The Light company
Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

January 29, 1992
ST-HL-AE-3836
File No.: G26
10CFR50.73

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

South Texas Project Electric Generating Station
Unit 2
Docket No. STN 50-499
Revision 01 to Licensee Event Report 91-007
Regarding Reactor Trip Caused By Inadvertent
Actuation of a Main Generator Breaker Emergency Trip

Reference: Original LER 91-007 transmitted by letter from William J. Jump to Document Control Desk, June 20, 1991 (ST-HL-AE-3795)

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 91-007) regarding a reactor trip caused by inadvertent actuation of a main generator breaker emergency trip. The revision corrects statements in the description of the event, and updates the status of corrective actions. Change bars are provided to highlight the changes. This event did not result in an adverse impact on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. C. A. Ayala at (512) 972-8628 or me at (512) 972-7205.

William J. Jump
Manager,
Nuclear Licensing

PLW/amp

Attachment: LER 91-007 Revision 1 (South Texas, Unit 2)

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Revised 10/11/91

L4/NRC/

NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
South Texas, Unit 2	0 5 0 0 0 4 9 9	1 OF 0 5

TITLE (4) Reactor Trip Caused By Inadvertent Actuation of Generator Breaker Emergency Trip

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 0 0 0
0 5	2 2	9 1	9 1	0 0 7	0 1	0 1	2 9	9 2		0 5 0 0 0

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)	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	TELEPHONE NUMBER
	AREA CODE
Charles Ayala - Supervising Licensing Engineer	5 1 2 9 7 2 - 8 6 2 8

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	
B	S B	R V	P 0 9 5	X							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On May 22, 1991, Unit 2 was in mode 1 at 100% power. At approximately 2220 hrs, while waiting in the area of the main generator breaker to unlock a local cabinet for an Electrical Maintenance individual, a non-licensed operator inadvertently actuated the local generator breaker emergency trip pushbutton. The sudden loss of secondary load caused an automatic over temperature delta temperature (OTΔT) reactor trip. Pressurizer spray was unable to reduce the pressure before the pressurizer PORVs opened at approximately 2335 psig. Steam generator 2C power-operated relief valve (PORV) failed to open even though the pressure exceeded the lift setpoint. The non-licensed operator responsible for the trip was counselled with regards to paying strict attention to performance of operations activities. The Steam Generator 2C PORV has been repaired. Other switch designs have been reviewed to identify changes that can prevent similar inadvertent actuations.

DESCRIPTION OF EVENT:

On May 22, 1991, Unit 2 was in mode 1 at 100% power. At approximately 2220 hours, a non-licensed operator waiting to unlock a local cabinet for an Electrical Maintenance craftsman inadvertently actuated the local generator breaker emergency trip pushbutton. The sudden loss of secondary load caused an automatic over-temperature delta temperature (OTΔT) reactor trip. The non-licensed operator immediately notified the Control Room of the cause of the breaker trip.

The transient caused RCS pressure to increase. Pressurizer spray valve 2-RC-PCV-0655C had been closed previously and placed in manual control; the available automatic spray valve was not able to reduce the pressure before the pressurizer PORVs opened at approximately 2335 psig. RCS pressure reached approximately 2350 psig.

Main Turbine Governor valves closed when the Generator Breaker was opened. This caused steam generator pressures to increase. Steam generator 2A, 2B, and 2D power-operated relief valves (PORVs) opened as expected at approximately 1225 psig. However, steam generator 2C PORV failed to open even though the lift setpoint pressure was exceeded. Steam generator pressure reached approximately 1285 psig (the lowest steam generator safety relief valve setpoint). The pressure did not exceed the allowable setpoint tolerance, so that none of the steam generator safety relief valves are believed to have opened.

Following the first Unit 2 refueling outage, pressurizer spray valve 2-RC-PCV-0655C began leaking excessively (approximately 10-15% valve position). The scope of the work required to repair the valve and the time available in the existing outage dictated that the rework be postponed until the next refueling outage. A caution tag was placed on the Main Control Board directing that the valve remain closed and in manual control. This contributed to the pressure transient that caused the pressurizer PORVs to open; however, given the magnitude of the transient (100% load rejection), the PORVs would probably have opened regardless of the pressurizer spray valve availability.

All other systems and components operated as expected, and the plant was stabilized in Mode 3. The NRC was notified of the event at 0044 on May 23, 1991.

CAUSE OF EVENT:

This event was caused by the following:

1. The non-licensed operator was inattentive while performing his duties.

2. Human error was not considered in design and location of the local generator breaker emergency trip pushbutton.

3. Previous corrective actions taken were not complete. Previous inadvertent actuation events resulted in identification of components that required additional barriers to inadvertent operation. The generator breaker emergency trip pushbutton should have been identified in these evaluations.

4. The cause of the failure of the steam generator PORV to actuate is attributed to iron particulates in the EHC fluid. During troubleshooting and repair of the PORV, an EHC fluid sample showed out-of-specification particulate contamination in each range. According to the vendor, the control valve is sensitive to particulate interference. No other anomalies were found.

ANALYSIS OF EVENT:

This event is reportable pursuant to 10CFR50.73(a)(2)(iv) as a Reactor Protection System actuation. The non-licensed operator was not performing duties associated with the generator breaker emergency trip button. Actuation occurred when he leaned against it.

CORRECTIVE ACTIONS:

The following corrective actions are being taken as a result of this event:

1. The non-licensed operator responsible for the trip was counselled by Plant Operations management on May 23, 1991, with specific instructions regarding paying strict attention to performance of operating activities.

2. The subject external pushbutton has been removed from local panels in both units. Local tripping of the main generator output breaker is still possible from inside the cabinets, but access requires opening a cabinet door to manipulate the trip button.

CORRECTIVE ACTIONS: (Cont'd)

3. A list of switches, pushbuttons, breakers, etc., that are considered to be susceptible to inadvertent operation leading to plant trips has been developed. The list addresses such switches, pushbuttons, breakers, etc., that were not identified in a previous review addressed by LER 87-013 (discussed below). Changes will be implemented as soon as possible, but not later than the next refueling outage of Unit 1. Unit 2 changes have been completed.

4. The EHC fluid in the steam generator 2C PORV was flushed, replaced, and verified acceptable by analysis. The PORV has been tested, and was declared operable at 0350 on May 25, 1991.

5. A program to determine the root cause of particulate contamination of steam generator PORV EHC fluid has been completed. The particulate matter found in a sample drawn on May 24 is primarily small iron particles resulting from erosion within the actuator.

6. As a result of the findings the root cause evaluation noted in item 5 above, the following preventive measures have been put in place:

   a. If the oil is found to be out-of-specification for particulates, the oil will either be changed out or the oil will be purified.

   b. The in-line filtration will be changed from 10 microns to <5 microns. The change is expected to be implemented by June 30, 1992.

   c. The PORV's will be stroked monthly to maintain operability (following change in filtration).

   d. The PORV actuators will be disassembled and inspected at the next available refueling outage for Unit 1 (Fall, 1992). This has been completed for Unit 2.

   e. PORV samples will be taken monthly (following change in filtration). This is expected to provide adequate time to address the problem if unsatisfactory results are obtained.

ADDITIONAL INFORMATION:

The PORVs are manufactured by Control Component, Inc., with Enertech (formerly Paul-Munroe Hydraulics, Inc.) hydraulic actuators, model number PF89270-500 series.

LER 90-011 for STPEGS Unit 2 addressed a reactor shutdown due to an inoperable steam generator power-operated relief valve. Steam generator 2D PORV became inoperable due to chemical breakdown of the hydraulic fluid in the actuator assembly. The chemical breakdown was caused by a valve bonnet steam leak which resulted in elevated temperature in the valve actuator area and which contributed to moisture intrusion into the hydraulic reservoir.

LER 88-039 for STPEGS Unit 1 addressed an event in which Technical Specification 3.0 3 was entered due to a Maintenance Electrician inadvertently hitting a local trip button with his elbow. This caused loss of power to MCC E1B2 and various Train B components.

LER 89-006 for STPEGS Unit 1 addressed a partial loss of offsite power caused by inadvertent actuation of a generator breaker test switch by an unlicensed operator.

LER 87-013 for STPEGS Unit 1 addressed an event in which a construction engineer inadvertently turned off a disconnect switch providing power to the toxic gas monitors which was located adjacent to one being installed. A corrective action for this event was establishment of a plant operability task force which was to consider use of protective guards or special caution tags to help prevent accidental switch operation.