



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

November 23, 1998  
NOC-AE-000355  
File No.: G26  
10CFR50.73  
STI: 30761424

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

South Texas Project  
Unit 1  
Docket No. STN 50-498  
Licensee Event Report 98-010  
Entry into Technical Specification 3.0.3 for  
Inoperable Fuel Handling Building Exhaust Ventilation System

Pursuant to 10CFR50.73, the South Texas Project Nuclear Operating Company submits the attached Unit 1 Licensee Event Report 98-010 regarding Entry into Technical Specification 3.0.3 for Inoperable Fuel Handling Building Exhaust Ventilation System. This event did not have an adverse effect on the health and safety of the public.

Licensee commitments are found in the corrective action section of the attachment. If you should have any questions on this matter, please contact Mr. S. M. Head at (512) 972-7136 or me at (512) 972-7800.

*G. L. Parkey*  
G. L. Parkey  
Plant Manager,  
Unit 1

KAW/

Attachment: LER 98-010 (South Texas, Unit 1)

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U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
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**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT

FACILITY NAME (1) South Texas, Unit 1		DOCKET NUMBER (2) 05000 498	PAGE (3) PAGE 1 OF 5
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TITLE (4)  
Entry into Technical Specification 3.0.3 for Inoperable Fuel Handling Building Exhaust Ventilation System

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
10	21	98	98	-- 010	- 00	11	19	98		05000
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)										
POWER LEVEL (10) 100	20.2201(b)			20.2203(a)(2)(v)			X 50.73(a)(2)(i)			50.73(a)(2)(viii)	
	20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)			50.73(a)(2)(x)	
	20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)			73.71	
	20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)			OTHER	
	20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)			Specify in Abstract below or in NRC Form 366A	
	20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)				

LICENSEE CONTACT FOR THIS LER (12)

NAME Scott M. Head - Licensing Supervisor	TELEPHONE NUMBER (Include Area Code) (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 EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	VG	MO	R165	YES					

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 October 19, 1998, Unit 1 was in Mode 1 at 100% power. At 1414 hours on October 19, 1998, the Unit 1 Fuel Handling Building Exhaust Booster Fan (11A) was declared inoperable when a ground indication was discovered during a surveillance procedure. It was determined that the fan motor required replacement. The existing design configuration required a temporary modification to isolate the fan/motor from the rest of the system for removal and replacement because the common exhaust and supply plenums associated with the three Fuel Handling Building exhaust booster fans would be breached. During the time the fans are placed in "pull to lock" the Fuel Handling Building ventilation is inoperable, which is a condition prohibited by Technical Specification 3.7.8 and 3.3.2, Table 3.3-3. Both of these conditions would require that Technical Specification 3.0.3 be entered. An enforcement discretion was approved to install and remove the temporary modification. Work was performed on the system and on October 21, 1998, at 1532 hours the train A Fuel Handling Building Exhaust air system was restored to operable status. Corrective actions include a review of preventative maintenance currently performed on the motors, implementation of a plant modification to allow isolation of individual components or trains on-line, determination of root cause for the motor insulation failure, and replacing/repairing all FHB exhaust booster fan motors.

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DESCRIPTION OF EVENT:

On October 19, 1998, Unit 1 was in Mode 1 at 100% power. At 1414 hours on October 19, 1998, the Unit 1 Fuel Handling Building Exhaust Booster Fan (11A) was declared inoperable when a ground indication was discovered during a surveillance procedure. Technical Specifications 3.7.8, and 3.9.12 were entered. It was determined that the fan motor required replacement.

The existing design configuration required a temporary modification to isolate the fan/motor from the rest of the system for removal and replacement because the common exhaust and supply plenums associated with the three Fuel Handling Building exhaust booster fans would be breached. During the time the fans are placed in "pull to lock" the Fuel Handling Building ventilation is inoperable, which is a condition prohibited by Technical Specifications 3.7.8 and 3.3.2, Table 3.3-3. This condition would require that Technical Specification 3.0.3 be entered. The South Texas Project requested discretion from complying with the actions of Technical Specification 3.0.3 during breach of the system to install and remove the temporary modification. The Nuclear Regulatory Commission approved this request.

On October 21, 1998, at approximately 1314 hours, Technical Specification 3.0.3 was entered when all trains of the Fuel Handling Building Exhaust air system were secured to support installation of the temporary modification.

On October 21, 1998, at approximately 1532 hours, the temporary modification was installed and satisfactorily tested, and Technical Specification 3.0.3 was exited when Trains B and C were restored to operable status. Following completion of the motor replacement of fan 11A, Technical Specification 3.0.3 was re-entered on October 22, 1998, at 1411 hours, when all trains of Fuel Handling Building Exhaust Air System were secured to support the removal of the temporary modification.

On October 22, 1998, at approximately 1550 hours, the temporary modification was removed and the post restoration test was completed. Technical Specification 3.0.3 was exited when Trains B and C were restored to operable status. On October 22, 1998, Train A Fuel Handling Building Exhaust air system was restored to operable status following the satisfactory completion of testing and Technical Specifications 3.7.8 and 3.9.12 were exited.

CAUSE OF EVENT:

The cause of entering Technical Specification 3.0.3 was plant design does not support motor repairs in the allowed outage time without shutting down the plant.

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ANALYSIS OF EVENT:

Failure to meet Technical Specification requirements is reportable pursuant to 10CFR50.73(a)(2)(i)(B). The South Texas Project requested enforcement discretion from the provisions of Technical Specification 3.0.3 as it applies to the requirements of Technical Specification 3.7.8 and 3.3.2 (Table 3.3-3 Functional Unit 11) to maintain three independent Fuel Handling Building Exhaust Booster Fans, and three independent Fuel Handling Building Main Exhaust Fans and required actuation instrumentation operable. This request was approved by the Nuclear Regulatory Commission on October 21, 1998. For the removal of the Unit 1 Exhaust Booster Fan motor 11A, Technical Specification 3.0.3 was entered twice in support of installation/restoration of a temporary modification which installed blank plates at the inlet and exhaust of the fan to isolate it from the rest of the system.

The purpose of the Fuel Handling Building HVAC System is to mitigate the consequences of a fuel handling accident as well as a Loss-of-Coolant Accident (LOCA) by limiting plant site boundary dose to within the guidelines of 10CFR100. This is accomplished by routing exhaust air from the spent fuel pool and the remainder of the Fuel Handling Building through HEPA filters and iodine removal carbon filters if high levels of airborne radioactivity are detected in the exhaust air (automatically upon a Safety Injection signal).

Operability of the Fuel Handling Building Exhaust Air System ensures that radioactive material leaking from the Emergency Core Cooling equipment within the Fuel Handling Building, following a loss of coolant accident, and radioactive material release from an accident involving an irradiated assembly in the Fuel Handling Building are filtered prior to reaching the environment.

Normally, exhaust air bypasses the filter units and is exhausted directly to the plant main vent stack. Upon detection of high radiation or Safety Injection signal, exhaust air is routed through the filter units, the exhaust booster fans, and main exhaust air fans, and is then delivered to the plant main vent stack.

Two accident scenarios are relevant with regard to the Fuel Handling Building HVAC system. The Fuel Handling Accident was precluded by ensuring that no loads were carried over the spent fuel pool and no irradiated fuel was moved during the time the repair activities occurred. The Large Break Loss of Coolant Accident, although clearly within the design basis of the plant, is a highly unlikely occurrence. In the event that a Large Break Loss of Coolant Accident were to occur, it would take a minimum of 16 minutes for the Refueling Water Storage Tank to empty and the Emergency Core Cooling System to go into the recirculation mode. At that point it would be assumed that radiation leakage from the Emergency Core Cooling System would require the Fuel Handling Building HVAC system to be in service. Sixteen minutes is ample time to secure the work, restore the plenum, take the fans out of pull-to-lock, and for the workers to exit the Fuel Handling Building.

Compensatory measures were taken during the repairs to ensure that, in the unlikely event emergency operations were required, adequate time was available to manually start the Fuel Handling Building Main and Exhaust fan motors. These included:

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1. Informing the Control Room prior to opening the Fuel Handling Building Exhaust Booster Fan common plenum access panel.
2. Maintaining a watchstander at each opening in continuous communication with the Control Room. The following contingency actions were also in place during the work:
  - Securing work, removing loose material, and reinstalling the access panel to the plenum if at any time during this process a reactor trip occurred or if the Control Room noticed an increase in the Reactor Containment Building radioactivity that would be an indication of a Reactor Coolant System pressure boundary leak.
  - Manually starting the required Fuel Handling Building Main and Exhaust Booster Fans, or placing them in automatic, as required if a reactor trip occurred after plenum integrity is confirmed.

There were no adverse safety or radiological consequences from this event.

CORRECTIVE ACTIONS:

1. A review of existing periodic and preventive maintenance performed on these motors was conducted. Several enhancements were identified for development. These include:
  - Revising the lube/inspection activity
  - Developing new yearly PM activities for insulation resistance testing the booster fan motors
  - Developing new three year PM activities to perform DC step voltage testing

The schedule for completion of this evaluation and testing is provided in the Plan of Action described below.

2. STPNOC is developing a modification that will allow maintenance and/or replacement of a FHB booster fan without rendering the other two fans inoperable. This modification will be implemented for Unit 1 in 1RE08 (spring 1999) and for Unit 2 in 2RE07 (fall 1999).
3. A Technical Specifications change was submitted on September 28, 1998, to allow up to 12 hours to repair an exhaust booster fan, without entering Technical Specification 3.0.3, when all exhaust air systems components would be made inoperable during the maintenance activity.
4. A root cause for the motor insulation failure was completed and indicates that the failure of the Exhaust Booster Fan 11A was due to inadequate insulation design and manufacturing quality.
5. Finalize a plan of action to rewind failed and spare Reliance frame 326TCZ motors to improved standards and systematically replace/repair all FHB exhaust booster fan motors. Details of this plan of action are included below.

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**Plan of Action**

1. Conduct a thorough root cause analysis on the failed Fuel Handling Building (FHB) exhaust booster fan 11A motor. *(Completed November 9, 1998)*
2. Establish a repair contract with a qualified vendor to rewind Safety Class 1E Reliance frame 326TCZ 50-hp motors utilizing the STPNOC specifications. *(Completed November 12, 1998)*
3. Ship the two failed motors to the qualified vendor for rewind by November 30, 1998.
4. After one newly rewound motor is returned to the STPNOC warehouse, send the remaining spare motor to a qualified repair vendor for diagnostic testing and rewind. Evaluate the results of diagnostic testing by April 15, 1999.
5. Install plant modification in Unit 1 during the 1RE08 (Spring 1999) refueling outage to facilitate FHB exhaust booster fan motor removal and replacement.
6. Systematically replace Unit 1 motors with upgraded spares prior to 1RE09 while rewinding and restocking the warehouse spares.
7. Install plant modification in Unit 2 during 2RE07 (Fall 1999) refueling outage to facilitate FHB exhaust booster fan motor removal and replacement.
8. Systematically replace Unit 2 motors with upgraded spares prior to 2RE08 while rewinding and restocking the warehouse spares.

In addition, the following items have been incorporated in the STPNOC preventive/predictive maintenance programs to closely monitor the performance of the FHB Exhaust Booster Fan motors:

1. Improved insulation resistance testing practices that consider temperature correction and humidity have been implemented.
2. Testing on both the U1 and U2 FHB Exhaust Booster Fan motors has been completed as of November 5, 1998.
3. DC step voltage PMs have been developed and are being scheduled for performance.
4. Vibration monitoring parameters have been adjusted to capture high frequency peaks that could indicate potentially loose stator coils.

ADDITIONAL INFORMATION:

There have been three prior failures of a Fuel Handling Building Exhaust Booster Fan, in 1987, 1992, and 1998. In July 1987, prior to issuance of the initial Operating License, an Exhaust Booster Fan motor failed. The cause was determined to be a random failure of the motor and the motor was replaced. On August 15, 1992, a fan motor had an existing ground when it failed during a surveillance. In April of 1998, Unit 1 LER-98-004 reported a fan motor that had an existing ground when it failed while being restored from a surveillance test. The April 1998 failure exhibited similar symptoms as the October 1998 failure.

The fan motor is a Reliance 50 HP, 460 Volt, 3PH, 60 Hz, Frame 326TZC. The fan is a vaneaxial type Model number 36-26-1770 (2-stage). The failure of this type of motor at STP was not a substantial safety hazard per 10CFR21.