GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

AREA CODE 504 635-6094 346-8651

June 15, 1985
RBG- 21,290
File No. G9.5

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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

Enclosed for your review is the Gulf States Utilities Company (GSU) response to the verbal requests from Mr. Emmett Murphy of the Nuclear Regulatory Commission (NRC) Staff regarding the status of corrective action on five recent 10CFR21 notices issued by Transamerica Delaval, Inc. (TDI). Attachment 1 summarizes each GSU Deficiency Report (DR) while the enclosures contain copies of the GSU responses previously provided.

Sincerely,

J. E. Booker

J. E. Booker
Manager-Engineering,
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/JRH/LAE/JWL/je

ORIGINAL TO RBG FILE
AND: EMMETT MURPHY, ORAB

IE19
1/1

ATTACHMENT 1

1. GSU Deficiency Report (DR) No. 288, "Polycarbonate Air Filter Bowls." Enclosure 1 contains a copy of the evaluation letter from J. E. Booker (GSU) to R. D. Martin (NRC - Region IV) dated May 3, 1985 (GSU Letter No. RBG-20893).

2. GSU DR No. 291, "Crankshaft Plugs in the Standby Diesel Generators." Enclosure 2 includes a copy of the evaluation letter from J. E. Booker to R. D. Martin dated April 17, 1985 (GSU Letter No. RBG-20746).

   In addition, the following discussion provides additional details on the replacement of defective and potentially defective crankshaft plugs, and on the tests and inspections which verified the absence of consequential damage.

   All crankshaft plugs have been dimensionally and liquid penetrant inspected. All 22-gauge plugs have been removed and replaced with heavier, 16-gauge plugs by TDI, using factory tooling.

   The tests and inspections for consequential damage were developed based on an analysis of the possible effects of the internal lubricating oil leak. The open area of the ruptured plug was approximately 30 percent of the 15/16-inch diameter oil hole (0.21 sq. in.). Calculations estimated the loss of oil from the leaking plug at 9 percent of the flow to the header. The effect of the leak would be to reduce the oil flow to the No. 1 cylinder connecting rod bearing, and from there to the piston wrist pin bushing, piston crown, and piston rings.

   The tests and inspections consisted of the following:

   1. The connecting rod bearing and the piston pin bushing were "bump checked" for clearance. The results showed the clearances to be within new limits, indicating the absence of excess wear on the bearings.

   2. The keepwarm oil pump was started, and oil samples were taken from the return flow from the piston crown on No. 1 cylinder and No. 8 cylinder for comparison. The purpose of this test was to detect wear particles from the connecting rod or the piston pin bushing which would have been trapped in the piston crown if damage had occurred to the bearings. The results of the oil analysis showed no increase in wear metals for No. 1 cylinder.

   3. The cylinder liners were visually inspected by TDI service engineer and by GSU personnel and found satisfactory. There was no evidence of increased wear on No. 1 cylinder.

   4. The engine was operated at 3000 KW, shut down, and crankshaft covers were opened for a heat check. The temperatures of the piston and connecting rods for No. 1 cylinder and No. 8 cylinder were measured by an infrared thermometer. Both cylinders were the

same temperature (175°F) which is normal and consistent with previous measurements. This confirms the absence of bearing distress.

5. Cylinder firing pressure measurements were taken on No. 1 and No. 2 cylinders. Both cylinders indicated 1350 psig. This confirms satisfactory condition of the piston rings.

These tests and inspections, together with subsequent satisfactory operation of the engine, demonstrate the absence of consequential damage as a result of the failed plug.

The absence of damage is attributed to the early detection of the problem by Maintenance personnel before the rupture was detected on March 9, 1985 during routine inspection for blocked or leaking oil passages. The plug is known to have been intact on March 2, 1985, because oil samples were taken from the crankcase at No. 1 and No. 8 cylinders with the keepwarm oil pump operating. The test engineer and the plant engineer who took the samples observed normal oil flow at that time. Therefore, the failure occurred between March 2 and March 9, 1985. During that period, the engine was operated three hours or less.

3. GSU DR No. 298, "Air Start Check Valves." GSU has not completed its evaluation on this 10CFR21 Notice. GSU has purchased replacement valves manufactured by TRW and they have been received on-site. The disassembly and inspection of the Williams valves as recommended in the 10CFR21 Notice will be performed when the Williams valves are removed. No other valves manufactured by Williams Gauge Co. are installed in the standby diesel generators.

4. GSU DR No. 299, "Fuel Oil Back Pressure Regulators." Enclosure 3 contains a copy of the evaluation letter from J. E. Booker to R. D. Martin dated June 6, 1985 (GSU Letter No. RBG-21,223).

5. GSU DR No. 313, "Excessive Temperatures in Engine Control Panels." GSU has not completed its evaluation report on this 10CFR21 Notice; regardless, a modification is in progress to provide additional cooling to the Generator Control Panel (exciter control cabinet).

ENCLOSURE 1
PAGE 1 of 1

GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

AREA CODE 504 635-6094 346-8651

May 3, 1985
RBG- 20893
File Nos. G9.5, G9.25.1.1

Mr. Robert D. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, te 1000
Arlington, Texas 76011

Dear Mr. Martin:

River Bend Station - Unit 1
Docket No. 50-458
Final Report/DR-288

Gulf States Utilities Company (GSU) has completed its evaluation of DR-288 concerning polycarbonate air filter bowls in the engine control panel for the standby diesel generators supplied by Transamerica Delaval, Incorporated. On April 3, 1985, GSU notified Region IV by telephone that it had determined DR-288 to be reportable under 10CFR50.55(e). However, subsequent examination revealed that the bowls initially documented as polycarbonate filter bowls were in fact metal bowls. Since there is no hardware deficiency, GSU has determined this condition does not meet the reporting criteria of 10CFR50.55(e).

Sincerely,

J. E. Booker

J. E. Booker
Manager-Engineering,
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/PJD/trp

cc: Director of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC Resident Inspector-Site

Nuclear Document Control

MAY 13 1985

8505231235 1p

ENCLOSURE 2
PAGE 1 of 3

GULF STATES UTILITIES COMPANY
POST OFFICE BOX 299 • BEAUMONT, TEXAS 77704
AREA CODE 713 838 6631

April 17, 1985
RBG- 20,746
File Nos. G9.5, G9.25.1.1

Mr. Robert D. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Dear Mr. Martin:

River Bend Station Unit 1
Docket No. 50-458
Final Report/DR-291

On March 18, 1985, GSU notified Region IV by telephone of DR-291 concerning the crankshaft plugs on the standby diesel generators supplied by Transamerica Delaval, Incorporated. GSU had determined that DR-291 is reportable under 10CFR50.55(e). The attachment to this letter is GSU's final 30-day written report pursuant to 10CFR50.55(e)(3) with regard to this deficiency.

Sincerely,

J. E. Booker

J. E. Booker
Manager-Engineering,
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/PJD/lp

Attachment

cc: Director of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC Resident Inspector-Site

INPO

Nuclear Document Control
APR 19 1985

8505010256 3pp.

ATTACHMENT

April 17, 1985
RBG- 20,746

DR-291/Crankshaft Plugs on the Standby Diesel Generators Supplied by Transamerica Delaval, Incorporated

Background and Description of the Problem

On March 9, 1985, during a scheduled post test inspection of standby diesel generator A (1-EGS*EG1A) supplied by Transamerica Delaval, Incorporated (TDI), the proper oil flow inside the diesel engine was examined. The inspection revealed that the oil plug (TDI part No. R-3149) in the No. 1 cylinder crankshaft throw was partially ruptured as described in Nonconformance and Disposition Report (N&D) No. 10,886. The cylinder 1 plug was a 22 gauge plug.

The function of the crankshaft plug is to seal the entry hole drilled in the crankshaft to establish communication between the oil holes in the main bearing journal and the connecting rod bearing journal. In operation, lubricating oil is supplied under pressure of approximately 50 psig to the main bearing. A portion of the oil flows from the main bearing through the drilled passage to the connecting rod bearing. A drilled passage in the connecting rod supplied oil to the piston pin bushing, piston crown, and piston rings.

According to TDI, the original design of the crankshaft oil plug was released in December 1965 and called for the plug to be stamped from 16 gauge sheet metal which is approximately 60 mils in thickness. In March of 1980, the plug material was changed to 22 gauge sheet metal for "ease of assembly". Twenty-two gauge sheet metal is approximately 30 mils in thickness. TDI returned to the original 16 gauge material in June 1982 because of failures in other engines and shop experience indicating that the thinner material was more likely to be damaged during the installation process.

The concern with the 22 gauge plugs was identified by the TDI Diesel Generator Owner's Group, and a sample of two plugs was inspected at River Bend (cylinders 7 and 8 on standby diesel A). Both of these plugs were found to be 16 gauge plugs, which resolved the concern at that time.

All crankshaft plugs in both TDI diesel generators were dimensionally inspected. The remaining seven plugs in diesel A were found to be 16 gauge plugs. All eight plugs in diesel B were found to be 22 gauge plugs.

The failed plug was returned to TDI for evaluation. The results on TDI's evaluation are not yet available; however, it can be concluded that the 22 gauge plugs failed as a result of low-cycle fatigue associated with repeated pressurization during engine starts and stops. The failure is attributed to inadequate design and inadequate sampling during field preservice inspection.

Safety Implication

The open area of the rupture was approximately 30 percent of the 15/16 inch diameter oil hole, producing an internal lubricating oil leak from the No. 1 cylinder to the engine sump. The leakage would reduce the lubricating oil flow to the No. 1 cylinder connecting rod bearing, and from there to the piston wrist pin bushing, piston crown, and piston rings. If the failure had remained uncorrected, further operation could have resulted in failure of the remaining portion of the plug, and a greatly increased leakage flow. Therefore, it is conservatively assumed that if the failure had remained uncorrected after the post test inspection, then standby diesel A could have become inoperable in subsequent operation thereby adversely affecting the safe operation of the plant. The same condition might have occurred on diesel generator B, since it also had 22 gauge plugs.

Corrective Action

Crankshaft plugs were 100% dimensionally inspected, and all 22 gauge plugs were removed and replaced with 16 gauge plugs, using TDI factory personnel and tooling.

Standby diesel generator A was given a series of tests and inspections to detect possible consequential damage prior to return to service, as described in N&D 10,886. No damage was detected.

GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

AREA CODE 504 635-6094 346-8651

June 6, 1985
RBG- 21223
File Nos. G9.5, G9.25.1.1

Mr. Robert D. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Dear Mr. Martin:

River Bend Station - Unit 1
Docket No. 50-458
Final Report/DR-299

On June 5, 1985, GSU notified Region IV by telephone that it had determined DR-299 concerning backpressure regulating valves (1EGS*EG1A and 1EGS*EG1B) in the fuel oil return line for the standby diesel generators supplied by Transamerica Delaval, Incorporated to be reportable under 10CFR50.55(e). The attachment to this letter is GSU's final 30-day written report pursuant to 10CFR50.55(e)(3) with regard to this deficiency.

Sincerely,

J. E. Booker

J. E. Booker
Manager-Engineering,
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/PJD/amg

Attachment

cc: Director of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC Resident Inspector-Site

INPO

8506240618 3pp

ATTACHMENT

June 6, 1985
RBG- 21223

DR-299/FUEL OIL BACKPRESSURE REGULATORS

Background and Description of the Problem

The deficiency concerns backpressure regulating valves 1EGS*EG1A and 1EGS*EG1B in the fuel oil return line between the standby diesel engine and its fuel oil day tank for each system. The standby diesel generators were supplied by Transamerica Delaval, Incorporated. The subject valves (one per engine) were purchased by Stone and Webster Engineering Corporation (SWEC) under Purchase Order No. RBS-247.501-240 from Target Rock Corporation. The manufacturer's Drawing No. 750-10-2 (SWEC File No. 247.501-240-14C) shows a detailed assembly of the valve. The valves were purchased with ASME certification and were installed in each fuel oil return line in ASME piping. Each valve is set at 30 psig in order to keep this regulated pressure on the engine's fuel oil header.

The fuel injectors injecting fuel into the engine cylinders during engine operation set up pulsations that extend through this fuel oil return line to the day tank. The subject valve in the return line is called upon to make as many regulations as pulsations, causing premature failure of the adjusting bellows. This in turn causes fuel oil to spray out of a weep hole in the valve bonnet.

The valve application for the required duty cycle is incorrect, causing metal failure of the regulator bellows.

Safety Implication

Failure of a valve can cause fuel oil to spray into the diesel room during diesel generator operation, with a potential fire hazard if not detected.

Had the problem remained uncorrected, the premature failure of the valve could have resulted in a fire in the diesel generator room. Whereas the RBS plant is designed to be safely shut down should a transient fire occur in a single fire area, the above problem was common to both Division I and II diesel generators; hence, a transient fire conceivably could have occurred in two different fire areas, resulting in a loss of both standby diesel generators and thereby adversely affecting the safe operations of the plant.

Corrective Action

The subject valves were replaced with non-ASME valves suited to the application. Although the valves are non-ASME, they are functioning satisfactorily.

An attempt was made to purchase replacement ASME pressure regulating valves different from the original design, but it was found that such valves are not available. In order to maintain the Category I rating of this portion of the diesel generator system, a multidiscipline task force was initiated to evaluate the design and resolve the subject concerns.

The task force is currently evaluating the performance and capability of the installed non-ASME valves. Its goal is to furnish sufficient evidence and analysis to qualify the non-ASME valves for their Category I function in support of the standby diesel generators.