



Callaway Plant

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ULNRC-2619

Gentlemen:

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CALLAWAY PLANT UNIT 1  
FACILITY OPERATING LICENSE NPF-30  
SPECIAL REPORT 92-01  
VALID DIESEL GENERATOR FAILURE DUE TO  
FAILED VOLTAGE REGULATOR RELAY

This Special Report is being submitted pursuant to Technical Specification (T/S) 4.8.1.1.3 AND 6.9.2 concerning the valid failure of Diesel Generator (D/G) 'A' due to a voltage regulator relay failing during performance of T/S 4.8.1.1.2.f.5 surveillance.

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Enclosure

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SPECIAL REPORT 92-01  
VALID DIESEL GENERATOR FAILURE DUE TO  
FAILED VOLTAGE REGULATOR RELAY

On 3/22/92, at 1540 CST, Emergency Diesel Generator (D/G) 'A' failed to reach the required voltage and frequency within the time frame described by Technical Specifications (T/S). This was a valid failure which is reported per T/S 4.8.1.1.3.

During performance of T/S 4.8.1.1.2.f.5 surveillance procedure ISP-SA-2413A, Diesel Generator and Sequencer Testing (Train A), D/G 'A' failed to reach the required voltage and frequency of 4000 +/- 320 volts and 60 +/- 1.2 Hz within 12 seconds. Upon a valid test start initiated from the Safety Injection signal, the diesel had started and obtained proper speed, but the generator had failed to produce any voltage. D/G 'A' had successfully started "and loaded" as required during performance of T/S 4.8.1.1.2.f.6 at approximately 1304 on 3/22/92.

Troubleshooting revealed that dust particles were probably trapped in the voltage regulator 41XTD relay at the time of manufacture and, as the relay operated, dislodged to the contact surface and prevented complete contact closure on the next energization of the relay. This is a backup relay that after the exciter is turned off will defeat pulses leaving the regulator by removing the control and logic power from the 3 phase pulse generator board.

On disassembly of the relay housing, the relay was found to be internally clean, with no contact arcing, discoloration or damage. A small chip was missing from the plastic of the formed coil, but was not found within the relay.

The failure was discussed with Amerace Corporation, the manufacturer of the 41XTD (Agastat) relay. They had, on occasions, seen relay contacts held open by very small dust particles, which lodge and dislodge with relay operation. Testing of the removed relay showed that small particles of dust could completely isolate or cause a high resistance in the contacts. The frequency of this type of failure is low because the relays are sealed from outside dust. Therefore this is considered an isolated occurrence.

The failed relay was replaced with a qualified relay and D/G 'A' was started successfully at 1400 on 3/23/92.

Regulatory Position C.2.e(1) of Regulatory Guide 1.10E, Revision 1, August 1977, states: "All start attempts (automatic, including those from bona fide signals, or manual) that result in a failure to start, should be considered valid tests and failures." Since D/G 'A' was unable to achieve rated speed and voltage during the start attempt, this constitutes a valid test and failure.

A starting history of D/G 'A' as of this report date is summarized as follows:

<u>No. of Valid Tests</u>	<u>No. of Failures During Valid Tests</u>	<u>No. of Failures During Invalid Tests</u>
144	6 *@	7 #

\* Special Reports 84-02, 87-10, 89-03 & 91-02, LER 87-002-00

@ Five Failures in the last 100 valid tests. Two failures in the last 20 valid tests.

# Special Reports 85-01, 85-02, 85-07, 86-01, 89-02, 89-07 & 90-01.

Surveillance tests are currently performed at least once per seven days for D/C 'A'. This is in conformance with the schedule in T/S Table 4.8-1 which requires a test interval of not more than seven days if the number of failures in the last 20 valid tests is two or more, or the number of failures in the last 100 valid tests is five or more. This accelerated testing will be maintained until seven consecutive failure free tests have been performed and the number of failures in the last 20 valid tests has been reduced to one.