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

June 25, 1991
ST-HL-AE-3803
File No.: G26
10CFR50.73

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

South Texas Project Electric Generating Station
Unit 1
Docket No. STN 50-498
Licensee Event Report 91-017 Regarding
Control Room Ventilation Actuation to Recirculation
Mode Due to a Spurious Signal from a Toxic Gas Analyzer

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 91-017) regarding a control room ventilation actuation to the recirculation mode due to a spurious signal from a toxic gas analyzer. The safety systems performed as designed and the event did not have any 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 myself at (512) 972-7205.

for William J. Jump
Manager,
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KT/sg:

Attachment: LER 91-017 (South Texas, Unit 1)

IE22
1/1

cc:

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Revised 01/29/91

L4/NRC/

NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
South Texas, Unit 1	0 5 0 0 0 4 9 8	1 OF 0 4

TITLE (4) Control Room Ventilation Actuation of Recirculation Mode Due to a Spurious Signal from a Toxic Gas Analyzer

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 6	9 1	9 1	—	0 1 7	—	0 0	0 6	2 5	9 1		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
	1	20.402(b)	20.405(c)	X	50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)	1 0 0	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	

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 26, 1991, Unit 1 was in Mode 1 at 100 percent power. At 1534 hours, the control room ventilation system actuated to the recirculation mode as a result of a spurious trip from a toxic gas analyzer. The exact cause of the event could not be determined but has been attributed to poor electrical connection on one or more plug-in integrated circuit chips in the analyzer. Corrective actions include troubleshooting of the failed analyzer, further design improvements to minimize false actuation signals, and development of preventive maintenance tasks to periodically reseat integrated circuit chips in the toxic gas analyzers.

LER\91161002.U1

DESCRIPTION OF EVENT:

On May 26, 1991, Unit 1 was in Mode 1 at 100 percent power. At 1534 hours, an automatic actuation of the control room ventilation to recirculation mode occurred as a result of a spurious signal from one of two toxic gas analyzers (XE-9326). Control room ventilation actuation to recirculation mode is an Engineered Safety Feature (ESF). An investigation was initiated and the recirculation mode damper lineup was verified. The NRC was notified of the unanticipated ESF actuation at 1704 hours on May 26, 1991.

There were no personnel working on or around the toxic gas analyzers when the actuation occurred. The Emergency Response Facility Data Acquisition and Display System (ERFDADS) computer display showed an extremely high concentration of vinyl acetate (on the order of 10^{34} ppm) which is indicative of an electronic failure. Approximately seven minutes after the actuation occurred, the analyzer stopped communicating with ERFDADS which is also indicative of an electronic failure.

The toxic gas analyzers consist of a microprocessor-based spectrographic analyzer cell which communicates electronically with a maintenance terminal (or ERFDADS) and an interface circuit board which operates peripheral devices such as sample solenoid valves and output relays. A manufacturer representative arrived on site May 29, 1991 to assist with cause determination and to rework the analyzer. The exact cause could not be determined, but based upon field experience, the manufacturer representative concluded that the erratic operation was caused by poor electrical connection on one or more plug-in integrated circuit (IC) chips. The IC chips were reseated to restore any degraded connections in the four analyzers at the South Texas plant (two in each unit). No failures or erratic operation have since been observed.

CAUSE OF EVENT:

The ESF actuation was caused by a spurious signal from a single toxic gas analyzer. The exact cause of the spurious signal could not be conclusively determined but has been attributed to poor electrical connection on one or more plug-in integrated circuit chips.

ANALYSIS OF EVENT:

Unplanned actuation of an Engineered Safety Feature is reportable pursuant to 10CFR50.73(a)(2)(iv). There were no adverse radiological or safety consequences as a result of the event. The control room ventilation system

ANALYSIS OF EVENT: (cont'd)

actuated to the recirculation mode as required. No toxic gas was determined to be present, and the event did not affect the normal operation of the unit.

While any unnecessary challenge to an Engineered Safety Featu e is undesirable, actuation of the control room ventilation system to recirculation mode represents a minimal hazard since it could not cause, worsen, nor prevent mitigation of an accident.

CORRECTIVE ACTIONS:

The following corrective actions are being taken as a result of this event and two previous events which occurred in Unit 2 on May 16 and 21, 1991, reported as LER 91-006:

1. Analyzer XE-9236 was reworked and returned to service on May 30, 1991.

2. Management has approved modifications for both units which will replace and upgrade the Toxic Gas Monitoring System with State of the Art equipment. These modifications will enhance system reliability and minimize spurious ESF actuations caused by monitor anomalies. The implementation of the proposed design changes is being pursued as a high priority activity at STPEGS. Implementation of a portion of these design changes is predicated upon NRC approval of a Technical Specification change request which HL&P proposes to submit in August, 1991.

3. The integrated circuit chips have been reseated to restore any degraded connections in the four analyzers in both units.

4. Maintenance will develop preventive maintenance tasks to periodically reseat IC chips in the toxic gas analyzers. These PMs will be approved by July 30, 1991.

ADDITIONAL INFORMATION:

On October 26, 1990, a similar event, reported as LER 90-015, occurred in Unit 2 as a result of a spurious actuation from analyzer XE-9325. The cause of that event could not be conclusively determined but was attributed to failure of the analyzer's microprocessor interface circuit board. The circuit board was reworked and returned to service as a result of the event.

ADDITIONAL INFORMATION: (cont'd)

On May 16 and 21, 1991, two similar events, reported as LER 91-006, occurred in Unit 2 as a result of the spurious actuations from analyzer XE-9325. The cause of those events could not be conclusively determined but was attributed to poor electrical connection on one or more plug-in integrated circuit chips. The IC chips were reseated to restore any degraded connections in the four analyzers as a result of the events.

Several other events involving the toxic gas analyzers have been reported and corrective actions have been implemented to improve the reliability of the Foxboro Miran 981 Analyzers.

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