

The Light company

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

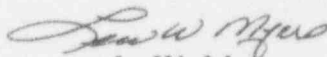
October 24, 1994
ST-HL-AE-4913
File No.: G26
10CFR50.73

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

South Texas Project
Unit 1
Docket No. STN 50-498
Licensee Event Report 94-016
Failure to Fully Meet the Requirements of Technical Specifications
Due to Not Placing the Control Room Envelope Heating,
Ventilation and Air Conditioning System in the Required Mode

Pursuant to 10CFR50.73, Houston Lighting & Power submits the attached Unit 1 Licensee Event Report 94-016 regarding a failure to fully meet the requirements of Technical Specifications due to not placing the Control Room Envelope Heating, Ventilation and Air Conditioning system in the required mode. This event did not have an adverse effect on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. J. M. Pinzon at (512) 972-8027 or me at (512) 972-8664.


L. W. Myers
Plant Manager,
Unit 1

JMP/pas

Attachment: LER 94-016 (South Texas, Unit 1)

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A Subsidiary of Houston Industries Incorporated

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Houston Lighting & Power Company
South Texas Project Electric Generating Station

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNEB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

South Texas Unit 1

DOCKET NUMBER (2)

05000 498

PAGE (3)

1 OF 5

TITLE (4)

Failure to Fully Meet the Requirements of Technical Specifications due to Not Placing the Control Room Envelope Heating, Ventilation and Air Conditioning System in the Required Mode

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 NAME	DOCKET NUMBER
09	23	94	94	-- 016 --	00	10	24	94	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)						
POWER LEVEL (10)	98	20.402(b)		20.405(c)		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
		20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
		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

Jairo Pinzon - Staff Engineer

TELEPHONE NUMBER (Include Area Code)

(512) 972-8027

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)

YES (If yes, complete EXPECTED SUBMISSION DATE).

X NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On September 23, 1994, Unit 1 was in Mode 1 at 98% power. At 1125 hours, it was discovered that Toxic Gas Analyzer XE-9326 was operating with its multiplier voltage switched off (computer controlled switch), rendering it incapable of detecting toxic gas concentrations as required by Technical Specification 3.3.3.7. Upon review of archival information, it was determined that Toxic Gas Analyzer XE-9326 had been inoperable since 1450 hours on September 22, 1994. Similarly, on September 28, 1994, at 0957 hours, while troubleshooting Toxic Gas Analyzer XE-9326, it was discovered that Toxic Gas Analyzer XE-9327 was also inoperable. Subsequent review of archival computer data revealed that Toxic Gas Analyzer XE-9327 had become incapable of detecting toxic gas concentration at approximately 0300 hours. In these instances, the requirements of Technical Specification 3.3.3.7 were not met since the Control Room Envelope Heating, Ventilation and Air Conditioning system was not placed in toxic gas recirculation within one hour. The root cause of these events is an inadequate design of the toxic gas analyzers which did not support annunciating specific failure mechanisms. Corrective actions include troubleshooting and repairing the toxic gas analyzers, and implementing a modification to provide an alarm function in the Control Room for failures of toxic gas analyzers due to the indication dropping below the lower limits of the analyzers.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATIONESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS
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FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE
INFORMATION AND RECORDS MANAGEMENT BRANCH (MNRB
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WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK
REDUCTION PROJECT (3150-0104), OFFICE OF
MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
South Texas, Unit 1	05000 498	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		94	-- 016 --	00	

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

DESCRIPTION OF EVENT:

On September 23, 1994, Unit 1 was in Mode 1 at 98% power. At 1125 hours, Instrumentation and Control Technicians discovered that Toxic Gas Analyzer XE-9326 was operating with its multiplier voltage switched off (computer controlled switch), rendering it incapable of detecting toxic gas concentrations as required by Technical Specification 3.3.3.7. Since Toxic Gas Analyzer XE-9327 was already out of service due to corrective maintenance activities, the Control Room Envelope Heating, Ventilation, and Air Conditioning system was manually placed in the Toxic Gas Recirculation mode to comply with Technical Specification requirement with two analyzers inoperable. The multiplier voltage on Toxic Gas Analyzer XE-9326 was reenergized and returned to normal operation. Upon review of archival information, it was determined that Toxic Gas Analyzer XE-9326 had been inoperable since 1450 hours on September 22, 1994, when a spurious event had caused the two remaining operable analyzers to become incapable of detecting toxic gas concentration. As a result, the requirements of Technical Specification 3.3.3.7 had not been met in that the Control Room Envelope Heating, Ventilation and Air Conditioning system was not placed in toxic gas recirculation within one hour.

Review of computer data revealed that Toxic Gas Analyzer XE-9325 returned to normal operation at 2220 hours on September 22, 1994, after it performed an automatic zero sequence which raised the parameters to the present background. Toxic Gas Analyzer XE-9326 remained inoperable because the multiplier voltage, which is computer software controlled, was switched off. Since there is no alarm function associated with low limit indication, the failure was not discovered for approximately 19 hours.

The investigation centered around attempting to identify the spurious event that affected all three analyzers.

1. Fluctuations or loss of Alternating Current power was not likely because each analyzers is powered by a different Uninterruptible Power Source. Data from one of these sources was reviewed but revealed no irregularities.
2. Computer alarm logs and the Control Room logs were reviewed but there was no indication of any event that could have affected the analyzers.
3. Experiments with a toxic gas analyzer which is used for training, were conducted to attempt to duplicate the event. Experiments included operating a hand held radio near the analyzer and removing and reapplying the power to the keyboard terminal that is used to communicate with the analyzer. These experiments were performed several times but the analyzer remained fully functional.
4. Queries were made as to the possible release of some chemical during this time period that could have affected the analyzers. There was no known release of chemicals. In addition, the three analyzers in Unit 2 did not register any transients and as such this possible cause was ruled out.

LICENSEE EVENT REPORT (LER)
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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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South Texas, Unit 1	05000 498	94	-- 016 --	00	3 OF 5

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

DESCRIPTION OF EVENT: (Continued)

Data from the analyzers was transmitted to the manufacturer, Extrel, for evaluation. Extrel concluded that some electrical transient had occurred that affected all three analyzers, such that the computer programs for Toxic Gas Analyzers XE-9325 and XE-9326 had been interrupted affecting the setup parameters. Toxic Gas Analyzer XE-9325 returned to normal operation after it performed an automatic zero sequence which reset the parameters to the present background. This is a computer controlled function which is automatically performed every eight hours on each analyzer. Toxic Gas Analyzer XE-9326 did not return to normal because the multiplier voltage had been switched off by the computer.

Subsequently, on September 28, 1994, a similar event occurred with the toxic gas analyzers. At 0957 hours, with Unit 1 in Mode 1 at 100% power, during troubleshooting Toxic Gas Analyzer XE-9326 it was noted that Toxic Gas Analyzer XE-9327 was not operating properly. The Control Room was notified and the Control Room Envelope Heating, Ventilation and Air Conditioning system was placed in the toxic gas recirculation mode since Toxic Gas Analyzer XE-9326 was already out of service.

Review of archival computer data, revealed that Toxic Gas Analyzer XE-9327 Vinyl Acetate channel had dropped below its low limit indication (-3 ppm) at approximately 0300 hours on September 28, 1994, rendering this analyzer incapable of monitoring the required concentrations of gases. In this instance, the requirements of Technical Specification 3.3.3.7 were not met since the Control Room Envelope Heating, Ventilation and Air Conditioning system was not placed in the toxic gas recirculation mode within one hour. Investigation revealed that the electron multiplier had degraded to the extent that the analyzer could no longer adequately measure toxic gas concentration as required by Technical Specifications. The electron multiplier is an amplifying device used in mass-spectrometry.

During the recovery process, a weakness in the scope of Maintenance personnel was discovered which slowed the process of returning the toxic gas analyzers to an operable status.

CAUSE OF EVENT:

The root cause of these events is an inadequate design of the toxic gas analyzers which did not support the operational needs of the plant. The design of these analyzers did not provide annunciation in the Control Room for this type of failure.

The cause of the first failure was a failure of the toxic gas analyzers when the indication dropped below the lower limit of the analyzers. The manufacturer (Extrel) was contacted to assist in the investigation of this failure. Extrel concluded that some electrical transient had occurred that affected all three analyzers. The cause of the analyzers dropping below the lower limit could not be conclusively identified, but is believed to be due to a spurious electrical transient which affected the programming of the analyzers.

Extensive troubleshooting activities were performed with the manufacturer to identify the cause of the second failure. The cause of the second failure was determined to be a failed electron multiplier.

The cause of the slow recovery process was due to a weakness in the scope of Maintenance training with regards to toxic gas analyzers.

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TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
South Texas, Unit 1	05000 498	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 5
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

ANALYSIS OF EVENT:

The failure to meet the requirements of Technical Specifications is reportable pursuant to 10CFR50.73(a)(2)(i)(B). Toxic Gas Analyzer XE-9327 was out of service for maintenance when the initiating event occurred at 1450 hours on September 22, 1994. At this time, indication on Toxic Gas Analyzer XE-9325 and XE-9326 stepped low. This condition was not discovered until 1125 hours, on September 23, 1994, at which time the Control Room Envelope Heating, Ventilation and Air Conditioning system was placed in the toxic gas recirculation mode. To comply with Technical Specification 3.3.3.7, as determined by data review, this action should have been taken prior to 1550 hours, on September 22, 1994.

In the second incident, Toxic Gas Analyzer XE-9327 was found inoperable at approximately 0957 hours, on September 28, 1994. The Control Room Heating, Ventilation and Air Condition System was immediately placed in toxic gas recirculation mode because Toxic Gas Analyzer XE-9326 was already out of service. Investigation revealed that indication for Vinyl Acetate on Toxic Gas Analyzer XE-9327 had dropped below its low limit (-3 ppm) at approximately 0300 hours on September 28, 1994. This condition rendered the toxic gas analyzer incapable of detecting toxic gas concentrations. Thus, requiring the Control Room Envelope Heating, Ventilation and Air Conditioning system to be placed in the toxic gas recirculation mode within one hour.

In both instances no toxic gases were present. These conditions did not affect the normal operation of the plant.

CORRECTIVE ACTIONS:

The following corrective actions have been taken or will be taken:

1. Upon discovery of the deficient conditions, the Control Room Envelope Heating, Ventilation and Air Conditioning system was immediately placed in the toxic gas recirculation mode to be in compliance with Technical Specification 3.3.3.7.
2. Troubleshooting activities were initiated to restore the equipment operability.
 - Results from troubleshooting activities of first event revealed that an undetected failure of the toxic gas analyzers had occurred when the indication dropped below the lower limit of the analyzers. The manufacturer (Extrel) was contacted to assist in the investigation of this failure. Extrel concluded that some electrical transient had occurred that affected all three analyzers. The cause of the analyzers dropping below the lower limit could not be conclusively identified, but was attributed to a spurious electrical transient.
 - Results from extensive troubleshooting activities with the manufacturer determined the cause of the second failure to be a failed electron multiplier.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

CORRECTIVE ACTIONS: (Continued)

3. Both toxic gas analyzers have been repaired and returned to service.
4. A design change will be installed in both Units, to provide Control Room annunciation to preclude undetected failures of the toxic gas analyzers due to the indication dropping below the lower limits of the analyzers. This action will be completed in Unit 1 by November 10, 1994, and Unit 2 by December 6, 1994.
5. To address the concern regarding maintenance training, appropriate Instrumentation & Control Technicians will be provided with training on the toxic gas analyzers. With the assistance of the manufacturer, these personnel will be provided with advanced operational and maintenance knowledge of the toxic gas analyzers. This action will be completed by November 30, 1994.
6. Monthly surveillances are performed on the toxic gas analyzers. These surveillances and periodic preventative maintenance activities adequately identify deficiencies. However, the need to periodically replace the electron multiplier as part of the preventive maintenance program will be evaluated. This action will be completed by November 30, 1994.

ADDITIONAL INFORMATION:

The toxic gas analyzers are Questor 3 Ambient Air Analyzers manufactured by Extrel Corporation.

Efforts are currently underway to improve the overall system reliability and maintainability of the toxic gas analyzers. This effort includes conducting training, performing a habitability analysis, and the development and installation of a design change to address current chemical manufacturing and chemical transportation parameters. Preliminary data from the habitability analysis indicates that system sensitivities may be decreased which will improve the reliability and maintainability of these analyzers.

Several events have been reported concerning spurious actuation of the Control Room Heating, Ventilation and Air Conditioning system caused by faults in the toxic gas analyzers but there have been no previous reported events which involved the failure to place the Control Room Envelope Heating, Ventilation and Air Conditioning system in the toxic gas recirculation mode within one hour due to an undetected failure.