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ENCLOSURE 1

Emergency Diesel Generator Start Failure

1. Emergency Diesel Generator Involved:

Emergency Diesel Generator (EDG) 14

2. Identification of Failure:

Failure Date: October 31, 1986, 1935 hours

Description of Event:

The EDG 14 trip which occurred on October 31, 1986 was initiated by an automatic actuation of the EDG "field failure" trip feature. Since the "field failure" trip feature is not active in the emergency operating mode for the EDG, the start failure which occurred during this event is an "invalid test" based on the test evaluation criteria described in position C.2.e.(2) of Regulatory Guide 1.108.

The cumulative number of start failures incurred during "invalid tests" to date for EDG 14 since issuance of the Fermi 2 Facility Operating License (OL) increased from two (2) to three (3) as a result of this event. The cumulative number of start failures incurred during valid tests for EDG 14 since issuance of the OL remains unchanged at zero (0). Prior to this start failure there had been twenty-six (26) valid test test starts since issuance of the OL.

3. Cause of Failure:

At the time of this event, EDG 14 had been successfully started, synchronized to the transmission grid, and loaded and operating at 1800 KW. The EDG had been started to allow the performance of required Technical Specification monthly surveillance testing activities. These surveillance testing activities did not require or include timed starting or loading of the EDG.

Startup testing and setting of the main generator Automatic Voltage Regulators (AVRs) was being performed during approximately the same time period as was the surveillance testing of the EDG. The AVRs control main generator output voltage by providing dynamic control of main generator winding excitation.

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At the time of the EDG trip troubleshooting was being performed on the manual followup channel for main generator AVR "B". The troubleshooting activities consisted of monitoring and recording operational parameters (voltage readings) inside the AVR instrument cabinet. The troubleshooting was being performed to determine the cause of main generator output voltage regulation problems which had been observed during startup testing.

When the EDG trip occurred a high voltage spike was noted on the electrical bus associated with main generator output. Coincident with the initiation of the EDG trip the AVR instrument cabinet door had been closed by personnel who were performing the AVR troubleshooting. It is believed that the voltage spike was initiated when the cabinet door was closed, and was the result of test leads being reoriented when the door was shut.

EDG 14 was aligned to the electrical bus which exhibited the voltage spike when the spike occurred. As a result, the bus voltage spike was sensed by the voltage regulator for EDG 14 as a high EDG output voltage. In response to the sensed high electrical bus voltage, the excitation current for the EDG was automatically reduced by the EDG voltage regulator in an attempt to lower the voltage at the EDG output terminals.

During the bus voltage spike transient the EDG excitation current was reduced below the EDG "field failure" trip setpoint and an automatic trip of EDG 14 was initiated. A "field failure" trip is initiated when a condition indicative of underexcitation of the EDG generator windings is sensed. The trip was received after the EDG had been running for approximately fifteen (15) minutes.

4. Corrective Measures Taken:

The personnel involved in this event have been counseled regarding their actions during this event and the need to exercise caution when working in cabinets which enclose temporary cable routings.

5. Length of Time EDG Unit Unavailable:

As a result of this event EDG 14 was unavailable for approximately 90 minutes after the trip.

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6. Current Surveillance Test Interval:

The current test interval for EDG 14 remains unchanged at an interval of at least once per each thirty one (31) days.

7. Verification of Conformance of Test Interval:

The EDG 14 start failure of October 31, 1986 is an example of an "invalid test" based on the evaluation criteria listed in position C.2.e of Regulatory Guide 1.108. As a result, this event does not increase the number of failures incurred during the previous 100 valid tests for EDG 14 or affect the current surveillance testing interval.

The current testing interval for EDG 14 of at least once per each thirty one (31) days is in accordance with position C.2.d of Regulatory Guide 1.108, and the requirements of Fermi 2 Technical Specification Table 4.8.1.1.2-1.