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February 16, 1988
ST-HL-AE-2512
File No.: G02
10CFR50.36(c)(5)

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
Two Diesel Generator Non-Valid Failures

Pursuant to the South Texas Project Electric Generating Station Technical Specifications 4.8.1.1.3 and 6.9.2 Houston Lighting & Power submits the attached Special Report regarding two diesel generator non-valid failures.

The cause of the failure has been attributed to failure of a diaphragm in a test mode trip pilot valve. An investigation into the cause of the failure of the diaphragm is being conducted. A follow-up report will be submitted by April 4, 1988.

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

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Plant Operations

GEV/CAA/bs

Attachment: Special Report Regarding Two
Diesel Generator Non-Valid Failures

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DESCRIPTION OF EVENTS:

On January 16, 1988, an Engineered Safety Feature (ESF) auto-start test of Standby Diesel Generator (SDG) #12 was being performed per surveillance procedure 1PSP03-DG-0011. At 2221 hours CST, the SDG was started in the emergency mode. When the SDG was released from the emergency mode, the engine tripped. A Maintenance Work Request (MWR) was written to investigate the problem but the engine was not declared inoperable because it had successfully started in the emergency mode. However, work on this problem was not initiated until after the second non-valid failure, described below, which occurred 20 days later. This delay occurred because the nature of the failure did not make the SDG inoperable and it was not recognized that the problem needed to be fixed before the next test required to be performed on the SDG.

On February 5, 1988, plant operators attempted to perform the monthly operability surveillance on SDG #12, per procedure 1PSP03-DG-0002. The engine was started in the emergency mode at 0250 hours CST, was released from the emergency mode and was loaded to approximately 72% of rated load when the engine tripped. The Unit Supervisor stated that there were no local or Control Room alarms prior to the trip. A local lube oil alarm came in after the trip. The engine was re-started in the test mode at 0320 CST to troubleshoot the lube oil system. The engine started and ran for approximately 5 minutes before tripping. Again there were no alarms prior to the trip and local indications of engine lube oil pressure were normal. An MWR was written to investigate the problem. The operator declared the SDG inoperable at 0806 CST.

The system engineers believed that the absence of alarms indicated the control air reset header was not maintaining adequate pressure to operate in the test mode. I&C technicians were instructed to install temporary pressure gages on the control air reset header and on the air line controlling the test mode safety trip valve (N1DG-PV-5576C). At least 20 psig air pressure must be maintained on the control air reset header to operate in the test mode. The engine was re-started in the test mode at 1122 CST with temporary gages installed in order to determine the actual pressures in the control air system. Pressure on the reset header was seen to drop from about 30 psig to 22 psig within one minute but the engine did not trip. The test mode safety trip pilot valve (N1DG-PV-5577A) was leaking air past its diaphragm which caused a pressure reduction in the reset header. A replacement part was installed and the engine was re-started at 1825 CST with temporary gages still installed. (The documentation for this work has not yet been completed.) Reset header pressure was maintained at 37.5 psig, equal to the setting of the pressure regulator upstream of the trip pilot valve. Temporary gages were removed and a successful operability surveillance was performed between 1911 and 2026 CST. The SDG was returned to service at 2224 CST.

When the test mode trip pilot valve was disassembled, an internal diaphragm was found defective such that it leaked air. This resulted in a reduced pressure in the reset header that was near the setpoint of the trip pilot valve. This condition made the trip pilot valve susceptible to initiating an engine trip whenever a slight pressure fluctuation (reduction) occurred in the non-essential control air system.

The engine was declared inoperable from 0806 to 2224 CST on February 5, 1988. In fact, the SDG would have been able to start and load in the emergency mode because the test mode trip pilot valve is not operative in the emergency mode. For this reason and in accordance with paragraph C.2.e.2 of Regulatory Guide 1.108, these failures have been determined to be non-valid. The two non-valid failures described in this report are the first and second non-valid failures of SDG #12 since fuel load licensing at Unit 1. There have been no valid failures and 12 valid tests of SDG #12 since fuel load licensing. The current surveillance test interval remains, therefore, at 31 days.

ROOT CAUSE

Both non-valid failures were caused by the failure of the diaphragm in the test mode trip pilot valve, N1DG-PV-5577A. The cause of the failure of the diaphragm has not been determined.

GENERIC IMPLICATION

Similar non-valid failures due to malfunction of the test mode trip pilot valve are possible on Unit 1 and Unit 2 SDG's.

CORRECTIVE ACTION

An investigation to determine the cause of the diaphragm failure is being undertaken. Corrective action will be established based on the results of this investigation. A followup report will be provided by April 4, 1988.