

# The Light company

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

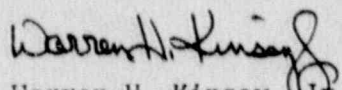
August 16, 1990  
ST-HL-AE-3539  
File No.: G26  
10CFR50.73

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 90-020 Regarding  
A reactor Trip Caused by Both Logic Trains  
of Solid State Protection System  
Being in the Urgent Alarm Condition

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 90-020) regarding a reactor trip caused by both logic trains of the Solid State Protection System being in the Urgent Alarm condition. This event had no adverse impact on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. S. M. Head at (512) 972-7136 or myself at (512) 972-7921.

  
Warren H. Kinsey, Jr.  
Vice President  
Nuclear Generation

SMH/nl

Attachment: LER 90-020 (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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Revised 12/15/89

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) South Texas, Unit 1	DOCKET NUMBER (2) 050000498	PAGE (3) 1 OF 4
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TITLE (4) Reactor Trip Caused by Both Logic Trains of the Solid State Protection System Being In the Urgent Alarm Condition

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)
07	16	90	90	0020	0000	08	16	90			050000
											050000

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) 100	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(e)						
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 306A)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(k)								

LICENSER CONTACT FOR THIS LER (12)

NAME Scott Head - Supervising Licensing Engineer	TELEPHONE NUMBER 512 972-7136
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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	J E	A S	G 2 2 3	Yes					

SUPPLEMENTAL REPORT EXPECTED (14)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

At 0236, on July 16, 1990 with Unit 1 at 100% power, a reactor trip occurred during performance of a Solid State Protection System (SSPS) surveillance test. The trip was caused by a malfunction in a test switch which resulted in one train of SSPS remaining in the Urgent Alarm condition, coupled with completion of a subsequent procedural step that placed the other SSPS train in the Urgent Alarm condition. The SSPS is designed such that if both logic trains are placed in the Urgent Alarm condition, a reactor trip occurs. The test switch will be replaced prior to startup from the next refueling outage. In addition, test procedures have been revised to ensure that Urgent Alarm conditions are satisfactorily cleared prior to continuing with procedural steps that could result in a reactor trip.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

TEXT (If more space is required, use additional NRC Form 306A's) (17)

DESCRIPTION OF EVENT:

At 0236, on July 16, 1990 with Unit 1 in Mode 1 at 100 percent power, a reactor trip occurred during the performance of a Solid State Protection System (SSPS) surveillance test. A turbine trip was initiated by the reactor trip and feedwater isolation occurred on low Reactor Coolant System (RCS) average temperature. Auxiliary feedwater (AFW) actuated on a low-low steam generator level signal. No other Engineered Safety Feature (ESF) actuations occurred during this event. The Main Steam Isolation Valves were manually closed to minimize the cooldown and the Steam Dump Valves and Steam Generator Power Operated Relief Valves operated as expected. Control room personnel responded in accordance with the Emergency Operating Procedures and stabilized the plant. The NRC was notified at 0500 hours.

The SSPS consists of logic trains R and S. Placing either logic train in a test configuration results in an Urgent Alarm. Placing both trains in test simultaneously, i.e., both trains in the Urgent Alarm condition, results in a reactor trip. Prior to the event, a Train S reactor trip breaker Trip Actuating Device Operational Test (TADOT) was being performed. The procedure requires placing Train S test switch A in the test position which results in an Urgent Alarm. Subsequent steps require placing the switch in the "off" position which clears the Urgent Alarm. Investigation confirmed that Test Switch A was placed in the "off" position as required. However, the contacts apparently did not make and the Urgent Alarm remained energized. In a subsequent procedure step, a Multiplexer Test Switch in the Train R cabinet is required to be moved from the "Normal" to the "R+S" position by passing through the "Inhibit" position. This manipulation momentarily enables the Train R Urgent Alarm. Since an Urgent Alarm condition still existed from Train S, a reactor trip was generated.

Subsequent to the trip, it was found that with additional manipulation of test switch A, the Train S Urgent Alarm could be deenergized. During a repeat performance of the surveillance test, the conditions that allowed the Train S Urgent Alarm to remain enabled could not be recreated.

Similar malfunctions have previously occurred with two identical SSPS test switches while performing logic tests, however, no plant transients occurred since the problems were identified by the operators. One test switch was replaced during the last Unit 1 refueling outage and sent to the vendor for analysis. The vendor indicated that the switch showed signs of wear. The second switch, located in the Unit 2 SSPS, is scheduled to be replaced in the upcoming refueling outage.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

DESCRIPTION OF EVENT - Continued:

The test procedure did not include a verification step to ensure the Urgent Alarm is cleared prior to engaging the Train R test circuit. A verification step would have enabled test personnel to take remedial action prior to proceeding to the next step in the procedure.

CAUSE OF EVENT:

The reactor trip was caused when both the R and S logic trains of SSPS were in the Urgent Alarm condition at the same time. The situation was caused by a malfunction in a test switch which resulted in one train of SSPS remaining in the Urgent Alarm condition, coupled with completion of a subsequent procedural step that placed the other SSPS train in the Urgent Alarm condition. A contributing factor was that the test procedure did not require verification to ensure that Urgent Alarms would not be engaged for both logic trains simultaneously.

ANALYSIS OF EVENT:

Unplanned reactor protection system actuation is reportable pursuant to 10CFR50.73(a)(2)(iv). The reactor tripped as required and plant equipment operated as expected. The test switch malfunction was cleared and the SSPS was returned to service. At no time could this particular test switch create conditions wherein the SSPS could not fulfill its safety function. There were no adverse radiological or safety consequences as a result of this event.

CORRECTIVE ACTION:

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

- 1) Procedures have been revised to ensure that the Urgent Alarm for one SSPS train is successfully cleared prior to initiating the Urgent Alarm condition for the other train. This will prevent any similar occurrences prior to switch replacement.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

CORRECTIVE ACTION - Continued:

- 2) The test switch that previously malfunctioned on Unit 2 will be replaced during the upcoming refueling outage and will be sent offsite for analysis. Results of this analysis will be evaluated and appropriate actions implemented regarding generic implications of this switch failure.
- 3) The Unit 1 Train S logic test switch A will be replaced prior to startup from the next refueling outage.

ADDITIONAL INFORMATION:

The test switch is a 24 position rotary switch manufactured by Grayhill, model number 53M15-10-01-24N-C.

No similar events have been reported at the South Texas Project.

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