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REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9206290246 DOC. DATE: 92/06/22 NOTARIZED: NO DOCKET #
 FACIL: 50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
 AUTH. NAME AUTHOR AFFILIATION
 LAUVER, C. Florida Power & Light Co.
 SAGER, D.A. Florida Power & Light Co.
 RECIPIENT NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-003-00: on 920526, EDG 2B inadvertently actuated when relay installed in cubicle 1 of 4,160-volt bus 2B3. Caused by design error. Electrical loads returned to normal & test circuit design will be changed. W/920622 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

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INTERNAL:	ACNW		2	2	ACRS		2	2
	AEOD/DOA		1	1	AEOD/DSP/TPAB		1	1
	AEOD/ROAB/DSP		2	2	NRR/DET/EMEB 7E		1	1
	NRR/DLPQ/LHFB10		1	1	NRR/DLPQ/LPEB10		1	1
	NRR/DOEA/OEAB		1	1	NRR/DREP/PRPB11		2	2
	NRR/DST/SELB 8D		1	1	NRR/DST/SICB8H3		1	1
	NRR/DST/SPLB8D1		1	1	NRR/DST/SRXB 8E		1	1
	<u>REG FILE</u> 02		1	1	RES/DSIR/EIB		1	1
	RGN2 FILE 01		1	1				
EXTERNAL:	EG&G BRYCE, J.H		3	3	L ST LOBBY WARD		1	1
	NRC PDR		1	1	NSIC MURPHY, G.A		1	1
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P.O. Box 128, Ft. Pierce, FL 34954-0128

June 22, 1992

L-92-168
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: 92-003
Date of Event: May 26, 1992
Inadvertent Actuation of the
2B Diesel Generator

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,

D. A. Sager
Vice President
St. Lucie Plant

DAS/JWH/kw

Attachment

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

DAS/PSL #716-92

290035

9206290246 920622
PDR ADDCK 05000389
S PDR



LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUIREMENT: SEE NRC'S FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-438), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT 3150-0184, OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) St. Lucie Unit 2	DOCKET NUMBER (2) 0510103891	PAGE (3) 1 OF 4
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TITLE (4) **Inadvertent Actuation of the 2B Emergency Diesel Generator due to Design Error**

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)
05	26	92	92	003	00	06	22	92	N/A		0151010111
											N/A

OPERATING MODE (9) 6	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more of the following) (11)						
POWER LEVEL (10) 10	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)	OTHER (Specify in Abstract below and in Text NRC Form 366A)	
	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)			
	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)(x)			

LICENSEE CONTACT FOR THIS LER (12)

NAME Catherine Lauver, Shift Technical Advisor	TELEPHONE NUMBER
	AREA CODE 407
	465-3550

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) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

Unit 2 was in Mode 6, Refueling. On May 26, 1992, a utility electrician tested the operability of a newly installed relay in cubicle 1 of the 2B3 4160 V bus. He satisfactorily tested the relay per his instructions. When he finished his test and released the test selector switch, the 2B3 4160 V bus tripped and all running loads deenergized. The 2B Emergency Diesel Generator started on receipt of the bus undervoltage signal and began its loading sequence.

The cause of the event is design error. The circuit contains a relay race in which the undervoltage relay may not reset before bus stripping occurs.

Corrective actions: electrical loads were restored to normal; the design of the test circuit will be evaluated and changed to prevent the unintended loss of the 4160 V bus during testing.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION PROJECT: 38.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-408), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20546, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0184), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) St. Lucie Unit 2	DOCKET NUMBER (2) 05000389	LER NUMBER (6)			PAGE (3)	
		YEAR 92	SEQUENTIAL NUMBER 003	REVISION NUMBER 00		
92 - 003 - 00 02 OF 04						

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

DESCRIPTION OF THE EVENT

Unit 2 was in Mode 6, Refueling. On May 10, 1992, an Agastat relay was installed in cubicle 1 of the 2B3 4160 V bus (E1S:EB). The relay was one of seventy-eight affected by a Plant Change/Modification to replace all commercial grade Agastat series 7000 with nuclear grade series E7000 relays.

At 1530 EDT on May 26, a utility electrician was testing one of the newly installed relays. The existing Test Relay selector switch on the switchgear door was used to test the new relays. When he moved the selector switch to the Test Relay position, one set of contacts, which energize load-shedding relays, opened to prevent a bus trip while in the Test Relay mode. Also, another relay deenergized the undervoltage relay. When the selector switch was returned to the Off position, the undervoltage relay did not reenergize before the load shedding relay contacts reclosed. This caused the load shedding relays on the 2B3 4160 V bus to energize and the 2B Emergency Diesel Generator (E1S:EK) (EDG) to start and begin its loading sequence.

CAUSE OF THE EVENT

The cause of the event is design error, in that the selector switch circuitry did not work as expected. A review of the Controlled Wiring Diagrams indicated that the circuit worked as designed, but the intended design should not cause deenergization of the bus whenever a relay is tested. The Unit 1 Relay Test switch circuit contains a time delay to prevent bus stripping. The Relay Test switch has been in place since the startup of Unit 2. This is the first time it was used.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 26.3 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-328), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20548, 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	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		92	003	00	03	OF 04

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

ANALYSIS OF THE EVENT

The start of the 2B EDG is reportable to the NRC under 10 CFR 50.73.a.2.iv. Any event or condition that results in a manual or automatic actuation of any Engineered Safety Feature is required to be reported by telephone notification within four hours and a Licensee Event Report.

The test circuit operates as follows. When the selector switch is placed in the Relay Test position, relay 94/963 is energized by CS-1/test contacts 7-7T. The relay 94/963 contacts, in series with the undervoltage relay 27/950, simulates a loss of 2B3 4160 V bus voltage. Deenergizing relay 27/950 illuminates a white light on cubicle 1, indicating that the relay circuitry operated properly. Test switch contacts 6-6T, which open in the Relay Test position, prevent the bus from stripping via the 27X-1 through 27X-12 relays.

When selector switch CS-1 is released and spring-returns from Relay Test to Off, contacts 6-6T close, enabling bus stripping, before relay 94/963 can deenergize and pick up undervoltage relay 27/950, which would prevent bus stripping. The Unit 2 2A3 4160 V bus CS-11 test switch performs the same as CS-1. Unit 1 1A3 and 1B3 4160 V buses use a 0.5 second time delay to prevent a relay race. The remaining Unit 1 and 2 relay test circuits on the 4160 V breakers affect only a single load or component except for nonsafety bus feed and AB bus feed.

When the bus stripping occurred and the 2B EDG started, plant staff initially expected the 2B Component Cooling Water (CCW) (EHS:CC) pump to restart and reported that there was a failure of a safety feature to function as expected. Electrical Maintenance investigated and concluded that, due to the manner in which bus stripping occurred, the 2B CCW pump should not be expected to restart.

The immediate effect on the plant was minor. Most of the 2B3 4160 V bus loads were out of service as part of the refueling outage. The 2B EDG was secured eleven minutes after starting and the 2B CCW and Low Pressure Safety Injection pumps were manually restarted. The 2A3 4160 V bus and 2A train of Shutdown Cooling were in service and unaffected by this event. The 2AB bus was tied to the A side. There were no safety implications to the public because the reactor was in a safe, controlled, shutdown condition at all times during this event.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION
REQUEST: 0.11 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS
AND REPORTS MANAGEMENT BRANCH (P-303), U.S. NUCLEAR REGULATORY COMMISSION,
WASHINGTON, DC 20548, AND TO THE PAPERWORK REDUCTION PROJECT (2150-0164), OFFICE
OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) St. Lucie Unit 2	DOCKET NUMBER (2) 05000389	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		92	003	00	04	OF 04

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

CORRECTIVE ACTIONS

1. Operations restored electrical loads.
2. Electrical Maintenance analyzed the involved circuits and concluded that the plant responded as designed.
3. Electrical Maintenance requested that Engineering modify the circuit design. The expected outcome is that either the test circuit will be removed entirely or that a time delay will be added to permit 27/950 to pick up before 6-6T sheds bus loads. This modification will be made during the next Unit 2 refueling outage.
4. As an interim measure, caution tags have been placed on the 2A3 and 2B3 4160 V bus test switches.

ADDITIONAL INFORMATION

Failed Components: None

Previous Similar Events Involving Unintended Deenergization of the 4160 V bus:

LER 335-88-005 "Inadvertent Start of 1A Diesel Generator During Troubleshooting due to Personnel Error"

LER 389-83-015 "4160 V Buses Deenergized"