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Nuclear Generation

November 22, 1989
NRC-89-0248

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

Reference: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Emergency Diesel Generator Start Failure

Please find attached our report on one start failure of Emergency Diesel Generator (EDG) 13 which occurred on October 23, 1989. This report is submitted to you in accordance with Fermi 2 Technical Specifications 4.8.1.1.3 and 6.9.2.

If you have any questions regarding this report, please contact Joe Pendergast at (313) 586-1682.

Sincerely,

Attachment

cc: A. B. Davis
R. W. DeFayette
T. R. Quay
W. G. Rogers
Region III

IE22
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Attachment

Emergency Diesel Generator Start Failure

Emergency Diesel Generator Involved:

Emergency Diesel Generator (EDG) 13

Identification of Failure:

Failure Date: October 23, 1989, 0156 hours

Description of Event:

This is the sixth start failure of EDG 13 that occurred during what is considered an "invalid test" since issuance of the Fermi 2 operating license. At the time of this start failure, there had been 170 valid test starts since the operating license was issued. The October 23, 1989, start failure is considered a failure in an "invalid test" under section c.2.e.(2) of NRC Regulatory Guide 1.108 because the spurious generator field failure trip signal is bypassed during emergency EDG starts. The number of start failures incurred during "valid tests" for EDG 13 since issuance of the operating license remains unchanged at one.

Cause of Failure:

A Fast Start and Load Surveillance Test (24.307.16) was performed on EDG 13 on October 23, 1989. EDG 13 received a manual start per the surveillance and accelerated to nominal frequency (60Hz/900rpm) and voltage (4160v) within the required 10 seconds. However, EDG 13 tripped on a generator field failure trip signal 33 seconds after initiation of the manual start. The EDG had not yet been manually loaded.

Just prior to the trip, the operator had verified EDG 13 generator DC field current to be 38 amps, which is normal for an unloaded EDG. The trip setpoint for the generator field failure trip (40) relay is less than or equal to 30 amps DC. The field failure trip is a non-essential trip signal and is bypassed during emergency starts.

Investigation revealed a contact on the "40" relay was slightly pitted and had stuck in the closed position. This contact normally opens when the EDG is running and generator field current is greater than 30 amps DC.

Upon an EDG start, the generator field failure trip signal is delayed for approximately 33 seconds by a time delay relay. This relay allows the generator exciter time to develop sufficient field current prior to enabling the generator field failure trip signal. During the October 23, 1989 start of EDG 13, the "40" relay contact failed to open after 33 seconds and resulted in a trip even though actual field current was normal at 38 amps and well above the trip setpoint. Post-trip testing of the "40" relay verified its trip setpoints were still within acceptance criteria.

Corrective Measures Taken:

The contact of the "40" relay was burnished. EDG 13 was subsequently restarted and successfully completed its surveillance test. Preventive maintenance on the "40" relays will be performed on a periodic basis.

Length of Time EDG Unit Unavailable:

EDG 13 was out of service for approximately 36 hours due to the October 23, 1989 trip.

Current Surveillance Test Interval:

The current surveillance test interval remains unchanged at once per 31 days.

Verification of Conformance of Test Interval:

This surveillance test interval is in conformance with Regulatory Position c.2.d of U.S. Regulatory Guide 1.108 and in conformance with Fermi 2 Technical Specifications.