



ENTERGY

Entergy Operations, Inc.
P.O. Box 756
Patt. Gibson, MS 39160
Tel 601 437 6406

November 13, 1992

W. T. Cottle
Vice President
Operations
Grand Gulf Nuclear Station

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-39
Special Report 92-008
Valid Failure of Emergency Diesel Generator 11 Due
to Water in Cylinder

GNRO-92/00139

Gentlemen:

In December 1986, the Commission issued Amendment 26 to the GGNS Operating License. This amendment added maintenance and surveillance requirements for the TDI EDGs. The surveillance requirement specified for the cylinder heads was that an air roll be performed at specified times to ensure water leakage into a cylinder would be detected and the appropriate action taken to ensure diesel reliability. This requirement is implemented through approved plant procedures.

On October 14, 1992, Operations personnel performed a venting procedure (air roll) on Emergency Diesel Generator (EDG) 11 in accordance with Section 4.2.2.a of System Operating Instruction 04-1-01-P75-1.

During the air roll of EDG 11, plant personnel observed water coming from the Number 2 Right Bank cylinder stopcock. The air roll was performed twice more with the same results.

A work order was generated to replace the head and retest EDG 11. The cracked head was replaced and the diesel was retested satisfactorily.

Another work order was generated to perform non-destructive examination inspections on the cylinder head to determine if the head was actually cracked. The results of the examination revealed a crack (approximately three inches in length) in the top left exhaust port of the Number 2 Right Bank cylinder head.

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The cause of the crack is believed to be manufacturing defects in the head. Based on operating experience of cylinder heads cast before October 1978 for the Transamerica Delaval, Inc. Enterprise (TDI) inline and V-type R-4 series engines, plant personnel were aware that heads of this type, presently installed on EDG 11 and 12, were not stress-relieved and are susceptible to fatigue crack growth in thin sections and/or from fabrication-induced defects. This information was provided in a report by Pacific Northwest Laboratory in December 1985.

The cylinder head that was cracked on EDG 11 was manufactured January 1975; therefore it is categorized as a Group I head. Based on failure of heads for the TDI R-4 engines, TDI made changes in manufacturing procedures and in quality control, as well as minor design changes. Those cast prior to October 1978 are Group I; those cast between October 1978 and September 1980 are Group II; and those cast after September 1980 are Group III.

Failure history of TDI R-4 series engines indicates that Groups I and II heads were subject to core shift, inadequate control of solidification, and inadequate control of the stellite valve seat weld deposition process. The Group III heads are less prone to manufacturing defects. GGNS presently has some Group III heads installed, however Group I heads are still in use.

During the air roll, a condition (e.g., water in a cylinder) was identified that could have resulted in the failure of the diesel generator unit during test or during response to a bona fide signal. The amount of water discovered in the cylinder would not have caused a failure. However, if the leak had gone undetected, a sufficient amount of water could have accumulated in the cylinder to cause failure of the EDG.

Therefore this occurrence is considered a valid failure of the EDG unit. This was the first valid failure in the last 20 valid tests and the fifth valid failure in the last 100 valid tests. In accordance with Technical Specification Table 4.8.1.1.2-1, the surveillance frequency for EDG 11 was increased to once per 7 days.

Yours truly,

WTC/RR/

WTC/RR/

cc:

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cc:

Mr. R. H. Bernhard
Mr. D. C. Hintz
Mr. R. B. McGehee
Mr. N. S. Reynolds
Mr. H. L. Thomas

Mr. Stewart D. Ebner
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 2900
Atlanta, Georgia 30323

Mr. P. W. O'Connor (w/2)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 13H3
Washington, D.C. 20555