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January 31, 1986

NUCLEAR LICENSING & SAFETY DEPARTMENT

U. S. Nuclear Regulatory Commission
Region II
101 Marietta St., N. W., Suite 2900
Atlanta, Georgia 30323

Attention: Dr. J. Nelson Grace, Regional Administrator

Dear Dr. Grace:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Special Report 85-016/1
Diesel Generator 11 Failure
AECM-86/0034

On November 6, 1985 at approximately 1500, Diesel Generator 11 was manually started for retest following preventive maintenance. After a successful start, the engine surged to over 600 RPM before it could be shutdown. The diesel generator was declared inoperable. Investigations and inspections were conducted to determine the cause and affect of the event.

It is concluded from the investigations that the overspeed was caused by insufficient oil in the mechanical governor. A governor coupling had been replaced and the governor oil changed just prior to the event.

The engine was dismantled to determine the extent of damage caused by the overspeed event. Cracking, heat marks, fretting, or scoring were exhibited on some components. The components were repaired, replaced or accepted as found. The details of the nonconformances and the disposition of each item are documented on plant Material Nonconformance Reports.

Insufficient detail in the governor oil change procedure for the filling and venting of the governor contributed to the low oil volume in the mechanical governor. Oil had been added to the proper level in accordance with the procedure. However, air remained in the system because the procedure did not adequately address the filling of the oil lines and cooler. The oil level dropped in the governor actuator during the start resulting in its improper operation. The preventive Maintenance Instruction for the periodic governor oil change has been revised to provide detailed instructions on the filling and venting process, insuring that oil is added to the governor as necessary to keep the oil level correct. The System Operating Instruction (SOI) was also revised to provide verification of proper oil level prior to manual starts.

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Two factors which contributed to the extent of the overspeed were the slow response of the overspeed pneumatic trip system (relative to the rapid engine acceleration) and the Mechanical Governor Speed Control being set at its normal setting of 470 RPM rather than a 300-350 RPM setting for unexcited starts.

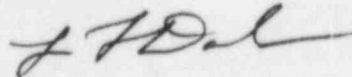
Testing of the pneumatic trip system showed that the times from the initiation of a trip signal to the completed response of pneumatic shutdown devices were approximately 4 to 6 seconds. The manufacturer, using a test stand, determined the overspeed trip setpoint to be 537 RPM. The SOI has been revised by a Temporary Change Notice to require maintenance personnel to perform an overspeed trip device timing within 24 hours prior to a manual start. A revision to the SOI is being made to relax this requirement when the start is for an operability demonstration that is time restrained by a Technical Specification action statement. Also the SOI was revised to require an operator to be stationed at the engine stop button to shut the diesel generator down in case of overspeed or other problem during the start.

The special retest instruction provided, following the governor oil change, did not reduce the normal engine idle speed setting from 470 RPM. This may have contributed to the extent of the overspeed. The overall changes to the SOI and oil change procedure provide better correlation between one another to ensure a proper governor oil level and to ensure that the speed and load limit settings are reduced prior to an unexcited start. Additional administrative controls will be revised to enhance the approval process of post maintenance tests for major rotating equipment.

The failure is considered an invalid failure pursuant to Position C.2.e(2) of Regulatory Guide 1.108. The unsuccessful completion of the start and load attempt is attributed to operating error (operation with insufficient oil in the mechanical governor). The current test interval remains at once per 31 days in conformance with the schedule of Regulatory Position C.2.d. Diesel Generator 11 was satisfactorily returned to service on December 6, 1985.

This Special Report is submitted as an update to AECM-85/0394 dated December 6, 1985.

Yours truly,



L. F. Dale
Director

JRM/SHH:bms

cc: (See Next Page)

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