Continued

TS table 4.3.1 requires that at least once per 18 months and following maintenance and adjustment of the reactor trip breakers, the channel functional test shall include verification of the independent operability of the undervoltage and shunt trips. Following a determination that the independent operability of the above undervoltage and shunt trip devices had not been adequately tested at St. Lucie Unit 2, Operations personnel implemented the surveillance requirements of TS 4.0.3. As previously discussed, TS 4.0.3 specifies that failure to perform a surveillance requirement within the allowed surveillance interval constitutes noncompliance with the operability requirements for an LCO and permits action requirements to be delayed for up to 24 hours to facilitate completion of the surveillance. FPL satisfactorily performed the additional, required testing of the electrical logic paths associated with the reactor trip circuit breakers within the allowable time constraints of TS 4.0.3.

Assessment of Safety Significance

The reactor trip circuit breakers are a functional unit of the Reactor Protective System (RPS) instrumentation at St. Lucie Plant. The operability of the RPS instrumentation and bypasses ensures that 1) the associated reactor trip will be initiated when a monitored parameter reaches its set point, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available from diverse parameters.

The RPS is designed so that any single failure within the system will not prevent proper protective action at the system level when required. There are four Reactor Trip Channels associated with the RPS. A two-out-of-four RPS logic trip signal results in the deenergization of four trip path relays, which in turn results in the deenergization of undervoltage coils and energization of shunt trip coils on eight reactor TCBs (Refer to Figure 1). Either of the two trip coils associated with a reactor TCB is capable of tripping the breaker from an RPS actuation. Both of the trip paths are actuated by the same RPS relay and use different sets of relay contacts to actuate their associated trip coils (Refer to Figure 2). One or both of these contacts changing state will result in the opening of the TCB. The following tests are performed at St. Lucie to verify the operability of the reactor TCBs:

1. The Trip Coil of each reactor TCB is tested by use of a test push-button which energizes the shunt trip coil and opens the breaker. This test is conducted at least every 18 months and following maintenance or adjustment of the TCB.
2. The Undervoltage (UV) Coil of each reactor TCB is tested by removing the power supply fuse which deenergizes the UV coil and opens the breaker. This test is also conducted every 18 months and following maintenance or adjustment of the TCB.
3. The RPS Periodic Logic Matrix Test is performed each month to verify that RPS trip path relays function correctly and the TCBs open when required.

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ANALYSIS of the Event - Continued

Assessment of Safety Significance - Continued

As described by the above tests, the ability of the reactor trip breakers to open on an RPS actuation signal is demonstrated by the RPS Logic Matrix Test, which is performed monthly. Additionally, the operability of the TCB trip coils and undervoltage coils is demonstrated at least every 18 months. Performance of the above testing, however, does not specifically verify that the contacts in the electrical logic paths change state to actuate the undervoltage or shunt trip coils. Individual contacts that perform a safety function are required to be tested in accordance with the guidance provided by Generic Letter 96-01.

Subsequent to this event, FPL Engineering performed a review of the testing requirements associated with the reactor TCBs. This review determined that while the potential for an undetected failure of one contact in the electrical flowpath to an RPS TCB exists during performance of the RPS Logic Matrix Test, this will not result in the failure of the TCB to trip. The dual path, electrical arrangement associated with each reactor TCB is not designed as a redundant feature, as there is no separation or isolation, and common equipment is used in both paths. The two paths are diverse, however, in that different mechanisms (energization vs. deenergization and the use of different trip coils) are provided for increased reliability of the trip mechanism.

A review of TCB surveillance tests performed at St. Lucie Unit 1 determined that at Unit 1, the RPS Logic Matrix Test Procedure, performed monthly, includes a verification of indicating lights (unique to Unit 1) provided in both the shunt and undervoltage trip paths. These indicating lights are not available at St. Lucie Unit 2. Additionally, St. Lucie Unit 1 Technical Specifications do not require a functional check be performed of the independent operability of the shunt and undervoltage trip paths. Therefore, this condition is not applicable to St. Lucie Unit 1.

Additional surveillance testing performed as a result of this event satisfactorily demonstrated that the electrical logic contacts responsible for actuating the undervoltage and shunt trip coils on the reactor TCBs were operational. No reactor trip paths were disabled as a result of the subject testing inadequacy, and sufficient system diversity and functional capability was maintained. Based upon the above, the protection of the health and safety of the public was not adversely affected by the event.

CORRECTIVE ACTIONS

1. Testing of the electrical logic contacts for the reactor trip circuit breakers was satisfactorily performed on December 6, 1996.
2. The St. Lucie Unit 2 Reactor Protection System - Periodic Logic Matrix Test Procedure (2-1400059) was revised to include additional verification of Trip Relay Contact operation during the 18 month surveillance performance.

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CORRECTIVE ACTIONS Continued

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

None

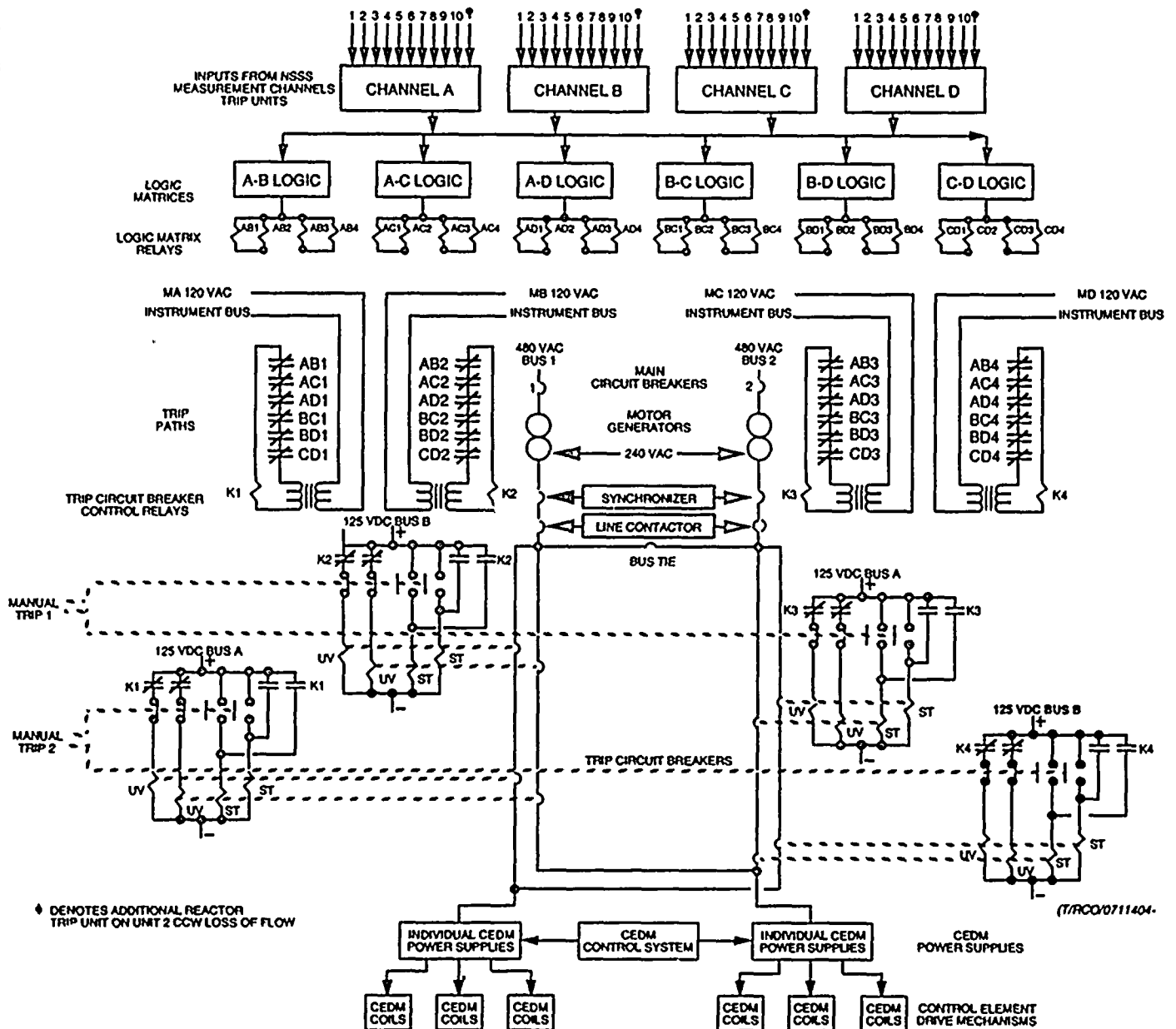
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FIGURE 1

REACTOR PROTECTIVE SYSTEM  
SIMPLIFIED LOGIC DIAGRAM





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FIGURE 2

REACTOR TRIP CIRCUIT BREAKER  
SIMPLIFIED WIRING DIAGRAM  
(TYPICAL)

