

**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 (MNBB 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 4

TITLE (4) Inoperable Tornado Damper

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
01	24	94	94	-- 003 --	01	05	06	94	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)		
POWER LEVEL (10)	0	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)		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)	X	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)		VOLUNTARY		

LICENSEE CONTACT FOR THIS LER (12)

NAME	Jairo M. Pinzon - Staff Engineer	TELEPHONE NUMBER (Include Area Code)	(512) 972-8027
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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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 24, 1994, Houston Lighting & Power determined that a condition discovered on January 18, 1994 was reportable. On January 18, 1994, at approximately 1100 hours, with Unit 1 in Mode 5, Maintenance personnel discovered an interference between the plant exhaust vent tornado damper linkage and a gusset (ductwork structural stiffener). The damper consists of four sections, each of which has linkage that interconnects the individual damper blades. The gusset limited the closing travel of the damper linkage in the upper left section to approximately 40% of full stroke, thus preventing the section from closing. The cause of the condition was an undetected construction interference which was corrected by notching the gusset to allow free travel of the damper linkage.

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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	2 OF 4
		94	-- 003 --	01	

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

DESCRIPTION OF EVENT:

On January 24, 1994, Houston Lighting & Power determined that a condition discovered on January 18, 1994 was reportable. On January 18, 1994, at approximately 1100 hours, Unit 1 was in Mode 5 with the reactor shutdown, reactor pressure at 350 psi, and reactor temperature at 147 degrees F. During the performance of service request VE-210282, Maintenance personnel discovered an interference between the plant exhaust vent tornado damper (1VDA113) linkage and a gusset (ductwork structural stiffener). The damper consists of four sections, each of which has linkage that interconnects the individual damper blades. The gusset limited the closing travel of the damper linkage in the upper left damper section to approximately 40% of full stroke, thus preventing the section from closing completely. The chronology of this condition follows.

Each damper section consists of six vertical damper blades, each fixed to its own axle. The six damper blade axles are connected by fixed linkages such that the six blades in the section operate together. Each damper section has a manual override lever arm attached with a friction-fit collar to two of the outer damper blade axles. The manual override lever arms are used to manually rotate the damper blade axles to overcome the constant force springs holding the damper blades open, in order to verify that the damper blades, axles, and linkages are free to rotate. This action is known as manually stroking the damper.

On May 29, 1993, in response to a Diagnostic Evaluation Team observation that there was no evidence of testing to show that tornado dampers would actuate as required, STP initiated changes to existing preventive maintenance work instructions for all tornado dampers (fifteen per unit) to include manual stroking on a periodic basis. The stroking of the dampers per the revised preventive maintenance work instructions was scheduled to be accomplished during the outage, based on manpower and system availability. One tornado damper was successfully stroked in June 1993, followed by eight more during August 1993.

On October 21, 1993, during the first performance of the revised work instruction on damper 1VDA113, the two right sections were stroked successfully. However, it was found that an interference between the constant force spring assemblies and the manual override lever arms affected manual stroking of the two left sections of the damper. While attempting to stroke the two left sections, Maintenance personnel also observed that the manual override lever arms slipped on their damper blade axles in both sections. The lower left section stroked fully, but the measured force necessary to close the damper was increased by the interference. The upper left section could not be stroked manually due to the interference with the manual override lever arm. An engineering evaluation determined that the interference with the upper left section manual lever arm would not have prevented the damper blades from closing in response to a tornado because the damper blade axle rotated within the friction-fit collar, which would have allowed the damper blades to shut. The evaluation concluded that an operability concern did not exist.

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On January 18, 1994, work was initiated to correct the interference between the constant force spring assemblies and the manual override lever arms. Following the adjustments, the lower left section was stroked successfully. However, after the manual override lever arm on the upper left section was tightened on the damper blade axle, and the lever arm rotated the damper blade axle, the damper blade linkage moved and impacted a gusset installed in the ductwork. This interference had not been discovered earlier because the manual override lever had slipped on the damper blade axle and had not moved the linkage far enough to hit the gusset. This newly-discovered interference was evaluated and determined to be reportable on January 24, 1994.

The tornado exhaust damper is manufactured by American Warming and Ventilating, Inc. as model number NBD-70. The Energy Industry Identification System component function identifier is DMP and the system identifiers are VF and VG.

**CAUSE OF EVENT**

The cause of this condition is an undetected construction interference. A review of the construction documents indicated that the gusset installation was inspected on January 29, 1986, that the damper was cycled twice on April 26, 1986, and that the final inspection of the damper was conducted on May 12, 1986. It could not be determined from the records why the interference was not detected.

**ANALYSIS OF EVENT**

There were no actual safety consequences of this event.

The safety function of tornado dampers is to prevent the rapid depressurization of HVAC systems and buildings in the event of a tornado. The plant main exhaust vent tornado damper (1VDA113) protects several exhaust systems, including the Fuel Handling Building exhaust. The Fuel Handling Building exhaust is the only exhaust system that is safety-related, as it mitigates the consequences of a fuel handling accident and a loss of coolant accident by limiting the site boundary dose within the guidelines of 10CFR100. The simultaneous occurrence of a tornado and a fuel handling accident or a loss of coolant accident could have potential safety consequences. The Severe Weather Guidelines suspend fuel movement during a tornado warning condition, which significantly decreases the risk of a fuel handling accident during a tornado. Therefore, potential safety consequences could result only from the simultaneous occurrence of a loss of coolant accident and a tornado. Based on the STP Probabilistic Safety Assessment, the probability of this occurring is extremely small.

Due to the undetected gusset interference with the damper linkage, from early in 1986 until early in 1994, the Fuel Handling Building exhaust system was not protected at the plant main exhaust vent from the adverse effects of a tornado as provided in the design basis. Therefore, this event is reportable pursuant to 10CFR50.73(a)(2)(ii)(B) in that it represents a condition that was outside the design basis of the plant.

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**CORRECTIVE ACTION**

1. The interference between the damper and gusset was removed by notching the gusset to allow free travel of the damper linkage.

**ADDITIONAL INFORMATION**

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

All Unit 1 tornado dampers have been successfully stroked. The Unit 2 plant exhaust vent tornado damper has also been successfully stroked in accordance with the revised preventive maintenance work instruction.