Entergy Operations

Entergy Operations, Inc.
P.O. Box B
Killona, LA 70066
Tel 504-464-3120

D. F. Packer
General Manager
Plant Operations
Waterford 3

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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Reporting of Special Report

Gentlemen:

Attached is Special Report Number SR-94-003-00 for Waterford Steam Electric Station Unit 3. This Special Report is submitted in accordance with Technical Specifications 4.8.1.1.3 and 6.9.2 and USNRC Regulatory Guide 1.108.

Very truly yours,

D.F. Packer
General Manager - Plant Operations

DFP/CJT/tjs
Attachment
cc: L.J. Callen, NRC Region IV
G.L. Florreich
J.T. Wheelock - INPO Records Center
R.B. McGehee
N.S. Reynolds
NRC Resident Inspectors Office
Administrator - LRPD

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SPECIAL REPORT

SR-94-003

REPORTABLE OCCURRENCE

At 0023 hours on April 4, 1994, Emergency Diesel Generator (EDG) 'A' experienced a nonvalid failure while performing a valid test. At 1654 hours that same day, EDG 'A' experienced a second nonvalid failure while troubleshooting for the failure that occurred at 0023 hours. Pursuant to Technical Specification (TS) 4.8.1.1.3, all diesel generator failures, valid or nonvalid, shall be reported in a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days.

INITIAL CONDITIONS

Plant Power: 0%

Plant Operating Mode: Mode 6; Refueling

Procedures Being Performed Specific to this Event:

OP-009-002, "Emergency Diesel Generator"

OP-903-115, "Train A Integrated Emergency Diesel Generator/Engineering Safety Features Test."

Technical Specification LCO's in Effect Specific to This Event: None

Major Equipment Out of Service Specific to this Event:

Emergency Diesel Generator 'A'

EVENT DESCRIPTION

During the Refuel 6 Outage, EDG 'A' was inoperable for maintenance from 1120 hours on March 24, 1994, to 2012 hours on April 9, 1994. During that time, EDG 'A' experienced two nonvalid failures.

The first nonvalid failure occurred during the performance of a valid test. At 2359 hours on April 3, 1994, EDG 'A' was automatically started and loaded to implement Section 7.5 of OP-903-115. Section 7.5, "Train A Safety Injection Actuation Test With Concurrent Loss of Off Site Power," is performed at least once per 18 months while shutdown to demonstrate diesel operability in accordance with TS requirements.

During the test two conditions were noted. After depressing and holding the emergency stop push button, test personnel noticed that Fuel Oil Solenoid 20F01 was not energized as expected. Also, prior to closing Safety Bus 3A3-S to 3A2 tie breaker 4KVEBKR3A 11, the diesel start light on the Control Room EDG Control Panel operating switch was not illuminated. This switch was illuminated during the initial start.

After operating at load for approximately 17 minutes, EDG 'A' tripped at 0023 hours while paralleling to offsite power. There was no annunciation at the time of the trip to indicate its cause. The trip occurred when the diesel transferred from the emergency operating mode to the test mode. This transfer is concurrent with the closure of Safety Bus 3A3-S to 3A2 tie breaker 4KVEBKR3A 11. The OP-009-002 Start Evaluation Sheet generated for the event categorized the trip as a nonvalid failure pursuant to Position 2.e.(2) of Regulatory Guide 1.108.

A definite root cause of the failure could not be determined. However, the most probable cause of the failure is that Emergency Mode Master Run Relay 4EX1 was de-energized at some point during the diesel run. This would explain de-energization of Fuel Oil Solenoid 20FO1. The 20FO1 solenoid would have de-energized immediately upon de-energization of 4EX1. Because the 4EX1 relay was not operating at the time the emergency stop push button was depressed, Unit Master Run Relays 4X1, 4X2 and 4X3 (relays not required in Emergency Mode) would have de-energized. Consequently, the Control Room EDG Start/Stop control switch start lamp and Engine Shut Down Solenoid 20SD would have de-energized. Solenoid 20SD remains by-passed in Emergency Mode by two Emergency Mode Master Run Relays -- 4EX2 and 4EX5. However, as a result of Solenoid 20SD being de-energized, EDG 'A' would have tripped when it transferred to the test mode with no indication of why the trip occurred.

Immediately after the trip, pertinent circuits were checked for loose connections. No loose connections were identified. A Work Authorization (WA) was prepared to troubleshoot Fuel Oil Solenoid 20FO1 and those components that may have caused the nonvalid failure. Troubleshooting was conducted during a simulated start (i.e., Overspeed Trip, Field Flash Breaker, and Starting Air isolated) and an Engineered Safety Features Actuation Signal (ESFAS) Test Module start. Pertinent relays and solenoid coils were monitored during that time and verified to be functioning satisfactorily. No problems were identified with the Control Room EDG Control Panel operating switch, nor with the 20FO1 and 20FO2 Fuel Oil Solenoids.

Subsequent to the ESFAS start, it was decided to continue troubleshooting by paralleling to offsite power. While attempting to parallel to offsite power, EDG 'A' tripped in the test mode at 1654 hours. The EDG Local Annunciator Panel gave indication of a reverse power trip. Also, the reverse power relay was verified tripped. The OP-009-002 Start Evaluation Sheet generated for the event categorized the trip as a nonvalid failure pursuant to Position 2.e.(7) of Regulatory Guide 1.108.

CORRECTIVE MEASURES

In addition to troubleshooting, Section 7.6 of OP-903-115, "24-Hour EDG A Run And Subsequent Loss of Offsite Power Test," was successfully completed on April 5, 1994 at approximately 2052 hours. If the conditions that caused the first nonvalid failure had existed during this test, then a similar failure would have occurred. This is due to the fact that EDG 'A' was paralleled to offsite power in the same manner as was done while implementing Section 7.5 of that procedure. Although the 4EX1 relay was operating satisfactorily during the troubleshooting, a Condition Identification has been initiated to replace this relay during the next scheduled EDG 'A' maintenance outage.

Additional troubleshooting will be conducted to investigate the cause of the reverse power trip. A Condition Identification has been written to connect recorders and monitor EDG 'A' parameters during future ESFAS Test Module starts. This corrective measure is being conducted as part of an investigation into an earlier reverse power trip. Special Report SR-94-001-00 reported an event that occurred on March 2, 1994, when EDG 'A' tripped on reverse power while paralleling to offsite power. The investigation into that event will continue and corrective measures will be taken as appropriate.

SAFETY SIGNIFICANCE

The first nonvalid failure occurred when the diesel transferred from the emergency operating mode to the test mode. This transfer is concurrent with the closure of Safety Bus 3A3-S to 3A2 tie breaker 4KVEBKR3A 11. The components that would cause this type of failure are bypassed in the emergency operating mode.

The second nonvalid failure also occurred in the test mode. Reverse power trips have no impact on the emergency mode of operation. In the emergency mode, the diesel is energizing an isolated safety bus. Reverse power trip will be locked out of the diesel shutdown circuitry for the duration of an emergency event and will not be enabled until normal offsite power is restored to the safety bus.

Neither of the nonvalid failures would have affected emergency mode operation. As a result, these events did not compromise the health and safety of the public. Furthermore, EDG 'B' was operable throughout the time EDG 'A' was unavailable.

In accordance with Regulatory Guide 1.108, the current surveillance test interval for EDG 'A' is 31 days. This test interval is in accordance with the schedule of Regulatory Position C.2.d.

SIMILAR EVENTS

No previous events similar to the first nonvalid failure were identified. However, as stated previously, Special Report SR-94-001-00 reported an event similar to the second nonvalid failure in that EDG 'A' tripped on reverse power while paralleling to offsite power. This event occurred on March 2, 1994.