



MISSISSIPPI POWER & LIGHT COMPANY

Helping Build Mississippi

P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

JAMES P. McGAUGHY, JR.
ASSISTANT VICE PRESIDENT

November 8, 1982

Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W.
Suite 3100
Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
License No. NPF-13
Docket Nos. 50-416/417
File 0260/15525/15526
PRD-82/14, Interim Report No. 4,
Sheared Bolts on Diesel
Generator Rear Crankcase Cover
AECM-82/521

References: AECM-82/176, 4/21/82
AECM-82/288, 6/25/82
AECM-82/380, 9/7/82

On March 22, 1982, Mississippi Power & Light Company notified Mr. R. Butcher, of your office, of a Potentially Reportable Deficiency (PRD) at the Grand Gulf Nuclear Station (GGNS) construction site. The deficiency concerns sheared bolts on the rear crankcase cover of the Delaval diesel generators.

MP&L has evaluated this deficiency and determined that it is reportable under the provisions of 10CFR50.55(e) and 10CFR21 for the Unit 1, and 10CFR50.55(e) for Unit 2.

Investigations are still in progress to determine cause of the deficiency and corrective actions.

Our attached Interim Report includes details of the investigation conducted to date. This report was originally due on October 30, 1982, but an extension was granted on that day by Mr. D. Verelli. We expect to submit a Final Report by January 31, 1983.

Yours truly,

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ATTACHMENT

cc: See page 2

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Mr. J. P. O'Reilly
NRC

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cc: Mr. N. L. Stampley
Mr. R. B. McGehee
Mr. T. B. Conner

Mr. Richard C. DeYoung, Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. G. B. Taylor
South Miss. Electric Power Association
P. O. Box 1589
Hattiesburg, MS 39401

INTERIM REPORT NO. 4 FOR PRD-82/14

1. Name and address of the individual informing the commission:

J. P. McGaughy, Jr.
Assistant Vice-President, Nuclear Production
P.O. Box 1640
Jackson, Mississippi 39205

2. Identification of the facility which contains a deficiency:

Grand Gulf Nuclear Station (GGNS) Unit 1
Port Gibson, Mississippi 39150

NOTE: 10CFR21 is not applicable for Unit 2 as the diesel generators have not been turned over to MP&L. The deficiency in the Unit 2 generators is reportable under 10CFR50.55(e).

3. Identification of the firm supplying the basic component which contains a deficiency:

The Diesel Generators were manufactured by Transamerica Delaval, Inc., Oakland, California and supplied to Grand Gulf by Bechtel Power Corporation, Gaithersburg, Maryland.

4. Nature of the deficiency and the safety hazard which could be created by such a deficiency:

A. Description of the Deficiency

During the performance of a 24 hour run test, the Unit 1, Division II diesel generator manufactured by Transamerica Delaval, Inc. tripped on a "Generator Differential" which was accompanied by an observed electrical arcing flash inside the generator. In a subsequent inspection of the generator, it was found that the stator insulation had been damaged and that a 15/16" bolt head from a 5/8" bolt was embedded in the stator. The degraded stator insulation resulted in a phase to phase short in the stator that damaged the generator. It was determined that the bolt head was from a bolt on the diesel's rear crankcase cover. The bolt had sheared off and entered the generator through the air gap on the end of the generator.

An analyses of 42 bolts was performed and a review of the results produced the following conclusion: The failure mode was due to a low-stress fatigue front expanding from an initial small crack. The initial crack appeared to have been initiated by overtorquing or undertorquing the capscrew. The capscrew was then subjected to low level vibrational fatigue stresses from the crankcase cover which caused the expansion of the microcracks across the section and the subsequent failure of the bolt.

All rear crankcase cover bolts from the Unit 1, Division I and II diesels were replaced with new bolts. However, while performing maintenance on the Unit 1, Division II generator it was discovered that these new bolts had also undergone shearing. An additional investigation is now underway.

It is now believed that the cause of this failure was fatigue stresses that were transmitted to the capscrew from the reciprocating motion of the diesel engine. These fatigue stresses induced a crack in the capscrew material, which progressed through the capscrew shank.

B. Analysis of Safety Implications

Failure of the rear crankcase cover bolts could result in the nonavailability of the diesel generator. The diesel generators supply power to systems that are required to shutdown and cool the reactor and to maintain the reactor in this condition during a loss of off-site power.

5. The date on which the information of such deficiency was obtained.

Mississippi Power and Light received information of the deficiency on March 15, 1982. We reported this as a potentially reportable deficiency to Mr. R. Butcher, of your office, on March 22, 1982. An evaluation for Part 21 applicability has been completed for Unit 1 and the MP&L "Responsible Officer," Mr. J. P. McGaughy, Jr., has been notified.

6. In the case of the basic component the number and location of all such components.

We do not have knowledge of the location of other diesel generators besides the four (two for each Unit) located at Grand Gulf.

7. The corrective action which has been taken, the name of the individual responsible for the action, and the length of time that has been taken to complete the action.

A. Corrective Actions Taken

1. The Unit 1, Division II generator was replaced with a generator from Unit 2.
2. The Unit 1, Division I and II, diesels' rear crankcase cover bolts were replaced with new SAE Grade 5 bolts from stock.
3. A design change (DCP-82/0039) has been initiated to install protective caging on the generator air gaps.
4. All bolts removed from the Unit 1, Divisions I and II, diesels' rear crankcase covers were sent to an independent laboratory for failure analysis.

5. The damaged generator has been dispositioned to be returned to the vendor.
6. Our Architect/Engineer has been notified to initiate the appropriate corrective actions for the Unit 2 diesel generators.
7. An additional investigation is presently in progress to determine the acceptability of the bolt material and/or the vendor torquing requirements.

B. Responsible Individual

Unit 1	Unit 2
C. K. McCoy	T. H. Cloninger
Nuclear Plant Manager	Unit 2 Project Manager
Mississippi Power & Light Co.	Mississippi Power & Light Co.

C. Length of Time to Complete Actions

1. All Unit 1 bolts in Division I and Division II Generators have been replaced.
 2. An installation date for the protective caging for the Unit 1 Division I and II diesel generators will be held in abeyance pending the results of the investigation noted in paragraph 4.A above.
 3. The analysis presently in progress is expected to be completed by December 31, 1982. Additional necessary corrective actions will be formulated upon completion of the analysis.
 4. Corrective actions for Unit 2 will be completed by our Architect/Engineer prior to turnover to MP&L.
8. Any advice related to the deficiency that has been, is being, or will be given to purchasers or licensees:

As the deficiency did not originate with MP&L, we have no advice to offer.