

# The Light company

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

July 16, 1990  
ST-HL-AE-3501  
File No.: G26  
10CFR50.73  
10CFR50.49

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

South Texas Project Electric Generating Station  
Unit 1

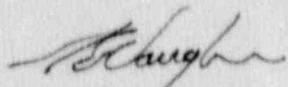
Docket No. STN 50-498

Licensee Event Report 90-012 Regarding  
The Failure to Preserve The Post-Accident  
Qualification of the Reactor Coolant System

Temperature Monitoring Instruments Due to The Absence of O-ring Seals.

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 90-012) regarding the failure to preserve the post-accident qualification of the Reactor Coolant System Temperature Monitoring Instruments pursuant to 10CFR50.49. This 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) 972-7921.

  
G. E. Vaughn  
Vice President  
Nuclear Generation

SDP/nl

Attachment: LER 90-012 (South Texas, Unit 1)

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A Subsidiary of Houston Industries Incorporated



Houston Lighting & Power Company  
South Texas Project Electric Generating Station

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cc:

Regional Administrator, Region IV  
Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, TX 76011

George Dick, Project Manager  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

J. I. Tapia  
Senior Resident Inspector  
c/o U. S. Nuclear Regulatory  
Commission  
P. O. Box 910  
Bay City, TX 77414

J. R. Newman, Esquire  
Newman & Holtzinger, P.C.  
1615 L Street, N.W.  
Washington, DC 20036

D. E. Ward/R. P. Verret  
Central Power & Light Company  
P. O. Box 2121  
Corpus Christi, TX 78403

J. C. Lanier  
Director of Generation  
City of Austin Electric Utility  
721 Barton Springs Road  
Austin, TX 78704

R. J. Costello/M. T. Hardt  
City Public Service Board  
P. O. Box 1771  
San Antonio, TX 78296

Rufus S. Scott  
Associate General Counsel  
Houston Lighting & Power Company  
P. O. Box 61867  
Houston, TX 77208

INPO  
Records Center  
1100 Circle 75 Parkway  
Atlanta, GA 30339-3064

Dr. Joseph M. Hendrie  
50 Bellport Lane  
Bellport, NY 11713

D. K. Lacker  
Bureau of Radiation Control  
Texas Department of Health  
1100 West 49th Street  
Austin, TX 78704

Revised 12/15/89

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) South Texas, Unit 1 DOCKET NUMBER (2) 050004981 OF 04 PAGE 13

TITLE (4) Failure to preserve the Post-Accident Qualification of the Reactor Coolant System Temperature Monitoring Instruments Due to the Absence of O-ring Seals.

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 (5)
06	14	90	09	01	2	00	07	16	90		050004981

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)									
3	0.00	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)						
		20.405(a)(1)(i)	50.36(a)(1)	50.73(a)(2)(v)	73.71(c)						
		20.405(a)(1)(ii)	50.36(a)(2)	X 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 306A)						
		20.405(a)(1)(iii)	X 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)(ix)							

## LICENSEE CONTACT FOR THIS LER (12)

NAME Charles Ayala - Supervising Licensing Engineer TELEPHONE NUMBER 512 977 2181

## COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

## 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 fifteen single-space typewritten lines) (16)

On June 9, 1990, Unit 1 was shutdown in Mode 3 near completion of a refueling outage. At 1100, during replacement of Loop C narrow range Reactor Coolant System (RCS) hot leg resistance temperature detector (RTD) B1RC-TE-0430Z, the I&C technicians discovered a missing O-ring seal in the associated Conax T-8 junction box. The RTD assembly is environmentally qualified for harsh environment applications. This qualification is based, in part, on the O-ring within the Conax T-8 junction box. Further inspection revealed a total of 22 missing O-rings in the 42 Unit 1 RTD junction boxes. Unit 2 was shutdown and also inspected. Six O-rings were found missing.

The missing O-ring seals have been installed. The root cause of this event has been determined to be less than adequate documentation of environmental qualification requirements for the complete RTD/Conax junction box assembly for personnel installing and maintaining the devices. An overall review of the processes for determining, describing and documenting EQ requirements is underway.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)  South Texas, Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 4 9 8 9 0	LER NUMBER (6)			PAGE (3)  2 OF 4
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
			0 1 2	0 0	

TEXT (If more space is required, use additional NRC Form 305A's) (17)

DESCRIPTION OF EVENT:

On June 9, 1990, Unit 1 was shutdown in Mode 3 near completion of a refueling outage. Loop C narrow range Reactor Coolant System (RCS) hot leg resistance temperature detector (RTD) B1RC-TE-0430Z was being replaced. At 1100, the absence of an O-ring seal in the associated Conax T-8 junction box was discovered. This condition represents a deviation from the qualified configuration identified in the environmental qualification (EQ) documentation. The Conax T-8 junction boxes serve as a termination point between the RTD cable and the Conax Electrical Conductor Seal Assembly (ECSA), which is used as a seal between the unsealed plant raceway and the RTD cable assembly. A sealed enclosure is required to preserve the qualification of the RTDs to function in a harsh environment.

Following discovery of the missing O-ring, the remaining 41 RTDs in Unit 1 having ECSAs and Conax T-8 junction boxes were inspected. A total of twenty-two T-8 junction box O-rings were determined to be missing. This included ten of sixteen narrow range RTDs, four of eight wide range RTDs, six of twelve Excess Cooldown RTDs, and two of three Component Cooling Water RTDs. Unit 2 was shut down for inspection of its RTD Conax T-8 junction boxes. A total of six O-rings were found to be missing. This included one narrow range RTD, one wide range RTD, and four Excess Cooldown RTDs.

CAUSE OF EVENT:

A thorough review of the RTD/Conax design installation and maintenance documentation was performed. The root cause of this event has been determined to be less than adequate documentation of the EQ requirements for the complete RTD/Conax assembly for personnel installing and maintaining the devices.

ANALYSIS OF EVENT:

The RCS narrow range RTDs are used for the overtemperature delta T (OTDT) and overpower delta T (OPDT) reactor trip functions. The wide range RTDs are used for the Post-Accident Monitoring System (PAMS) and indication for Remote Shutdown. The excess Cooldown RTDs provide supplementary operator information and are not relied on for accident mitigation, nor are they governed by Technical Specifications. The Component Cooling Water RTDs are R.G. 1.97 Category 2 instruments for providing post-accident information, and are not governed by Technical Specifications.

During a postulated High Energy Line Break Accident (HELBA), if the junction box is unsealed by lack of the proper O-ring, moisture may enter a RTD cable assembly and/or short-out terminals and result in failure of the RTD to accurately sense temperatures.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 6/31/86

FACILITY NAME (1)  South Texas, Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 4 9 8	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 0	— 0 1 2	— 0 0	0 3	OF	0 4

TEXT (If more space is required, use additional NRC Form 305A's) (17)

ANALYSIS OF EVENT Cont'd.:RCS Narrow Range Temperature Instrumentation:

Review of transient analysis data available from Westinghouse indicates that for the steam line breaks of concern, the OPDT trip occurs within approximately 14 seconds when rod control is in manual. Manual rod control is the normal operating mode of the plant. Containment pressure reaches less than 8 psig in that period. HL&P has concluded that because of this low pressure, the short period of time in which the reactor trip signal is generated, and the construction of the RTD/Conax assembly, moisture intrusion would not degrade performance of the narrow range RTDs before the reactor trip occurred, even with the O-rings gone. All of the narrow range RTDs were therefore considered able to perform their intended function with the O-ring missing from the junction box.

Post Accident Monitoring Instrumentation (RCS Wide Range and Component Cooling Water RTDs):

For Unit 1, three of the four RCS wide range cold leg temperature channels and one of the four RCS wide range hot leg temperature channels were found to be missing O-rings in their Conax T-8 junction boxes. For Unit 2, only one of the four RCS wide range cold leg temperature channels was found to be missing an O-ring, which was restored within the limits allowed by the Technical Specifications.

The Component Cooling Water RTDs are PAM instruments, but are not required for a safety function and are not covered by Technical Specifications.

Without the proper seal, if exposed to a steam environment, moisture intrusion would likely occur over time and degrade accuracy of the temperature measurements. The magnitude of the error introduced at any point in time cannot be readily quantified. Therefore, the long term post-accident operability of the wide range RTDs cannot be assured without the O-ring seal. This incident is therefore deemed reportable for Unit 1 pursuant to 10CFR50.73(a)(2)(vii).

CORRECTIVE ACTION:

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

1. The RTDs requiring ECSAs on both Units have been inspected for the presence of O-rings on the Conax T-8 junction boxes, and each of the O-rings has been replaced as required by the Special Equipment Qualification Maintenance Book (SEQMB).

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
South Texas, Unit 1	05000498	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (If more space is required, use additional NRC Form 365A's) (17)

CORRECTIVE ACTION Cont'd.:

2. As an interim measure a Training Bulletin on this event was issued to maintenance personnel who install and maintain EQ-related equipment. The Bulletin stressed that in the event EQ requirements cannot be derived from the SEQMB or are not explicit (e.g., where an auxiliary piece of equipment is associated with an EQ component) they are to contact engineering for clarification or an engineering evaluation.
3. A review is being performed of the EQ program which will look at the following elements: how EQ requirements are translated into the configuration control process, how EQ requirements are implemented, EQ-related training and control of EQ-related data bases. Based upon the information obtained from the review, HL&P will select a representative sample of equipment to verify that EQ requirements have been effectively implemented through the Maintenance Work Request Program. The sample will include the accessories of components associated with equipment identified as being required to operate in a harsh environment. In cases where the documentation is unclear, a field verification will be performed. This review, including the field verifications, is scheduled to be completed by September 30, 1990 subject to equipment access restraints dictated by plant conditions.

ADDITIONAL INFORMATION:

There has been no other reportable event due to less than adequate documentation of EQ requirements.

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