

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) St. Lucie, Unit 1		DOCKET NUMBER (2) 0 5 0 0 0 3 3 5	PAGE (3) 1 OF 0 3
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TITLE (4)
Reactor Trip During Reactor Protection System Testing Due to Faulty Switch

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 NAMES			DOCKET NUMBER(S)
0	2	06	8	6	8	6	0	0	N/A			0 5 0 0 0
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THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)

OPERATING MOD. (9) 1	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 9 9	20.405(a)(1)(i)	50.36(c)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Dave M. Williams, Shift Technical Advisor	TELEPHONE NUMBER AREA CODE: 3 0 5 4 6 5 - 3 5 5 0
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
X	J C	H S	M 3 0 2	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

Description of event

An automatic reactor trip occurred during the monthly Reactor Protection System (RPS) (EIIS:JC) Logic Matrix Test. As part of the test, two of the eight reactor trip current breakers (TCBs) were open. A faulty switch in the testing circuitry caused two more TCBS to open, leading to the reactor trip.

Cause of the Event

The RPS logic matrix relay trip select switch was found to have failed, allowing a logic matrix relay to de-energize out of sequence.

Analysis of Event

The event proceeded as a normal reactor/turbine trip from full power with no deficiencies noted.

Corrective Actions

The failed switch was replaced. The remaining similar switches in the RPS system are to be replaced as soon as parts can be obtained. It is also planned to replace these switches periodically as part of a preventative maintenance program.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Description of Event

On February 6, 1986, operations personnel were in the process of performing the monthly Reactor Protection System (RPS) (EIIS:JC) Logic Matrix Test while the unit was at 99% power. This surveillance verifies the ability of the RPS to properly actuate when the required 2-out-of-4 channel trip logic is made up. The "AB" logic matrix was being tested with an RPS channel "A" and channel "B" trip inserted by a portion of the test circuitry. The "AB" logic matrix contains four logic matrix relays, numbered AB-1 thru AB-4, each of which actuates two of the eight reactor trip current breakers (TCBs). On a valid trip signal, all four logic matrix relays would de-energize, thus opening all eight TCBs. During testing, however, a holding voltage is applied to the logic matrix relays to prevent an actual trip. A matrix relay trip select switch is then used to remove the holding voltage from individual matrix relays to verify that each relay trips its associated pair of TCBs.

At the time of the event, the AB-1 relay had been successfully tested with the result that TCB-1 and TCB-5 were open. The matrix relay trip select switch was then rotated to the next position to restore holding voltage to the AB-1 relay to allow resetting of the open TCBs. Before the TCBs could be reset, TCB-4 and TCB-8 opened, indicating that the AB-4 relay had de-energized. With four TCBs open, the power supply busses for the Control Element Assemblies (CEAs) de-energized, causing all the CEAs to drop into the core. This initiated a turbine trip, which in turn caused an automatic RPS actuation for the remaining TCBs. The trip proceeded as expected and the unit was stabilized in hot standby. The auxiliary feedwater system (EIIS:BA) automatically actuated on low steam generator level immediately following the trip, as expected.

Cause of Event

The root cause of the event was found to be a faulty matrix relay trip select switch which allowed the AB-4 relay to be momentarily de-energized out of sequence. The switch in question had been installed throughout the life of the plant and the failure mode is believed to be normal end-of-life. It should be noted that the matrix relay trip select switch is tested individually prior to the RPS channels being tripped as a normal part of the surveillance procedure. In this event, however, the failure mode of the switch was intermittent and escaped detection by this method.

Analysis of Event

The event proceeded as a normal reactor trip from full power and as such was not more severe than the loss of load transient analyzed in the Updated Final Safety Analysis Report. No deficiencies were noted during or following the trip.

The RPS system is of the de-energize to actuate type. The system is designed such that component failures will place the system in the safe (tripped) condition.

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TEXT (if more space is required, use additional NRC Form 366A's) (17)

Corrective Actions

The "AB" matrix relay trip select switch was replaced and the logic matrix test was successfully completed prior to restart of the unit. As a precaution, all the remaining original equipment logic matrix relay trip select switches will be replaced as soon as parts can be obtained. The Instrument and Controls Department will periodically replace these switches as part of a preventative maintenance program.

Additional Considerations

- A. The failed component was Micro Switch part number X62103-25AS4.
- B. A similar trip occurred previously (see LER-335-84-007) which resulted in the replacement of one of the other matrix relay trip select switches. The other switch had been replaced as it was one of the probable causes of the previous trip, although the intermittent nature of the failure prevented establishing that the switch was, in fact, the root cause.



March 10, 1986
L-86-86

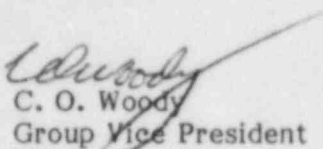
U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Reportable Event 86-2
St. Lucie Unit 1
Date of Event: February 6, 1986
Reactor Trip during Reactor
Protection System Testing Due to Faulty Switch

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

Very truly yours,


C. O. Woody
Group Vice President
Nuclear Energy

COW/SAV:dee

Attachment

cc: Dr. J. Nelson Grace
Region II, US NRC
Harold F. Reis, Esquire
File 933.1

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