

Detroit
Edison

William S. Orser
Vice President
Nuclear Operations

Fermi 2
6400 North Dixie Highway
Newport, Michigan 48166
(313) 586-5300



Nuclear
Operations

May 20, 1988
NRC-88-0124

U. S. Nuclear Regulatory Commission
Attention: 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 April 20,
1988. 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
Patricia Anthony at (313) 586-1617.

Sincerely,

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

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PDR ADOCK 05000341
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ENCLOSURE 1

Emergency Diesel Generator Start Failure

1. Emergency Diesel Generator Involved:

Emergency Diesel Generator (EDG) 13

2. Identification of Failure:

Failure Date: April 20, 1988, 0227 hours

Description of Event:

This is the fifth 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 133 valid test starts since the operating license was issued. The April 20, 1988 start failure is considered a failure in an "invalid test" under section c.2.e.(2) of NRC Regulatory Guide 1.108 because the Woodward governor actuator load limit knob is believed to have been misadjusted by an unauthorized person. The number of start failures incurred during "valid tests" for EDG 13 since issuance of the operating license remains unchanged at one.

3. Cause of Failure:

EDG 13 failed to reach rated frequency (60.0 HZ/900 RPM) and voltage (4160 V) within the required 10 seconds during an 18 month ECCS Start and Load Rejection Surveillance Test (24.307.12) on April 20, 1988. The actual start time to rated frequency and voltage was 12.5 seconds. In addition, EDG 13 could not be loaded to greater than 1500 kilowatts while attempting to load the diesel to 2500 kilowatts as required by the surveillance.

Immediate investigation by the operator revealed the load limit knob on the Woodward governor actuator was set to only 14/32 of full scale instead of the required full maximum setting. This reduced setting limited the maximum diesel fuel delivery rate, thus limiting both acceleration and maximum load.

The EDG was unloaded and the load limit knob adjusted to its maximum setting. EDG 13 was then successfully loaded to 2500 kilowatts as required by the surveillance.

The cause of the improper setting of the EDG 13 Woodward governor actuator load limit knob appears to be the result of an unauthorized person resetting the knob. Based on a thorough investigation, all other possibilities were ruled out. The suspected unauthorized resetting would have occurred sometime between March 25, 1988 (date of last engine run which included loading EDG 13 to 2500 kilowatts) and April 20, 1988. During that period, the computerized security zone area access printout indicated 292 persons accessed Division 2 of the Residual Heat Removal (RHR) complex building which includes the area of EDG 13. Anyone of these individual could have reset the knob.

A summary of the investigation follows:

1. The other three EDG's were checked for similar improper settings and none were found.
2. The last engine run on EDG 13 was a surveillance test performed on March 25, 1988. This was slow start, per the surveillance, and the EDG was successfully loaded to 2500 kilowatts. This indicated knob was properly adjusted during this surveillance. EDG 13 was considered operable and in standby during the period between March 25, 1988 and April 20, 1988. Therefore, the inappropriate adjustment must have occurred during this period.
3. The "Out of Spec Log" and "Abnormal Lineup Sheets" were checked and indicated no major maintenance was performed since the last successful surveillance on March 25, 1988.
4. The load limit knob adjustment is rather stiff and thus casual contact or vibration could not have caused the knob to move.
5. The Woodward governor actuator load limit knob adjustment is neither set nor verified in any plant procedures.
6. Normally, the load limit knob is always set to its maximum fuel setting. The only time this knob would ever be adjusted is during special testing under vendor direction. The vendor verified that he did not adjust EDG 13 load limit knob between March 25, 1988 and April 20, 1988. Based on the above investigation, it is concluded the EDG 13 load limit knob misadjustment was the result of unauthorized adjustment.

4. Corrective Measures Taken:

Unsuccessful portions of surveillance 24.307.12 were performed successfully following readjustment of the load limit knob to the maximum fuel setting.

Operations Standing Order 88-09 was issued on April 21, 1988. It requires the operators to verify proper normal settings once per day for all three governor control knobs (speed drop, mechanical governor speed adjust, and load limit fuel). This is done for EDG's 11, 12, 13 and 14 as part of the Operator Routine Round Sheet.

Nameplates, which include the specific normal knob settings for each of the knobs on the Woodward governor, were installed on the governor of each EDG on April 21, 1988. These will aid the operators in verifying of proper governor settings. Standing Order 88-09 will remain in effect until at least the long term corrective action (Limiting access to the RHR complex described below) is in place.

Access to the RHR complex will be restricted to reduce the total number of persons entering to building which houses the EDG's and other safety related equipment. This will be accomplished via the security keycard zone access computer system. This will help ensure only persons with valid reasons will be entering the RHR complex. During the period of March 25, 1988 to April 20, 1988, the total number of 292 persons entering Division 2 of the RHR complex appears to be high.

5. Length of Time EDG Unit Unavailable:

The unauthorized resetting would have occurred sometime between March 25 and April 20 of 1988. After the start failure, the EDG was restored to operable status in approximately one half hour.

6. Current Surveillance Test Interval:

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

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7. 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.