

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9208110365 DOC.DATE: 92/08/07 NOTARIZED: NO DOCKET #  
 FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389  
 AUTH.NAME AUTHOR AFFILIATION  
 SIENKIEWICZ,S. Florida Power & Light Co.  
 SAGER,D.A. Florida Power & Light Co.  
 RECIPIENT NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-004-00:on 920708,reactor manually tripped due to low  
 SG water level.Caused by failed lead/lag circuit in  
 feedwater regulating valve sys.Design change will delete  
 circuits from SG water level circuitry.W/920807 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 4  
 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/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
	REG <del>FILE</del> 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
	NRC PDR	1 1	NSIC MURPHY,G.A	1 1
	NSIC POORE,W.	1 1	NUDOCS FULL TXT	1 1

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK,  
 ROOM P1-37 (EXT. 20079) TO ELIMINATE YOUR NAME FROM DISTRIBUTION  
 LISTS FOR DOCUMENTS YOU DON'T NEED!



August 7, 1992

L-92-209  
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: 92-004  
Date of Event: July 8, 1992  
Manual Reactor Trip due to  
Low "A" Steam Generator Level

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*

*B. H. J. Basing*

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 #737-92

9208110365 920807  
PDR ADOCK 05000389  
S PDR

*[Handwritten signature]*

**LICENSEE EVENT REPORT (LER)**

ESTIMATED BURDEN FOR RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: SEE FPIA, FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-338), 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) 050003891	PAGE (3) 1 OF 3
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TITLE (4) Manual reactor trip due to low (A) Steam Generator Water level caused by a failed circuit in the 2A Feedwater Regulating valve control system

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)
07	08	92	92	004	00	08	07	92	N/A		0151010111
									N/A		0151010111

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) 100	20.402(b)	20.405(c)	X	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)	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 Scott W. Sienkiewicz, Shift Technical Advisor	TELEPHONE NUMBER AREA CODE 407 465-3550
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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
X	J B	C A P	R 3 3 5	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)

On July 8, 1992 at 1134 hours with St. Lucie Unit 2 in mode 1 at 100% power, the reactor was manually tripped due to low (A) Steam Generator water level. Standard Post Trip Actions were performed as per EOP-1. Normal Steam Generator water levels were regained, two sets of safety function status checks were performed as per EOP-2 Reactor Trip Recovery and the plant was stabilized in Mode 3, Hot Standby.

The root cause of the reactor trip was a failed Lead /Lag circuit in the 2A Feedwater Regulating valve control system, which initiated the level transient of the 2A Steam Generator. The purpose of the Lead/Lag circuit is to provide fast initial valve response to a Steam Generator water level step change.

Corrective Actions for this event: 1) The Lead /Lag circuitry for the 2A Steam Generator Feedwater Regulating Valve Control System was removed from service after an engineering evaluation identified that the Lead/Lag circuitry had a negligible compensation effect. 2) A final design change by FP&L Engineering will address a possible permanent deletion of the Lead/Lag circuits from the Steam Generator water level control circuitry or a new replacement for both Units 1 and 2. 3) A review of other single point vulnerabilities related to this type of component failure in the Feedwater and Condensate systems will be performed by Technical Staff and I&C Maintenance. 4) Extensive simulator training was previously performed utilizing a Loss of Main Feedwater scenario. However, the Training Department will evaluate this specific event for inclusion into the Licensed Operator requalification program.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION  
REQUEST: SEE NRC'S FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS  
AND REPORTS MANAGEMENT BRANCH (P-308), U.S. NUCLEAR REGULATORY COMMISSION,  
WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0114), 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	004	00	02	OF 03

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

**DESCRIPTION OF THE EVENT**

On July 8, 1992 at 1134 hours with St. Lucie Unit 2 in mode 1 at 100% power, the reactor was manually tripped due to low "A" Steam Generator (S/G) water level. Prior to the manual trip, the control room Operators received an "A" Steam Generator high level alarm and observed S/G water level rising rapidly. The "A" Feedwater regulating valve controller (EIS: JB) appeared to have failed with zero indicated level input and controller output signals. When the Steam Generator water level reached the high level setpoint the Feedwater regulating valve automatically closed. The Steam Generator water level then began rapidly decreasing. When Steam Generator water level approached the automatic low level trip setpoint the reactor was tripped. Standard Post Trip Actions were performed as per EOP-1. Normal Steam Generator water levels were regained, two sets of safety function status checks were performed as per EOP-2 Reactor Trip Recovery and the plant was stabilized in Mode 3, Hot Standby.

**CAUSE OF THE EVENT**

Troubleshooting of the 2A Feedwater Regulating Valve Control System by I&C personnel showed that the Steam Generator water level Lead/Lag circuit output current was low and not responsive to the applied input current. Inspection of the circuit revealed that one of the three power supply filter capacitors was distorted. The circuit board appeared to be discolored in the area of the power supply due to heating. Bench testing indicated the power supply output voltages were incorrect and several voltage dropping resistors were hot indicating excessive current draw. No other discrepancies were noted. The root cause of the event appears to be an aging related failure of the power supply filter capacitor.

**ANALYSIS OF EVENT**

This event is reportable under 10CFR 50.73.a.2.iv as "any event or condition that resulted in manual or automatic actuation of any engineered safety feature, including the reactor protection system." The Assistant Nuclear Plant Supervisor directed Licensed Operators to manually trip the reactor in anticipation of an automatic RPS actuation, with the "A" Steam Generator water level at 30% narrow range and rapidly decreasing.

The plant response to this event was bounded by the accident analysis of the St. Lucie Unit 2 FUSAR, section 15.2, "Decreased Heat Removal by the Secondary System". The actual plant response was much more conservative because of the following:

- 1) Only one Feedwater Regulating Valve closed in this event, instead of the total loss of normal feedwater.
- 2) The reactor was manually tripped due to low 2A Steam Generator water level. In the accident analysis, the reactor is assumed to trip on high pressurizer pressure.

The purpose of the Lead/Lag circuit is to provide fast initial valve response to a Steam Generator water level step change. All plant safety functions were met and there were no additional complications. The Auxiliary Feedwater Actuation System and the Steam Bypass Control System functioned as required during this event. The plant response during the reactor trip was observed to be normal for the given conditions. Consequently, the health and safety of the public were not affected by this event.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION  
REQULRE BY: 543 FPM, FORWARD COMMENTS TO THE RECORDS  
AND REPORTS MANAGEMENT BRANCH (P-408), U.S. NUCLEAR REGULATORY COMMISSION,  
WASHINGTON, DC 20548, 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	SEQUENTIAL NUMBER	REVISION NUMBER			
		92	004	00	03	OF	03

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

**CORRECTIVE ACTIONS**

- 1) The Lead /Lag circuitry for the 2A Steam Generator Feedwater Regulating Valve Control System was removed from service after an engineering evaluation identified that the Lead/Lag circuitry had a negligible compensation effect.
- 2) A final design change by FP&L Engineering will address a possible permanent deletion of the Lead/Lag circuits from the Steam Generator water level control circuitry or a new replacement for both Units 1 and 2 before their next refueling outage. .
- 3) A review of other single point vulnerabilities related to this type of component failure in the Feedwater and Condensate systems will be performed by Technical Staff and I&C Maintenance.
- 4) Extensive simulator training was previously performed utilizing a Loss of Main Feedwater scenario. However, the Training Department will evaluate this specific event for inclusion into the Licensed Operator requalification program.

**ADDITIONAL INFORMATION**

Failed Component Identification

The Lead/Lag circuit (Rochester, model # XSC-306-77698) in the 2A Feedwater Regulating valve control system.

Previous Similar Events

<u>LER#</u>	<u>DESCRIPTION</u>
1) 335-88-03-00	Reactor trip on low Steam Generator level due to Main Feed Regulating valve equipment failure.
2) 335-88-08-00	Reactor trip on low Steam Generator water level due to inadvertent closure of a Main Feedwater Regulating valve.