

The Light company

Houston Lighting & Power

P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

February 8, 1991
ST-HL-AE-3683
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

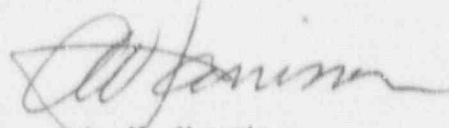
Docket No. STN 50-499

Licensee Event Report 91-001

Regarding a Manual Reactor Trip Due to Full Closure of a
Feedwater Isolation Valve During Operational Problem Investigation

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 91-001) regarding a manual reactor trip due to full closure of a feedwater isolation valve during operational problem investigation. 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. C. A. Ayala at (512) 972-8628 or myself at (512) 972-7298.



A. W. Harrison
Manager
Nuclear Licensing

RAF/sgs

Attachment: LER 91-001 (South Texas, Unit 2)

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Houston Lighting & Power Company
South Texas Project Electric Generating Station

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Revised 01/29/91

L4/NRC/

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): South Texas, Unit 2	POCKET NUMBER (2): 0 5 0 0 0 4 9 9	PAGE 3 1 OF 0 5
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TITLE (4): **Manual Reactor Trip Due to Full Closure of a Feedwater Isolation Valve During Operational Problem Investigation**

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)
01	09	91	91	001	000	20	08	91			0 5 0 0 0
0 5 0 0 0											

OPERATING MODE (8): 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.71 (Check one or more of the following) (11):									
POWER LEVEL (10): 110.0	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)					
	20.405(a)(1)(ii)	50.38(a)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(c)					
	20.405(a)(1)(iii)	50.38(a)(2)	<input type="checkbox"/>	50.73(a)(2)(vi)	OTHER (Specify in Appendix A, 10 CFR 50.71 and in Test, NRC Form 365A)					
	20.405(a)(1)(iv)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(vii)(A)						
	20.405(a)(1)(v)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(vii)(B)						
20.405(a)(1)(vi)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(viii)	50.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12):

NAME: Charles Ayala - Supervising Licensing Engineer	TELEPHONE NUMBER: 5 1 2 9 7 2 - 8 6 2 8
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13):

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPSDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPSDS

SUPPLEMENTAL REPORT EXPECTED (14):

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE): <input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15): MONTH: DAY: YEAR:
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-spaced typewritten lines) (16):

On January 9, 1991, Unit 2 was in Mode 1 at 100% power. At 2207 hours, Feedwater Isolation Valve (FWIV) 2C closed during the investigation of low nitrogen and low hydraulic pressure alarms for FWIV 2C. The resultant loss of feedwater flow caused a decrease in Steam Generator (SG) level and the reactor was manually tripped. The cause of the manual reactor trip was a failed-closed feedwater isolation valve. The feedwater isolation valve closed when an operator incorrectly removed a power supply fuse to the trip solenoid. The fuse was removed when trying to determine the cause of power loss to the FWIV hydraulic skid. This was caused by failure to coordinate operational problem investigation and the use of information without providing necessary verification; annunciator response procedures did not provide direction pertaining to a loss of power; and lack of formal training on the investigation of power supplies. Corrective actions include: training of licensed and non-licensed operators; revision of annunciator response procedures; as well as other recurrence measures.

A1/LER027U2.L01

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) South Texas, Unit 2	DOCKET NUMBER (2) 0 6 0 0 0 4 9 9 1	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (if more space is required, use additional NRC Form 3654's) (11)

DESCRIPTION OF EVENT:

On January 9, 1991, Unit 2 was in Mode 1 at 100% power. At 2207 hours, Feedwater Isolation Valve (FWIV) 2C closed due to interruption of power to one of two safety grade solenoid dump valves during operational troubleshooting. Steam Generator (SG) 2C level started to decrease and the reactor was manually tripped since an automatic reactor trip was imminent due to low steam generator water level. The turbine tripped, Auxiliary Feedwater (AFW) flow initiated on low-low steam generator level and Feedwater Isolation occurred on low Reactor Coolant System average temperature. All systems responded as expected except the FWIV bypass valve to SG 2C opened to approximately 30% following the Feedwater Isolation signal. At 2243 hours, the plant was stabilized in Mode 3. The NRC was notified at 0008 hours on January 10, 1991.

At 2145 hours, on January 9, 1991, the low hydraulic and low nitrogen pressure alarms for FWIV 2C annunciated. A non-licensed operator was dispatched by the control room to investigate the condition locally. The non-licensed operator reported that the FWIV 2C pneumatic and electric hydraulic pumps were not operating.

The feedwater isolation valve is held open against nitrogen pressure by hydraulic pressure maintained by the pneumatic and electric hydraulic pumps. The low nitrogen and hydraulic pressure conditions for FWIV 2C indicated movement of the FWIV and impending closure although the amount of time involved before full closure of the FWIV was not known. Operations personnel were sensitized to a history of problems with the feedwater isolation valves which have resulted in sudden closure and subsequent plant trips and therefore took immediate actions to locate the cause of the failure. The operators believed that immediate actions were necessary to prevent a plant trip.

The Unit Supervisor joined the non-licensed operator at the FWIV 2C hydraulic skid unit and determined that a solenoid valve in the air supply line for the FWIV 2C pneumatic and hydraulic pumps was not operating due to a loss of electrical power to the hydraulic skid. The Unit Supervisor advised the control room to check power supplies for the hydraulic skid unit. The shift supervisor directed operators in the control room, one of which was a Reactor Operator (RO) trainee, to assist in determining the applicable power supplies. Several sources of information were needed and used, such as diagrams and operating procedures, to establish a list of potential power supplies. The RO trainee identified the power supply to the hydraulic pumps and incorrectly identified the Class 1E power supply to one of the two safety grade solenoid dump valves for FWIV 2C as possible power supplies to check. The list was given to a second non-licensed operator. At approximately 2200 hours, the shift supervisor directed the second non-licensed operator to check the various power supplies identified on the list including breakers, fuses, and

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

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

DESCRIPTION OF EVENT: (cont'd)

continuity. The shift supervisor did not recognize that the list had not been verified by one of the licensed operators. At approximately 2206 hours, the Unit Supervisor locally directed a non-licensed operator to check the fuse on the hydraulic skid unit. The fuse was checked with no problem found. In the process of replacing the fuse the circuit was completed. Subsequently, the hydraulic pumps started and the low pressure alarms cleared in the control room. Communications were established between the Control Room and the Unit Supervisor to report the results of the pumps starting and alarms clearing. At 2207 hours, the control room was unsuccessful in attempting to contact the second non-licensed operator by radio who was in the process of checking power supplies in the switchgear room. At approximately 2207 hours, the non-licensed operator pulled the fuse to the class 1E power supply, which deenergized one of the two safety grade solenoid dump valves. FWIV 2C began closing and a manual reactor trip was initiated as feedwater flow to SG 2C approached zero. Other than the FWIV bypass valve failure to fully close, there were no other unexpected post trip transients.

CAUSE OF EVENT:

The direct cause of the manual reactor trip was a failed-closed feedwater isolation valve.

The causes of the failed-closed feedwater isolation valve are:

1. The shift supervisor failed to coordinate the operational problem investigation of the skid unit and used a Reactor Operator trainee without providing the necessary verification. Such verification could have corrected the list of power supplies to be checked.
2. The annunciator response procedures for the low pressure alarms were less than adequate in that they did not provide direction pertaining to a loss of power.
3. There is no formal training given to licensed or non-licensed operators on problem investigation of power supplies.
4. The power supply label on the hydraulic skid unit was not correct. Had the correct power supply been indicated there would have been no need to perform reviews to identify which power supply was involved.

The FWIV Bypass Valve failed to close due to the positioner being out of calibration. The valve positioner was re-calibrated.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT IF more space is required, use additional NRC Form 3604's (17)

ANALYSIS OF EVENT:

An unplanned reactor trip is reportable pursuant to 10CFR50.73(A)(2)(iv). The plant was stabilized in Mode 3 following this event. This event did not result in any adverse safety or radiological concerns nor did it threaten the safety of the public at any time.

CORRECTIVE ACTIONS:

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

1. It was determined that loss of power to the hydraulic skid was the result of the fuse block on the hydraulic skid losing continuity because the screws holding the block and lugs were loose. The screws were tightened. The remaining fuse blocks on the Unit 2 skids were checked with no problems found. The fuse blocks in the Unit 1 skids will be checked prior to startup from the current refueling outage.
2. Night Orders have been issued to Operations personnel following this event on the importance of attention to detail and performing proper reviews.
3. The power supply label on the hydraulic unit was corrected and the remaining units were verified to be correct.
4. The appropriate annunciator response procedures will be revised to incorporate direction pertaining to a loss of power. This action will be completed by March 1, 1991.
5. Additional training on the limitations of a trainee will be included in initial licensed operator training. This will ensure that trainees do not participate in critical operational activities without the appropriate supervisory oversight. This action will be completed by April 12, 1991.
6. This event will be covered during licensed operator requalification. Training will emphasize the importance of coordinating and sequencing problem investigations, independent verification during identification of components and plant operations policy regarding the use of trainees. This action will be completed by May 25, 1991.
7. Operational problem investigation of power supplies will be incorporated into the licensed and non-licensed operator training programs. Revision to the lesson plans and appropriate training will be completed by November 15, 1991.

HL&P has previously identified the need to separate the power supply for the pneumatic and electric hydraulic pumps. The design has been developed and is scheduled to be implemented during the current refueling outage for Unit 1 and the next refueling outage for Unit 2.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

ADDITIONAL INFORMATION:

There have been two previous events, LER 90-006 and LER 90-023 for Unit 1, concerning a reactor trip due to inadvertent closure of a feedwater isolation valve.

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