

The Light company

Houston Lighting & Power

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

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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
Special Report Regarding a Standby Diesel Generator #11
Nonvalid Failure on December 12, 1991

Pursuant to the South Texas Project Electric Generating Station (STPEGS) Technical Specifications 4.8.1.1.3 and 6.9.2, Houston Lighting & Power submits the attached Special Report regarding a Standby Diesel Generator (SDG) #11 nonvalid failure which occurred on December 12, 1991.

If you should have any questions on this matter, please contact Mr. C. A. Ayala at (512) 972-8628 or me at (512) 972-7205.

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CAA/lf

Attachment: Special Report Regarding a SDG #11
Nonvalid Failure on December 12, 1991

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South Texas Project Electric Generating Station

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South Texas Project Electric Generating Station
Unit: 1
Docket No. STN 50-498
Special Report Regarding a Diesel Generator #11
Nonvalid Failure on December 12, 1991

DESCRIPTION OF EVENT:

On December 12, 1991 at 0208 hours, Unit 1 was in Mode 1 at 100% power. During performance of procedure 1PSP03-DG-0001, Standby Diesel 11 Operability Test, with the engine at full load, 5600 kW, the generator output breaker tripped open due to instantaneous direction overcurrent. Prior to the opening of the breaker, Standby Diesel Generator (SDG) #11 was started in the emergency mode in accordance with the procedure and attained rated speed, voltage, and frequency within the 10 second time limit. The SDG was released from the emergency mode and paralleled to the grid to load the engine. After SDG #11 was at full load, three attempts were made to raise reactive load above 3400 kVAR to obtain the most efficient operating reactive load conditions which is between 3400 and 3600 kVAR. This was accomplished by lowering to 3100 kVAR and then raising to 3400 kVAR. The generator would not go above 3400 kVAR. On the second and third attempts to raise the reactive load, the voltage adjusting switch was released when reactive load would not go above 3400 kVAR. Approximately six minutes after the generator was at full load, the reactive load meter pegged high, the volt meter reading raised to approximately 5.0 kV (SDG design voltage is 4.16 kV) and the output breaker subsequently tripped open. The main control room indications were 4.9 kV, 0 kVAR, 61.2 Hz, and 0 Amps. No switches were being manipulated at the time.

The design of the SDG voltage regulator is such that when in the emergency mode, the instantaneous preposition board functions to bring the SDG up to the designed emergency bus voltage of approximately 4.16 kV, without the need for operator action. Once released from the emergency mode, relay contacts on this board change state and the current path bypasses the fixed resistance reference voltage circuitry and is routed directly from a motor operated potentiometer (MOP) to the voltage regulator.

It is suspected that the MOP was driven to the maximum limit when attempting to go above 3400 kVAR during the third attempt and a contact problem in the preposition board affected the circuit resistance, thereby not initially allowing the increase in kVAR and voltage. With the preposition board adversely affecting the voltage regulating circuit, the MOP setting which normally would raise the SDG reactive load, did not result in voltage regulator response until the preposition board changed state. After approximately six minutes of operation, current flow or energization of the preposition board contacts led to a decrease in contact resistance (i.e., the problem cleared itself) which subsequently changed the signal to the voltage regulator, causing the over-voltage condition.

CAUSE OF EVENT:

The cause of this event is attributed to high resistance of relay contacts within the instantaneous preposition board which affected control of kVAR and voltage in the parallel mode.

ANALYSIS OF EVENT:

This incident is classified as a nonvalid failure since SDG #11 operated satisfactorily in the emergency mode and if challenged would have performed its safety function. The voltage regulation problems were experienced only after the SDG was released from emergency to test mode. This voltage regulation circuit is bypassed in the emergency mode.

CORRECTIVE ACTIONS:

1. The instantaneous preposition board was replaced.
 2. STPEGS will perform a detailed analysis of the preposition board and the SDG relay panel environment to determine the cause for high resistance of the relay contacts on the board. This analysis will be completed by March 26, 1992. Additional corrective actions will be developed as necessary.
- STPEGS will inspect similar relays on other SDGs at STPEGS for high contact resistance by June 12, 1992.

ADDITIONAL INFORMATION:

Per Technical Specification 3.8.1.1, there has been one valid failure in the last 20 valid tests and one valid failure in the last 100 valid tests on SDG #11; therefore, the testing frequency will remain at once per 31 days.