GULF STATES UTILITIES COMPANY

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U. S. Nuclear Regulatory Commission
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Gentlemen:

River Bend Station - Unit 1
Docket No. 50-458

Enclosed is Gulf States Utilities Company's Special Report concerning a valid failure of the Division III diesel generator. This report is being submitted pursuant to River Bend Station Technical Specifications 4.8.1.1.3 and 6.9.2.

Sincerely,

J. E. Booker
Manager-River Bend Oversight
River Bend Nuclear Group

JEB/TFP/RGW/JHM/TES/ch

cc: U. S. Nuclear Regulatory Commission
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SPECIAL REPORT

At 1343 on 5/29/89, a valid failure was experienced on the Division III diesel generator (DG) due to the failure of the DG to reach minimum speed and voltage within the maximum Technical Specification time requirements during the performance of surveillance testing. The following information is provided in accordance with Regulatory Guide 1.108.

Diesel Generator Unit Designation and Number: Division III, 1E22*EGS001

Investigation:

At 1337 on 5/29/89, while performing Surveillance Test Procedure (STP)-309-0203, "Division III Diesel Generator Operability Test", timing of the DG start indicated failure to conform with maximum allowable time limits of Technical Specification 4.8.1.1.2.a.4. The maximum time allowed to reach 882 rpm, 3740 volts and 58.8 Hz is 10 seconds. The recorded time to reach 882 rpm was 11.26 seconds and the recorded time to reach 3740 volts was 13.29 seconds. The recorded time to reach 58.8 Hz was 9.98 seconds.

In an effort to determine the cause of the slow start, data on the 38 starts of the Division III DG since 4/25/89 was reviewed. For the nine valid test starts, timing was found to be acceptable for seven. The two unacceptable starts included a failure on 4/26/89 (reference RBG-30962 dated 5/26/89), and this failure. For the 29 invalid tests performed to troubleshoot the starting problem, 25 had acceptable start times. During the unacceptable starts, it was observed that the governor failed to move the fuel rack to the "Full Open" position immediately after receiving the start signal. During the starting sequence, the starting air pressure being admitted to the pneumatic booster pressurizes the governor oil supply before the DG starts to roll. The governor then reacts by moving the fuel rack to the "Full Open" position provided the shutdown solenoid is deenergized. After the air start motors have rotated the diesel to approximately 150 rpm, the air start motors stop and the DG accelerates itself to operating speed of 900 rpm. Any hesitation in moving the fuel rack to its "Full Open" position would delay the beginning of the engine cylinder firing which would result in a delay of DG start. Examination of the air supply found that the shuttle valve was corroded and that internal rust particles were present. These conditions could have resulted in a failure to pressurize the pneumatic booster. After this valve was replaced, two of the next five troubleshooting starts had unacceptable timing. Therefore, the condition of this valve was not the entire problem.

Investigation into the DG starting system identified two other possible items that could have contributed to the slow starts. The governor needle valve may have been open too far which could have caused a longer time for the governor to stabilize to 60 cycles per second following the start signal. The governor needle valve was adjusted from 1 and 1/8 turn open to 3/4 turn open. Governor stabilization on start was faster following this adjustment. Additionally, the shutdown solenoid may have been incorrectly holding the governor in the shutdown position. The top of the governor was replaced. This included the shutdown solenoid, Bodine synchronizer motor and the male end of the 14 pin Cannon plug. It was noted during this replacement that the

Cannon plug had internal scale build-up. Thorough cleaning of this plug was performed. The bench testing of the replacement shutdown solenoid indicated that it was stronger and more reliable in its operation.

Corrective Action:

The exact cause of the failure has not been specifically identified. Each of the components that could have contributed to the failure of the fuel rack to immediately reposition were inspected and/or replaced, as necessary. This included the inspection of the air start strainers, replacement of the shuttle valve that directs air to the pneumatic booster and replacement of the top governor plate assembly, including the shutdown solenoid. During reassembly, the female end of the Cannon plug was carefully cleaned to remove the scale deposits which had been found. Troubleshooting starts after this work was completed indicated DG speed, voltage and frequency times to be well within Technical Specification limits. This timing also showed start times to be faster than had been experienced during past testing of the Division III DG.

Satisfactory performance of STP-309-0203 was completed at 0200 on 6/6/89 and the DG was returned to operable status. Three additional valid tests were performed on 6/11/89, 6/18/89 and 6/27/89. These additional tests exhibited starting times within the Technical Specification limits.

Length of Time Unavailable:

Length of time between the time of the failure, at 1343 on 5/29/89, and restoration of Division III DG to operable status, at 0200 on 6/5/89, was 7 days and 12 hours. During this time period, River Bend Station was in its second refueling outage and this DG was not required to be operable to support plant activities. The Division I and Division II DGs were both operable during the 7 days and 12 hours the Division III DG was inoperable.

The Division III DG was physically out of service for 34 hours due to inspection of the air start strainers, replacement of the 3-way shuttle valve and replacement of governor top plate assembly. During the remainder of this 7 day 12 hour period, the DG was administratively inoperable, yet it was available to respond to an emergency signal. STP-200-0603, "Division III Remote Shutdown System Control Circuit Operability Test," was satisfactorily completed at 2302 on 6/3/89, but due to the DG being loaded less than 60 minutes during the performance of this test, the test could not be considered to be a valid test per Regulatory Guide 1.108. Also during this period, troubleshooting starts and loading were being performed.

Current Surveillance Interval:

Division	I	Monthly
Division	II	Monthly
Division	III	Weekly

Test Intervals Conform to Technical Specification: YES

Failures for Div I:	0	valid failures in the last 20 valid tests
	1	valid failures in the last 100 valid tests
Failures for Div II:	0	valid failures in the last 20 valid tests
	4	valid failures in all 85 valid tests conducted
Failures for Div III:	2	valid failures in the last 20 valid tests
	2	valid failures in all 85 valid tests conducted

Number of Valid Failures in Last 100 Valid Tests of All Diesel Generators at River Bend Station: 2