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

May 29, 1990
ST-HL-AE-3473
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 90-007 Regarding the Potential for
Flooding of the Standby Diesel Generator 22 Room

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P) submits the attached Licensee Event Report (LER 90-007) regarding the potential for flooding of the standby diesel generator 22 room. 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

BEM/nl

Attachment: LER 90-007 (South Texas, Unit 2)

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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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

TITLE (4)
Potential For Flooding of Standby Diesel Generator 22 Room

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 4	2 6	9 0	9 0	0 0 7	0 0	0 5	2 9	9 0		0 5 0 0 0
										0 5 0 0 0

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)	1 0 0	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 (Specify in Abstract below and in Text, NRC Form 366A)
		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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Charles Ayala - Supervising Licensing Engineer	AREA CODE 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 April 26, 1990, Unit 2 was in Mode 1 at 100 percent power. At approximately 1556 hours, the Standby Diesel Generator (SDG) 22 room high sump level alarm actuated in the control room. An operator dispatched to respond to the alarm observed approximately five inches of water accumulation on the floor in the north end of the room. Additional water was observed leaking through the removable panels located on the north exterior wall from a severe rainstorm which was in progress at the time. Corrective action was taken to caulk the gasket area around the removable panels. The cause of this event was that procedural controls were not in place to ensure that the removable panels were reinstalled in accordance with design requirements. A contributing factor was inadequate specification of sealing and testing requirements. Procedural controls and improved design requirements are currently being developed to ensure proper reinstallation of the removable panels.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
South Texas, Unit 2	0 5 0 0 0 4 9 9	9 0	— 0 0 7	— 0 0	0 2 OF 0 4

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

DESCRIPTION OF EVENT:

On April 26, 1990, Unit 2 was in Mode 1 at 100 percent power. At approximately 1556 hours, the Standby Diesel Generator (SDG) 22 room high sump level alarm actuated in the control room. An operator dispatched to respond to the alarm observed approximately five inches of water accumulation on the floor in the north end of the room. Additional water was observed leaking through the removable panels located on the north exterior wall from a severe rainstorm which was in progress at the time. Minimal leakage was observed into other diesel generator rooms. SDG 22 was declared inoperable at 1858 hours. Corrective action was taken to caulk the gasket area around the removable panels and SDG 22 was declared operable at 1630 hours on April 28, 1990.

Each Standby Diesel Generator room has a set of four interlocking removable panels on the North wall which can be removed to provide access for maintenance of the respective SDG. The panels are gasketed and bolted to the diesel generator building to form a watertight seal which is designed to prevent excessive inleakage of water during a design basis rainstorm or flood. As a result of a failure of SDG 22 on November 28, 1989, the panels were removed for access. However, during reinstallation, the gasket area was not caulked in accordance with design drawings. Subsequent post maintenance testing consisted of spraying the gasket with a fire hose which did not adequately test the integrity of the seal for a static head of water due to flooding.

During the rainstorm and in testing following initial repairs to the SDG 22 panel seal, some leakage was observed into the other SDG rooms. However, this leakage was much less significant and several hours would have been available during flood conditions to take compensatory action.

Following the discovery of the seal leaks, action was immediately taken to place silicone sealant over the panel gaskets for all SDG rooms. A partial height flood test was performed to verify the adequacy of the seals since a full height test was not feasible. The measured inleakage, when extrapolated to the flood height due to probable maximum precipitation (as predicted in the Updated Final Safety Analysis Report) was small enough to not pose a threat to the operation of the SDGs. These measurements were then extrapolated to account for flood elevations predicted in the UFSAR due to an upstream dam break on the Colorado river. It was determined that the expected inleakage would require 19 hours from the onset of flooding to cause significant room flooding and a flood of this type would be preceded by a warning of approximately 65 hours before it reached the plant site. Therefore, sufficient time is available to take reasonable compensatory actions.

As a result of this event, other external openings were inspected for deficiencies which could cause internal flooding of safety-related structures. An opening was found on the east wall of the Unit 1 Mechanical Electrical Auxiliary Building (MEAB) which had removable panels installed; however, they were not sealed in accordance with design drawings. These panels have not been removed since receipt of the operating license. Sealing of the panels as required by the design has been performed. Calculations of expected inleakage in the as found condition resulting from design basis flooding showed that a minimum of nine hours would have been available for compensatory action.

CAUSE OF EVENT:

The following causes have been identified for leakage of water into the SDG 22 room:

1. Procedural controls were not in place to ensure that the diesel generator room removable panels were reinstalled in accordance with design requirements.

2. The design requirements for sealing the removable panels were not clear.

3. The testing specified to check the panel seal integrity following installation did not adequately test for leakage through the lower seal for a static head of water due to a flood.

4. The design of the seal is sensitive to installation variables.

ANALYSIS OF EVENT:

Since the rate of leakage into the SDG 22 room was observed to substantially exceed the expected rate of leakage for design basis flood conditions, HL&P has determined that failure to properly seal the removable panels in January of 1990 could have resulted in SDG 22 being rendered inoperable in a flood since that time. This condition is in violation of Technical Specification 3.8.1.1 and is reportable pursuant to 10CFR50.73(a)(2)(i)(B).

Two flooding events have been postulated which could result in excessive water leakage into the diesel generator rooms. Flooding as a result of probable maximum precipitation has been calculated to cause an average flood elevation of 29.25 feet (plant grade elevation is approximately 28 feet) over a period of 41 hours and a maximum leakage rate into each room of 1.91 gpm. At this leakage rate, with no compensatory actions and assuming failure of the sump pumps, an accumulation of less than 4 inches of water is expected on the floor of the room which will not impair SDG operation. Prior to the repair of the SDG 22 room panels, the expected inleakage was much higher which could have affected operation of SDG 22.

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Flooding as a result of an upstream dam break on the Colorado river has been calculated to cause a still water flood elevation of 32 feet. Including the effects of wind driven waves and runup, an average leakage rate into the diesel generator rooms of 6.04 gpm was calculated. At this leakage rate, with no compensatory actions and assuming failure of the sump pumps, an accumulation sufficient to impair operation of the diesel generators could occur over a period of approximately 19 hours. Flooding of this magnitude would be preceded by approximately 65 hours notice which would allow sufficient time to take compensatory actions.

Immediately following the discovery of the deficient seal on the SDG 22 removable panels, the gaskets on the other SDG room removable panels were resealed. The above calculations were performed based on leakage measurements taken following this corrective action. However, since observed in-leakage through the other SDG room removable panels during the rainstorm (prior to resealing) was minimal, sufficient time would have been available in a design basis flood to take compensatory actions.

CORRECTIVE ACTIONS:

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

1. The seals on the SDG 22 room removable panels have been caulked.

2. Detailed procedural controls are being developed to control the reinstallation and testing of removable watertight panels. This action will be completed by August 1, 1990.

3. The design requirements for sealing of the removable panels will be clarified by June 30, 1990.

4. The testing specified to verify the panel seal integrity will be revised to ensure that the current seal design is adequately tested by June 30, 1990.

5. An engineering evaluation is being performed of the diesel generator room removable panel seal design to determine if modifications can be performed to improve the effectiveness of the seals. This action will be completed by August 30, 1990. A schedule for implementation of the modifications will be prepared at that time.

ADDITIONAL INFORMATION:

There have been no previous events reported regarding potential flooding of safety-related systems due to inadequate sealing.

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