

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8706300862 DDC DATE: 87/06/20 NOTARIZED: NO DOCKET #
 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
 AUTH. NAME AUTHOR AFFILIATION
 MENDOZA, V. N. Florida Power & Light Co.
 WOODY, C. D. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-011-00: on 870521, turbine generator lockout relay trip occurred resulting in automatic turbine trip. Caused by increase in exciter field current due to failed transducer. Faulty wires repaired & transducer replaced. W/870622 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73 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
	TOURIGNY, E	1	1			
INTERNAL:	ACRS MICHELSON	1	1	ACRS MOELLER	2	2
	AEOD/DOA	1	1	AEOD/DSP/ROAB	2	2
	AEOD/DSP/TPAB	1	1	DEDRO	1	1
	NRR/DEST/ADE	1	0	NRR/DEST/ADS	1	0
	NRR/DEST/CEB	1	1	NRR/DEST/ELB	1	1
	NRR/DEST/ICSB	1	1	NRR/DEST/MEB	1	1
	NRR/DEST/MTB	1	1	NRR/DEST/PSB	1	1
	NRR/DEST/RSB	1	1	NRR/DEST/SGB	1	1
	NRR/DLPQ/HFB	1	1	NRR/DLPQ/QAB	1	1
	NRR/DOEA/EAB	1	1	NRR/DREP/RAB	1	1
	NRR/DREP/RPB	2	2	NRR/PMAS/ILRB	1	1
	NRR/PMAS/PTSB	1	1	REG FILE 02	1	1
	RES DEPY GI	1	1	RGN2 FILE 01	1	1
EXTERNAL:	EG&G GROH, M.	5	5	H ST LOBBY WARD	1	1
	LPDR	1	1	NRC PDR	1	1
	NSIC HARRIS, J	1	1	NSIC MAYS, G	1	1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 42 ENCL 40

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) St. Lucie Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 3 5 1	PAGE (3) 1 OF 0 4
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TITLE (4) REACTOR TRIP RESULTING FROM A TURBINE GENERATOR LOCKOUT TRIP CAUSED BY EQUIPMENT FAILURE

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 5	2 1	8 7	8 7	0 1 1	0 0	0 6	2 0	8 7	N/A		0 5 0 0 0																								
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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)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)			73.71(b)		
	20.406(a)(1)(i)			50.36(e)(1)			50.73(a)(2)(v)			73.71(c)		
	20.406(a)(1)(ii)			50.36(e)(2)			50.73(a)(2)(vi)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
	20.406(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)					
	20.406(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)					
	20.406(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(ix)					

LICENSEE CONTACT FOR THIS LER (12)											
NAME Victor N. Mendoza, Shift Technical Advisor								TELEPHONE NUMBER AREA CODE: 3 0 5 4 6 5 - 3 5 5 0			

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	T L	T D	W 1 2 0	N							

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)

ABSTRACT

While St. Lucie Unit 1 was in Mode 1 and at steady state conditions, the reactor tripped by virtue of the loss of turbine load trip. A turbine lockout trip was initiated by the tripping of the generator lockout relay by the overexcitation protection limiter. The cause of the event was due to an increase in exciter field current which exceeded the setting of Instantaneous Current Limiter #3 which directly gives a generator lockout. The root cause of the exciter field current increase was a failed transducer. Immediate actions were performed to bring the reactor to a stable condition. Two defective wires were repaired, the failed transducer was replaced, and the current limiter was re-set to its specified setting.

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

DESCRIPTION OF THE EVENT

On May 21, 1987, St. Lucie Unit I was in Mode 1 and steady state conditions. All systems were functioning normally. All major control stations were in automatic mode with the exception of the turbine controls and the atmospheric steam dumps which were in manual mode. At approximately 1504 hours, a turbine generator (EIIS:TB) lockout relay trip occurred and resulted in an automatic turbine trip. The Reactor Protection System (RPS) functioned as designed providing an automatic reactor trip signal on loss of load. Operations personnel performed all the required immediate actions necessary to bring the plant to a stable condition. All safety functions were met. Auxiliary Feed Water Pumps 1A, 1B, and 1C were manually started to ensure that steam generator levels were maintained. This event was observed to be an uncomplicated reactor trip.

CAUSE OF THE EVENT

The cause of the event was due to an increase in exciter (EIIS:TL) field current reaching the Instantaneous Current Limiter #3 setting resulting in a turbine generator lockout trip. The Instantaneous Current Limiters IL#1, IL#2 and IL#3 are part of the newly installed high initial response exciter system.

During the initial investigation by plant electrical maintenance, plant operations, and site Westinghouse personnel, a potential cause was found in that the cover of a current transformer had pinched one wire lead and that another wire lead was worn to a bare wire condition. The pinched and the bare wires could have caused the signal to the current transformer to be degraded giving a false indication of low current or no current. The Minimum Excitation Limiter (MEL) would respond by providing an increase in field current thus resulting in the transient. It was also found that the setting of the Instantaneous Current Limiter #2 was incorrectly set at a higher setting than Instantaneous Current Limiter #3. As designed, the setting for IL#2 should be at a setting lower than IL#3 to provide a limiting action before IL#3 trips the generator. The wiring deficiencies were the result of cognitive personnel error by contractor technicians and the incorrectly set current limiter was the result of cognitive personnel error by generator vendor technicians. There were no procedure deficiencies or unusual characteristics of the work location that directly contributed to the errors.

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

The wiring deficiencies were corrected and the current limiter was readjusted. After the corrective actions were performed, it was concluded that it would be necessary to return to power to perform additional testing to further confirm the root cause of the event. The unit was then returned to full power operation on May 23, 1987. After the unit was at full power, at approximately 1131 on May 24, 1987, oscillations on megawatt, megavar, and kilovolt recorders and indicators were observed. Further troubleshooting was then performed. The voltage regulator was placed in manual to minimize the potential of further transients. An on-line recorder was connected to various signals inside the voltage regulator. This monitoring effort revealed the actual root cause to be an intermittent equipment failure of an exciter current isolation transducer. A new transducer was obtained from plant stores and was calibrated prior to replacement. On May 30, 1987, the defective transducer was replaced.

ANALYSIS OF THE EVENT

The event is reportable under 10 CFR 50.73 (a) (2) (iv), "Any event or condition that results in manual or automatic actuation of any engineered safety feature (ESF), including the Reactor Protection System (RPS)". This event was a classic loss of load reactor trip and as such is conservatively bounded by the analysis of Updated Final Safety Analysis Report chapter 15.2.7, "Loss of external electrical load and/or turbine stop valve closure."

The trip was observed to be uncomplicated and all safety functions were met. At no time during the event was the health and safety of the public endangered.

CORRECTIVE ACTIONS

1. The defective wire leads on the current transformer were repaired.
2. Instantaneous Current Limiter IL#2 was readjusted to the correct setting.
3. The defective transducer was replaced.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

ADDITIONAL INFORMATION

Failed Component Identification:

Isolation Transducer:

Style No. 688C563G01

Manufacturer: Westinghouse Electric Corporation

PREVIOUS SIMILAR EVENT

This is the first time a failure of this type of transducer has occurred in St. Lucie Plant.



JUNE 22 1987

L-87-260

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

Gentlemen:

Re: St. Lucie Unit No. 1
Docket No. 50-335
Reportable Event: 87-11
Date of Event: May 21, 1987
Reactor Trip Resulting From a Turbine Generator
Lockout Trip Caused by Equipment Failure

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,

C. O. Woody
Group Vice President
Nuclear Energy

COW/GRM/gp

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

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