

GULF STATES UTILITIES COMPANY

RIVER BEND STATION

JST OFFICE BOX 220

ST FRANCISVILLE, LOUISIANA 70775

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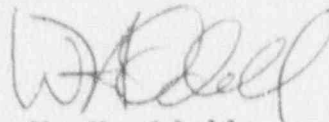
U. S. Nuclear Regulatory Commission
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Gentlemen:

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 I diesel generator at River Bend Station. This report is submitted pursuant to River Bend Technical Specifications 4.8.1.1.3 and 6.9.2.

Sincerely,



W. H. Odell
Manager-Oversight
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SPECIAL REPORT

At 0030 on 02/20/91 during the performance of scheduled monthly surveillance test, STP-309-0201, "Division I Diesel Generator Operability Test", the jacket water and lube oil temperatures were observed increasing above their normal ranges. The diesel had been running at 100% load for 30 minutes when this occurred. To prevent the overheating of diesel components, Operations reduced the load, opened the output breaker and secured the diesel generator. During this surveillance test, the load was not maintained for greater than 60 minutes. Therefore, in accordance with Regulatory Guide 1.108 position C.2.e 6, this is considered a Valid Failure. Consequently, this Special Report is submitted pursuant to Regulatory Guide 1.108, position C.3.b and Technical Specification 4.8.1.1.3.

INVESTIGATION

The planned February Division I diesel generator outage began at 0750 on 01/19/91 when the diesel was placed in the maintenance mode. After completion of the scheduled preventative maintenance tasks, the diesel was restored to operational mode at 1640. The diesel was started at 2334 and loaded to 100% (greater than 3000 kw) at 2350 per STP-309-0201. Normal observation of instrumentation indicated that cooling of the jacket water system was inadequate. At this time the Operator in the diesel building manually adjusted the temperature control valve, 1EGT*TCV20A, in the "close bypass" direction. No temperature changes were observed following this adjustment. A decision was made to reduce the load and secure the diesel to eliminate any possible damage or a diesel trip due to high lube oil or jacket water temperature.

After the diesel had cooled, a test run was performed at 0400 on 02/20/91. During this run a careful examination of lube oil and jacket water temperatures was performed. When the DG was loaded to 100%, temperatures again started rising above the normal ranges (jacket water 'JW' = 183 degrees F and lube oil 'LO' = 180 degrees F) and manual repositioning of the temperature control valve (TCV) was again performed. This time the valve repositioned itself and temperatures immediately decreased (JW = 133 degrees F, LO = 167 degrees F). The TCV was then repositioned back to its normal setting, and the diesel was run for over 60 minutes at full load with proper temperatures being maintained (JW = 157 to 162 degrees F and LO = 173 to 175 degrees F).

The investigation into the cause of the temperature increase indicated that the thermostatic temperature control valve appeared not to open to allow jacket water to flow through heat exchanger, 1EGT*E1A.

CAUSE OF FAILURE

An inspection of the valve internals was performed to determine the nature of the malfunction. The poppet cylinder and seat insert were in good condition. There was adequate clearance around the poppet cylinder, due to the deletion of an o-ring (reference NRC Information Ncti 82-56), thus preventing binding at this location.

In this valve the return spring (or load spring) seats the valve body on the underside of the poppet. Its function is to close the valve until temperature rises to the level where thermostatic elements, or power pills, open the valve. When the valve opens, the stem, which houses the power pills, slides inside the load spring. There was evidence of some resistance to sliding between the retainer and stem. Surface discoloration, scratching, and small nicks were found on the stem. This is indicative of binding. Disassembly of the stem found debris (fine dirt and small flakes of rust) inside. In removing 2 of the 3 power pills, from the spacer sleeve in the stem, resistance to movement was also found. These two power pills were unable to properly function. The root cause of the failure was debris in the temperature control valve internals. All interior surfaces of the valve were cleaned. All parts internal to the stem, where binding had occurred, were replaced. The new power pills were bench tested in a bath of water to ensure they began to open at 160 degrees F and were fully open at 175 degrees F.

Note that a different rust inhibitor has been used in the jacket water systems since refueling outage 2, 06/01/89. During refueling outage 3, 10/90 - 11/90, the jacket water was drained and refilled several times. A "feed and bleed" was later performed which decreased the particulate iron oxide from 220 PPM to 12.5 PPM. Monitoring of jacket water samples has indicated the level of iron oxide particles has remained at the level of 12.5 PPM since refueling outage 3.

The valve was reassembled and a test run of the diesel was performed at 1644 on 02/21/91. During this run, it was necessary to manually adjust the TCV. However, this is normally expected after the valve has been overhauled.

Performance of STP-309-0201, to demonstrate diesel operability, began with a start at 2103 and a successful completion at 2239 on 02/21/91. During this run, the TCV operated satisfactorily and maintained jacket water and lube oil temperatures within their normal ranges, 157 to 162 degrees F and 173 to 175 degrees F, respectively.

CORRECTIVE ACTION

Cleaning and replacement of internal parts on the temperature control valve satisfactorily restored it to a reliable condition. A preventive maintenance task (ME03585) was initiated to have the Division 1 temperature control valve, 1EGT*TCV20A, disassembled and inspected each refueling outage to eliminate future build up of debris resulting in valve movement restriction. A similar preventive maintenance task (ME03586) was initiated to perform the same work on the Division 2 temperature control valve, 1EGT*TCV20B.

Since this was the 2nd failure of the Division 1 diesel generator within the last 20 valid tests, the test frequency was changed from once in 31 days to once in 7 days per Tech. Spec. Table 4.8.8.1.2-1. STP-309-0201 was subsequently performed with successful starts at 0134 and 1411 on 02/22/91, and 1328 on 02/27/91. After these tests were satisfactorily completed, the number of valid failures in the last 20 valid tests was reduced to one. This allowed the frequency of surveillance test, STP-309-0201, to be changed back to once in 31 days.

OPERATING START/TEST DATA

DIESEL GENERATOR MARK NUMBER:

1EGS*EG1A

LENGTH OF TIME DIESEL GENERATOR
WAS OUT OF SERVICE:

46 HOURS

SURVEILLANCE INTERVAL FOLLOWING FAILURE:

DIVISION I: MONTHLY
DIVISION II: MONTHLY
DIVISION III: MONTHLY

TEST INTERVALS CONFORM TO TECHNICAL SPECIFICATIONS? YES

FAILURES FOR DIVISION I:

1 VALID FAILURE IN THE LAST 20 VALID TESTS
2 VALID FAILURES IN THE LAST 100 VALID TESTS

FAILURES FOR DIVISION II:

0 VALID FAILURES IN THE LAST 20 VALID TESTS
2 VALID FAILURES IN THE LAST 100 VALID TESTS

FAILURES FOR DIVISION III:

1 VALID FAILURE IN THE LAST 20 VALID TESTS
4 VALID FAILURES IN THE LAST 100 VALID TESTS

CUMULATIVE FAILURES FOR ALL RIVER BEND DIESEL GENERATORS:

4 VALID FAILURES IN THE LAST 100 VALID TESTS