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 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
 AUTH. NAME AUTHOR AFFILIATION
 SNYDER, M.J. Florida Power & Light Co.
 SAGER, D.A. Florida Power & Light Co.
 RECIPIENT NAME RECIPIENT AFFILIATION

SUBJECT: LER 90-008-00: on 900614, reactor shutdown due to
 unrecoverable dropped control element assembly. w/9 ltr.

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

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L-90-252

10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Gentlemen:

Re: St. Lucie Unit 1
Docket 50-335
Reportable Event: 90-08
Date of Event: June 14, 1990
Reactor Shutdown due to unrecoverable dropped
Control Element Assembly caused by an improperly
installed fuse.

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,

A handwritten signature in dark ink, appearing to read "D. A. Sager", written in a cursive style.

D. A. Sager
Vice President
St. Lucie Plant

DAS:JWH:kw

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

DAS/PSL #205

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) ST. LUCIE, UNIT 1	DOCKET NUMBER (2)	PAGE (3)
	0 5 0 0 0 3 3 5	1 OF 0 3

TITLE (4) **REACTOR SHUTDOWN DUE TO UNRECOVERABLE DROPPED CONTROL ELEMENT ASSEMBLY CAUSED BY AN IMPROPERLY INSTALLED FUSE.**

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	6	14	9	0	0	0	7	09	N/A		0 5 0 0 0 1

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more of the following) (11)									
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	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)	50.73(a)(2)(v)	73.71(c)						
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)							
		20.405(a)(1)(iii)	X	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)						
		20.405(a)(1)(iv)		50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)						
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)							

LICENSEE CONTACT FOR THIS LER (12)

NAME M.J. Snyder, Shift Technical Advisor	TELEPHONE NUMBER
	AREA CODE
	4 0 7 4 6 5 - 3 5 5 0

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO					

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

At 0110 on June 14, 1990, St. Lucie Unit 1 was operating at 100% power when Utility Licensed Operators received indications of a dropped Control Element Assembly: CEA # 8. Operators matched turbine load to reactor power at 84%. A Reactor Engineer was called in to monitor core parameters. Following an operability check, the CEA was withdrawn at 0157. The CEA dropped fully into the core again at 0332, and the unit was stabilized at 70% power. Utility maintenance personnel (I&C) were called out to assist. On two later occasions, 0557 and 0653, CEA # 8 dropped fully into the core after having been fully withdrawn after specific maintenance repairs had been accomplished. At 0653, during the last drop of CEA # 8, a unit shutdown from 45% power was commenced in accordance with the plant's Technical Specifications. An Unusual Event was declared at 0657, due to a Tech Spec required shutdown, and the event was terminated at the completion of the shutdown at 0803. The unit was brought back on line at 2010 on 14 June, 1990.

The cause of this event was due to a personnel error in the installation of a power supply fuse in the CEA +12v DC logic circuit which was not locked in place and caused intermittent power losses. A contributing factor is that the location of the fuse makes it difficult to distinguish if the fuse is locked in place or just pushed in. Corrective Actions: 1) The unit was stabilized after each rod drop, 2) The loose fuse was locked in place and all other similar fuses were checked, 3) Onsite I&C personnel were made aware of this event, and 4) This event will be evaluated for use in the Maintenance and Operator Training Programs.

FACILITY NAME (1) ST. LUCIE, UNIT 1	DOCKET NUMBER (2) 0500033590	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		00	008	00	02	OF	03

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

DESCRIPTION OF THE EVENT:

On June 14, 1990, St. Lucie Unit 1 was operating at 100% power with no tests, maintenance or surveillances in progress. At 0110, Utility Licensed Operators received indications of a dropped Control Element Assembly (EIS:AA): CEA # 8. The operators used diverse indications to confirm that it was not an indication problem, and that the CEA had dropped fully into the core. Operators took the immediate actions of ensuring that the Control Element Drive Motor Control Panel was turned Off, and matched turbine load to reactor power. Reactor power and turbine load were matched to 84% power and stabilized at 0122. Operators made the assessment that the CEA was operable and successfully withdrew the CEA to its Upper Electrical Limit (UEL) at 0157. A Reactor Engineer monitored the core's physics parameters via the incore detectors (EIS:IG) to verify power operation remained within limitations.

At 0332, CEA # 8 again dropped fully into the core. At 0407, reactor power and turbine load were stabilized at 70 %. Utility Instrumentation & Control (I&C) maintenance personnel then made routine adjustments to the timer card module and the Upper Gripper voltage for Control Element Drive Motor (CEDM) #8 (EIS:AA). At 0526, CEDM #8 was fully withdrawn to its UEL. Upper gripper coil voltage traces appeared normal.

At 0557, CEA # 8 dropped fully into the core for the third time. Operators matched turbine load and reactor power at 54 %. I&C monitoring equipment showed that the Upper Gripper voltage had been momentarily lost and was the cause of the rod drop. I&C personnel then replaced the CEDM's Timer Module and Power switch, which control Upper Gripper voltage. At 0630, the rod was raised to its UEL. All CEDM coil traces appeared normal.

At 0653, CEA # 8 dropped fully into the core, again due to a loss of Upper Gripper voltage. Reactor power and turbine load were stabilized at 45% power. Since the root cause of the failure was not apparent, and in accordance with Technical Specification 3.1.3.1 on Control Element Assemblies, CEDM was declared inoperable and a unit shutdown was commenced. At 0657, St. Lucie Unit 1 declared an Unusual Event due to a shutdown required by Tech Specs. The shutdown was completed and the Unusual Event was terminated at 0803.

The loose fuse was reinstalled for CEDM # 8 , and the unit was brought back online at 2010 on 14 June, 1990. There was no other inoperable equipment which contributed to this event.

CAUSE OF THE EVENT:

The cause of this event was due to a personnel error in the improper installation of a 120v AC fuse in the 12 VDC logic circuitry for CEDM # 8's Timer Module. The fuse should have been locked into place, but instead was just pushed in to provide electrical continuity. Over time, the fuse ceased to assure electrical continuity. Maintenance records did not indicate when the fuse was last removed; therefore, the time of the improper installation could not be pinpointed. Contributing factors and an unusual characteristic of the work location is that a pushed in fuse visually appears to be similar to a locked in fuse, and that the fuse is located in a hard to reach position.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) ST. LUCIE, UNIT 1	DOCKET NUMBER (2) 05000335	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		90	008	00	03	OF	03

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

ANALYSIS OF THE EVENT:

This event is considered to be reportable under 10CFR50.73(a)(2)(i)(A) as the completion of any nuclear plant shutdown required by that plant's Technical Specifications.

The plant response to this event was normal. All systems functioned as expected, and Licensed Operators took prompt action to mitigate any possible consequences. A Reactor Engineer was present after the first CEA drop, and monitored the core's peaking factors, flux tilt, and linear heat rate to ensure that no limitations were exceeded during this event or during the subsequent startup. At no time during this event was reactor shutdown margin compromised.

This event was similar to that analysis described in Section 15.2.3 of the Unit 1 FUSAR, which assumes a full length CEA drop into the core without any operator actions. The actual plant response was more conservative than that described in the analysis for several reasons: 1) The St. Lucie Plant does not permit automatic CEA withdrawal, 2) The reactor was not permitted to return to full power, but rather turbine load was reduced to match reactor power.

Thus, the health and safety of the public was not endangered at any time during this event.

CORRECTIVE ACTIONS:

- 1) Licensed Operators stabilized the unit each time the CEA was dropped.
- 2) I&C personnel determined the cause of the event to be a loose fuse.
- 3) The fuse responsible for the event was locked in place, and all other similar fuses were verified to be locked in place.
- 4) All other onsite Utility I&C Specialists were made aware of the cause of this event.
- 5) The particulars of this event will be evaluated by the onsite Training department for incorporation into the Utility Maintenance and Licensed Operator Requalification Training program.
- 6) Consideration is being given to the use of match marks on the CEA circuitry fuses and fuseholders to aid in the visual inspections of these components.

ADDITIONAL INFORMATION:

COMPONENT FAILURES

NONE

PREVIOUS SIMILAR EVENTS

LER 389-85-010 describes a Reactor shutdown required due to an inoperable CEA.

LER 389-89-007 describes a Manual Reactor trip resulting from multiple dropped rods due to unrelated equipment failures.

