

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8802230053 DDC. DATE: 88/02/19 NOTARIZED: NO
 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co.
 AUTH. NAME AUTHOR AFFILIATION
 MOHN, S. E. Florida Power & Light Co.
 WOODY, C. O. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

DOCKET #
05000335

SUBJECT: LER 87-013-01: on 870614, 1B steam generator feed pump tripped & initiated main turbine runback. Cause may have been due to failure of differential current relay. Unit stabilized in hot standby. W/880218 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/NAS	1 1
	AEOD/DSP/ROAD	2 2	AEOD/DSP/TPAB	1 1
	ARM/DCTS/DAB	1 1	DEDRO	1 1
	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/DRIS/SIB	1 1	NRR/PMAS/ILRB	1 1
	<u>REG FILE</u> 02	1 1	RES TELFORD, J	1 1
	RES/DE/EIB	1 1	RES/DRPS DIR	1 1
	RGN2 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	FORD BLDG HOY, A	1 1
	H ST LOBBY WARD	1 1	LPDR	1 1
	NRC PDR	1 1	NSIC HARRIS, J	1 1
	NSIC MAYS, G	1 1		

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) St. Lucie, Unit 1						DOCKET NUMBER (2) 0 5 0 0 0 3 3 5			PAGE (3) 1 OF 4		
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TITLE (4)
REACTOR TRIP ON HIGH PRESSURE DUE TO TURBINE RUNBACK CAUSED BY LOSS OF 1B SGFP

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)																																																																														
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LICENSEE CONTACT FOR THIS LER (12)

NAME S. E. Mohn - Technical Staff						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 NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
B	E, A	8 7	W 1 2 0	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

ABSTRACT

On 14 June 1987, while operating at 100 percent power (Mode 1), St. Lucie Unit 1 experienced a main turbine runback to 60 percent power due to the loss of the 1B Steam Generator Feed Pump (SGFP). The utility licensed operators restarted the SGFP and manually inserted control rods to reduce the primary/secondary power mismatch. The unit automatically tripped on high pressure approximately 22 seconds into the event. The trip was uncomplicated and the unit was quickly stabilized in hot standby.

The cause of the 1B SGFP trip has not been conclusively identified; however, a failure of the differential current relay, type SA-1, in the 1B SGFP is believed to have been the cause. An upgrade has been installed in all Unit #2 and in one Unit #1 type SA-1 relays. The remaining upgrades for Unit #1 type SA-1 relays are on order.

The intention of the main turbine runback is to reduce the turbine steam load in response to the reduced feedwater flow and subsequent decrease in S/G inventories. It is not required for reactor safety. The Reactor Protection System will assure reactor safety by automatically tripping the unit and the main turbine on low S/G level or high pressure as it did in this event. This will assure sufficient S/G inventories to provide an adequate primary heat sink. At no time during this event were the 1A SGFP or auxiliary feed water system affected.

1622 1/1

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

DESCRIPTION OF EVENT

On 14 June 1987, St. Lucie Unit One was operating at 100 percent power steady state in Mode 1. There were no evolutions nor were there any surveillances in progress. All automatic controllers were in automatic with the exception of the Control Rod Drive System (EIIS:JD) which was in "OFF". The Steam Bypass Control System (EIIS:JI) was in automatic with one of the five bypass valves isolated due to seat leakage.

At 2350 hours, the 1B Steam Generator Feed Pump (SGFP) (EIIS:SJ) tripped and initiated a main turbine runback (EIIS:JJ) to 60 percent power. The utility licensed operators having been alerted to the event by various annunciator alarms (EIIS:IB) restarted the 1B SGFP and manually inserted control rods (EIIS:AA) to reduce reactor (EIIS:AC) power. Primary temperature and pressure were rising rapidly due to the increasing power mismatch caused by the main turbine runback.

The main turbine runback was stopped when the operators restarted the 1B SGFP approximately 11 seconds after it initially tripped. The operators continued to insert the control rods to reduce the reactor power level and thereby minimize the primary temperature and pressure surge. However, the power mismatch was too severe and the unit automatically tripped (EIIS:JC) on high pressurizer (EIIS:AB) pressure at 2400 psia approximately 22 seconds into the event.

The trip was an uncomplicated trip and all systems functioned normally. The Power Operated Relief Valves (PORV) (EIIS:AB) automatically lifted as designed at 2400 psia to reduce primary pressure and then resealed. The SBCS operated to reduce primary average temperature (T-avg) to the zero power setpoint of 532 degrees F. Auxiliary Feedwater Actuation System (AFAS) (EIIS:BA) actuated on low steam generator (S/G) level due to the shrink caused by the rapid post trip power reduction. The standard post trip actions were completed and the unit was quickly stabilized in hot standby (Mode 3).

CAUSE OF EVENT

The cause of the main turbine runback and the subsequent automatic reactor trip was the loss of the 1B SGFP. Following the unit trip the Electrical Department commenced extensive troubleshooting of the 1B SGFP motor, breaker (EIIS:EA), and associated SGFP control and protective circuits. No abnormalities were discovered. Subsequent failure of the 1B SGFP differential current relay on 18 October 1987, indicates that it was most likely the root cause of the 14 June 1987 trip. The failure mode was such that the relay failure was spurious, intermittent, and its actuation flag did not lock in. This explains the original difficulty in the detection of the root cause for the 14 June event.

R1

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		87	013	01	03	OF 04

TEXT (If more space is required, use additional NRC Form 368A's) (17)

ANALYSIS OF EVENT

This event is reportable under 10 CFR 50.73 (a)(2)(iv), "any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature, including the Reactor Protection System".

The temporary loss of the 1B SGFP resulted in a main turbine runback and a reduction in normal feedwater flow. The main turbine runback is initiated when one of the two running SGFPs trip and main turbine load, as measured by the main turbine's first stage pressure, is greater than 60 percent. The main turbine runback is not required for reactor safety. It is intended to reduce the main turbine steam demand in response to the reduced feed flow and subsequent decrease in S/G feedwater inventories. Had the main turbine runback failed to activate, the Reactor Protective System (RPS) (EIIS:JC) would have automatically tripped the reactor on low S/G level and then tripped the main turbine. This would have assured sufficient S/G feedwater inventories to provide an adequate heat sink for the primary system.

If the 1B SGFP had not been able to be restarted, the turbine runback would have continued until main turbine load was less than 60 percent. The RPS would have automatically tripped the reactor on either low S/G feedwater levels or on high pressurizer pressure as it did in this event. In both of the above trips the RPS would have also tripped the main turbine on reactor trip. Again, sufficient S/G feedwater inventories would have been available to provide an adequate primary heat sink.

At no time during this event was the normal feedwater flow from the 1A SGFP affected. The auxiliary feedwater system was also available during the entire event and was successfully actuated when the S/G levels decreased due to shrink following the trip.

The St. Lucie Unit 1 updated Final Safety Analysis Report (FSAR) has analyzed both the "Loss of Load" (15.2.7) and the "Loss of Feedwater Flow" (15.2.8) accidents and has determined that no violation of the reactor safety limits would occur. At no time during the event were the health and safety of the public endangered.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

CORRECTIVE ACTIONS

1. Following the trip the unit was stabilized in hot standby.
2. Upgrades for the Type SA-1 relay have been installed in all Unit #2 relays (6) and in one Unit #1 relay. Parts for the remaining Unit #1 relay upgrades (5) are on order.

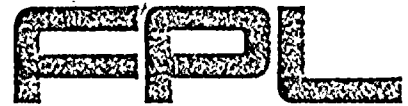
ADDITIONAL INFORMATION

1. Component Identification

Westinghouse Electrical Corp.
Type SA-1
Differential Current Relay

2. Previous Similar Events

See LER #335-87-10 for the previous reactor trip event.



FEBRUARY 18 1988

L-88-75
10 CFR 50.73

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

Gentlemen:

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 87-13 Revision 1
Date of Event: June 14, 1987
Reactor Trip on High Pressure
Caused by Loss of Steam Generator Feed Pump

The attached Licensee Event Report (LER) is being submitted pursuant to the requirements of 10 CFR 50.73 to provide an update on the subject event.

Very truly yours,

A handwritten signature in cursive script, appearing to read "C. O. Woody", is written over the typed name.

C. O. Woody
Executive Vice President

COW/GRM/gp

Attachment

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

GRM/021.LER

Handwritten initials "TK22" and the number "11" are written in the bottom right corner of the page.