

# ACCELERATED DOCUMENT DISTRIBUTION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9307010013      DOC. DATE: 93/06/24      NOTARIZED: NO      DOCKET #  
FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co.      05000335  
AUTH. NAME      AUTHOR AFFILIATION  
WACHTEL, M.B.      Florida Power & Light Co.  
SAGER, D.A.      Florida Power & Light Co.  
RECIP. NAME      RECIPIENT AFFILIATION

SUBJECT: LER 93-005-00: on 930529, discovered that one CEA of dual element/control element drive mechanism potentially unlatched. Possibly caused by personnel error. CEA relatched & latching procedure modified. W/930624 ltr.

DISTRIBUTION CODE: IE22T      COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5  
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	
	PD2-2 LA	1 1	PD2-2 PD	1 1	
	NORRIS, J	1 1			
INTERNAL:	ACNW	2 2	ACRS	2 2	
	AEOD/DOA	1 1	AEOD/DSP/TPAB	1 1	
	AEOD/ROAB/DSP	2 2	NRR/DE/EELB	1 1	
	NRR/DE/EMEB	1 1	NRR/DORS/OEAB	1 1	
	NRR/DRCH/HHFB	1 1	NRR/DRCH/HICB	1 1	
	NRR/DRCH/HOLB	1 1	NRR/DRIL/RPEB	1 1	
	NRR/DRSS/PRPB	2 2	NRR/DSSA/SPLB	1 1	
	NRR/DSSA/SRXB	1 1	REG FILE 02	1 1	
	RES/DSIR/EIB	1 1	RGN2 FILE 01	1 1	
EXTERNAL:	EG&G BRYCE, J.H	2 2	L ST LOBBY WARD	1 1	R
	NRC PDR	1 1	NSIC MURPHY, G.A	1 1	
	NSIC POORE, W.	1 1	NUDOCS FULL TXT	1 1	I

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 504-2065) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

FULL TEXT CONVERSION REQUIRED  
TOTAL NUMBER OF COPIES REQUIRED: LTTR 32 ENCL 32

R  
I  
D  
S  
/  
A  
D  
D  
S  
/  
A  
D  
D  
S

AO-4  
dep



P.O. Box 128, Ft. Pierce, FL 34954-0128

June 24, 1993

L-93-164  
10 CFR 50.73

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

Re: St. Lucie Unit 1  
Docket No. 50-335  
Reportable Event: 93-05  
Date of Event: May 30, 1993  
Shutdown Required by Technical Specifications due to an  
Unlatched Control Element Assembly Caused by Personnel Error

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*

By *H.G. Boring*  
D. A. Sager  
Vice President  
St. Lucie Plant

DAS/JJB/kw

Attachment

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

DAS/PSL #942-93

290016

9307010013 930624  
PDR ADOCK 05000335  
S PDR



an FPL Group company

*TK22*  
11

# LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 56.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-532), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) <b>St. Lucie Unit 1</b>	DOCKET NUMBER (2) <b>051010335</b>	PAGE (3) <b>1 OF 4</b>
--	---------------------------------------	---------------------------

TITLE (4) **Shutdown Required By Technical Specifications Due To An Unlatched Control Element Assembly Caused By Personnel 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	09	93	93	005	00	06	24	93	N/A		0151010111
									N/A		0151010111

OPERATING MODE (9) <b>2</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more of the following) (11)						
POWER LEVEL (10) <b>000</b>	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	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)		OTHER (Specify in Abstract below and in Text NRC Form 366A)
	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 <b>Michael B. Wachtel, Shift Technical Advisor</b>	TELEPHONE NUMBER
	AREA CODE <b>407</b>
	<b>465-3550</b>

**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)	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)**

Unit 1 had just completed a scheduled refueling outage and was taken critical at 0430 on May 29, 1993 in preparation for low power physics testing. During the physics testing, core neutron flux asymmetries were identified that indicated one control element assembly (CEA) of dual element control element drive mechanism (CEDM) # 7 was potentially unlatched. Subsequent computer analysis and flux distribution modeling confirmed an unlatched inboard element of CEDM #7 as the most probable cause of the observed flux distributions. A controlled reactor shutdown was completed to satisfy requirements of Unit 1 CEA misalignment Technical Specification 3.1.3.1.f. The reactor was disassembled and ensuing inspections confirmed that the inboard element of CEDM #7 was unlatched.

The most likely root cause of this event was due to personnel error on the part of contractor and plant personnel in not adequately executing CEA latching. Contractor personnel performing the latching may not have correctly evaluated the full engagement of both CEA's. Additionally, post-latching verification as indicated by the extension shaft pin position may have been inadequately performed. Both of these checks could have alerted the personnel that the CEA was not fully latched. Contributing factors include inadequate procedural guidance on methods of ensuring proper latching, human factors concerns in performing the indicator pin verifications, and lack of independent verification of position indicator pin location.

The corrective actions taken include: 1) CEDM #7 was inspected for damage, none was observed, and the CEA was relatched. 2) Contractor and operations personnel training and certification on the implementation of the latching procedure will be improved. 3) The CEA latching procedure is being modified to ensure proper latching. 4) Post-latching inspections will be enhanced to reinforce independent latching verification.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION  
REQUEST: 16.3 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS  
AND REPORTS MANAGEMENT BRANCH (P-335), U.S. NUCLEAR REGULATORY COMMISSION,  
WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0184), OFFICE  
OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  St. Lucie Unit 1	DOCKET NUMBER (2)  05000335	LER NUMBER (6)			PAGE (3)	
		YEAR 93	SEQUENTIAL NUMBER 005	REVISION NUMBER 00	02	OF 04

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

**DESCRIPTION OF THE EVENT**

Unit 1 had just completed a scheduled refueling outage and was conducting low power physics testing. The reactor (EISS: RCT) was taken critical at 0421 on 29 May, 1993. Technical Specifications (TS) 3.1.1.4, 3.1.3.1, 3.1.3.5, and 3.1.3.5 were suspended in accordance with Operating Procedure (OP) 0110059, Suspension of Group Height, Insertion, and Power Distribution Limits and TS 3.10.2 and 3.10.5, Special Test Exceptions. These documents suspend limitations on moderator temperature coefficient, control element assembly (CEA) (EISS: AA) misalignment, and power dependent insertion limits during testing. At 0615, low power core physics testing commenced in accordance with Pre-Operational Procedure (POP) #3200091, Reactor Startup Physics Testing. This test is used to verify that the reactor core operating characteristics are consistent with design predictions, and to provide assurance that the reactor can be operated as designed.

One of the initial areas of testing is the determination that the dual CEA's of shutdown groups A and B provide a maximum average reactivity differential of +/- 15 pcm between the CEA's in their group. This is done by alternating CEA's in and out of the core and comparing their reactivity worth to each other. This test provides positive indication that there are no unlatched CEA's in the group.

The initial test with Control Element Drive Mechanism (CEDM) (EISS: AA) #7 yielded a typical asymmetry of about 1 pcm. The check immediately following produced an unexpected 39 pcm asymmetry. Extensive symmetry checks between CEDM #7 and other dual and single CEDM's throughout the core all yielded unsatisfactory results. The reactor core exhibited a suppressed power density in the location of CEDM #7, with a corresponding high power region in the opposite quadrant of the core. This data suggested that one of the two elements of CEDM #7 was unlatched.

Initial latching verification performed just after refueling and prior to core physics testing consisted of:  
1) Visual verification of extension shaft latch assembly pins to ensure full latching assembly engagement. A normal pin location was noted. 2) Load cell testing to determine if CEDM #7 was carrying the full weight of both CEA's. This indicated both CEA's were attached. 3) Rod drop time testing which showed that at least one of the two CEA's was latched. Results of these initial latch verifications and subsequent core physics testing suggested that both CEA's of CEDM #7 were initially attached, but one element had become unlatched during core physics testing.

In an attempt to verify observed physics testing data, computer generated models were used to simulate flux distributions for dual and single unlatched CEA's at various suspect regions of the core. An unlatched inboard CEA from dual element CEDM #7 gave the best agreement with measured results from symmetry checks performed during low power physics testing.

In accordance with TS 3.1.3.1, the reactor was shutdown, and disassembled for inspection. Subsequent control element extension shaft height measurements, CEA total weight testing, and video inspection confirmed the inboard element of CEDM #7 was unlatched.

After confirming no damage had occurred, the unlatched CEA was relatched using upgraded verification procedures. Visual pin position verification was confirmed on all other CEA's. The reactor vessel was re-assembled and a normal plant startup was commenced on 11 June, 1993.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION  
REQUEST: 80 9 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS  
AND REPORTS MANAGEMENT BRANCH (P-555), U.S. NUCLEAR REGULATORY COMMISSION,  
WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE  
OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  St. Lucie Unit 1	DOCKET NUMBER (2)  05000335	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		93	005	00	03	OF 04

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

**CAUSE OF THE EVENT**

The inboard element of CEDM #7 came unlatched from dual extension shaft #7 because the gripper assembly was not fully engaged during the initial latching process. The gripper and CEA hub assemblies were held together by partial latching or frictional contact that eventually allowed the CEA to slip off after several CEDM manipulations.

The most likely root cause of this event was due to personnel error on the part of contractor and plant personnel in not adequately executing CEA latching. Latching has been successfully performed many times in the past by relying on the contractor specialists' training, expertise, and procedural compliance. Contractor personnel performing the latching may not have correctly evaluated the full engagement of both CEAs on CEDM #7. Additionally, post-latching verification as indicated by the extension shaft pin position may have been inadequately performed by contractor personnel and utility licensed operators. Both of these checks could have alerted the personnel that the CEA was not fully latched. Contributing factors include inadequate procedural guidance on methods of ensuring proper latching, human factors concerns in performing the indicator pin verifications, and lack of independent verification of position indicator pin location.

**ANALYSIS OF THE EVENT**

This event is reportable to the Nuclear Regulatory Commission under 10 CFR 50.73.a.2.i.A as "The completion of a shutdown required by Technical Specifications." Additionally, 10 CFR 50.72.b.1.i.A requires a 1 hour notification be made to the NRC Operations Center.

Technical Specification 3.1.3.1.f.2.a requires that with one full-length CEA misaligned from any other CEA in its group by 15 or more inches beyond delineated time constraints, reduce reactor power to less than or equal to 70% then declare the CEA inoperable and satisfy shutdown margin requirements. Operation in modes 1 or 2 may continue pursuant to CEA insertion limits provided that within one hour the remainder of the CEAs in that group are aligned to within 7.5 inches of the inoperable CEA while maintaining allowable CEA sequence and insertion limits. Compliance with this specification for given conditions necessitated a full reactor shutdown.

The basis of this Technical Specification is to ensure that 1) acceptable power distribution limits are maintained, 2) Minimum shutdown margin is maintained, 3) potential effects of an ejected CEA are acceptable. Due to the sustained low reactor power level, operating constraints delineated by the low power physics testing procedure, and the ability of all CEAs to perform their intended safety function, design reactor operating parameters were not jeopardized. Therefore, the health and safety of the public was not affected by this event.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION  
REQUEST: 26.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS  
AND REPORTS MANAGEMENT BRANCH (P-533), 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 1	DOCKET NUMBER (2)  05000335	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		93	005	00	04	OF 04

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

**CORRECTIVE ACTIONS**

- 1) A detailed inspection was performed to capture the as-found condition of CEDM #7 and verify its latched status.
- 2) Both CEA's of CEDM #7 were relatched and verified to be properly latched. The reactor was re-assembled and taken critical on 6/11/93.
- 3) OP 1(2)-0110022, Coupling and Uncoupling of CEA Extension Shafts, will be upgraded by Operations to provide increased assurance of proper CEA latching. Changes being considered include:
  - a) Determining CEA extension shaft elevation measurements to verify the post-latched position.
  - b) Recording latching tool indicator position as an additional confirmation of position indicator pin location.
  - c) Ensuring that sufficient slack exists in the latching tool cables while withdrawing gripper plungers. This would prevent restraining the drop of the extension shaft assembly and enable complete engagement of the gripper assembly. Though not acknowledged as a contributing factor in this event, it may prevent future occurrences.
- 4) Human factors improvements to the position indicator pin verifications will include:
  - a) Additional lighting to assist position indicator pin verification.
  - b) Independent verification of position indicator pin location.
- 5) Training of contractor and plant personnel on the proper implementation of the latching and verification procedures will be improved.

**ADDITIONAL INFORMATION**

**Failed Component Identification:**

There were no component failures associated with this event.

**Previous Similar Events:**

There are no previous LER's related to this event.