

ILLINOIS POWER

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Docket No. 50-461

Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Special Report: Test Failure of Division II Diesel
Generator at Clinton Power Station (CPS)

Dear Sir:

CPS Technical Specification 4.8.1.1.3 requires all diesel generator failures, valid or non-valid, be reported to the Nuclear Regulatory Commission (NRC) pursuant to Technical Specification 6.9.2, SPECIAL REPORTS, within thirty days. Due to the valid failure of the Division II Diesel Generator (DGLB) during surveillance testing on January 6, 1991, this SPECIAL REPORT is being submitted in accordance with the CPS Technical Specifications to provide the information required by Regulatory Guide 1.108, Revision 1, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants", Regulatory Position C.3.b.

Description of Event

At 0803 hours, on January 6, 1991, a start of DGLB was initiated in accordance with CPS Procedure 9080.01, "Diesel Generator 1A (1B) Operability - Manual". This test was being performed in accordance with Technical Specification 4.8.1.1.2.a. This Technical Specification requires that the diesel generator reach its frequency (speed) and voltage within twelve seconds after the initiation of a start signal. During this test it took 14.1 seconds for DGLB to reach the required speed of 60 ± 1.2 Hertz (Hz). Voltage met the required 4160 ± 420 volts within the required twelve seconds.

The initial assessment of the failure indicated a problem existed in the DGLB speed control electronics. Troubleshooting revealed that the A-3 relay tachometer (speed switch) experienced a malfunction. The A-3 relay directly feeds the engagement of the air start motors, main control room indication, and the diesel generator engine tachometer.

The A-3 relay failed due to a broken wire on one of the silicon control rectifiers. This resulted in an increased A-3 relay response time which delayed the response of all diesel generator control circuitry. Therefore, although adequate speed was reached, it was not reached within the time required by the Technical Specifications. DGLB did meet the other acceptance criteria of surveillance 9080.01.

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Corrective Actions

The A-3 relay was replaced and surveillance 9080.01 was completed with satisfactory results at 0501 hours on January 7, 1991. Since the plant was in Mode 5 (REFUELING), DG1B was not required to be operable. The nature of the A-3 relay failure, the broken wire inside the relay, was considered to be applicable to the Division I Diesel Generator (DG1A); however, since the DG1A A-3 relay was replaced approximately one year ago, it is not considered susceptible to this failure. The Division III Diesel Generator control circuitry was supplied by a different vendor than DG1A and DG1B and is not susceptible to this type of failure.

The most probable cause of the broken wire was aging of the A-3 relay combined with the stress placed on the wire during bench testing of the relay. This relay had been removed and calibrated in December 1990, to resolve problems experienced with the DG1B air start solenoid valves. On January 6, 1991 following reinstallation of the A-3 relay, the A-3 relay and DG1B were verified to function by satisfactory performance of procedure 3506.01, "Diesel Generator and Support Systems." The next start of DG1B was on January 6, 1991 at which time DG1B failed to reach the required speed within twelve seconds.

A preventive maintenance task (PM) will be issued to remove, inspect, and bench test the A-3 relay every two years to ensure the relay is functioning correctly and that wires and connections are intact. This PM will be initiated by May 31, 1991.

Additionally, a caution has been added to the vendor manual, the document governing bench testing of the A-3 relay, to ensure the electricians are aware of the susceptibility of the wires internal to the relay to be stressed and to break.

Test Intervals

A total of seventy-two tests, in accordance with Regulatory Guide 1.108 had been performed on DG1B as of January 6, 1991. The January 6, 1991 was the fifth failure in the seventy-two tests performed on DG1B and the second in the last twenty. Technical Specification Table 4.8.1.1.2-1, requires the testing frequency to be increased from at least once per 31 days to at least once per 7 days when the number of failures is greater than or equal to two in the last twenty, or five in the last one hundred tests. DG1B was therefore tested on January 7, 14, and 21, 1991.

On January 25, 1991, the NRC provided CPS with its evaluation of the DG failure classifications assigned as a result of finding inadequate shutdown service water (SX) flow to DG1A and DG1B on May 15, 1990. The NRC determined that the DG1B failure of May 15, 1990, was not a valid failure since DG1B was not called upon to start. This evaluation reduced the total number of tests to seventy-one as of January 6, 1991, and the valid number of failures to four in seventy-one and one in the last twenty. This decreased the required testing frequency to at least once per 31 days.

This letter satisfies the requirement of CPS Technical Specifications 4.8.1.1.3 and 5.9.2 for issuing a SPECIAL REPORT for diesel generator failures.

Sincerely yours,



F. A. Spangenberg, III
Manager, Licensing and Safety

TSA/alh

cc: NRC Clinton Licensing Project Manager
NRC Resident Office
NRC Region III, Regional Administrator
Illinois Department of Nuclear Safety