

LOUISIANA POWER & LIGHT COMPANY

WATERFORD SES UNIT NO. 3

Final Report of
Significant Construction Deficiency No. 6

Emergency Diesel Generators-Defective Shafts & Springs

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September 18, 1980

FINAL REPORT
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 6
EMERGENCY DIESEL GENERATORS-DEFECTIVE SHAFTS & SPRINGS

INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e) (3). It describes a deficiency in the emergency diesel generators supplied by Cooper-Bessemer Company for LP&L's Waterford Steam Electric Station Unit No. 3.

DESCRIPTION

On July 25, 1978, Cooper-Bessemer Company pursuant to 10CFR21 notified the USNRC - Office of Inspection and Enforcement, Washington, D. C., of defective shafts and springs in the Emergency Diesel Generators supplied for LP&L's Waterford SES Unit No. 3 at Taft, Louisiana.

A. Shafts

The defect exists in the two shafts which drive the engine speed control governor and the engine overspeed shutdown governor on each engine. The splined driven end of the shafts was manufactured two inches longer than required by design specification. The additional length causes the shaft spline to misalign with the splined drive bushing, resulting in marginal engagement of the splined surfaces. This defect is considered to be reportable and is described in Attachment A (Cooper-Bessemer Co. letter to NRC dated July 25, 1978).

B. Springs

The defect exists in a spring which operates the overspeed shutdown butterfly valve on the engine turbocharger air inlet connection. The spring is plated with electrolytically deposited cadmium to prevent corrosion. Several identical springs have recently failed on units still in the process of manufacture at C.E.S. The cause of failure has been determined to be cracks in the base metal caused by the electrolytic plating process. This defect is considered to be non-reportable and is described in Attachment B (Cooper Energy Services letter to NRC dated July 25, 1978).

SAFETY IMPLICATIONS

A. Shafts

If the units were to fail during operations, the following consequences would result:

Overspeed Shutdown Governor shaft failure, only - The unit would continue to operate normally, but would lose overspeed protection.

Speed Control Governor shaft failure, only - The unit speed would rapidly proceed to overspeed, at which point the Overspeed Governor would effect a shutdown of the unit.

Simultaneous failure of both shafts - The unit speed would rapidly increase out of control until a mechanical failure occurred, placing the unit out of service.

B. Springs

If the units were operational and the spring were to fail, one of the two overspeed protection devices provided on each engine would fail to perform. However, the other overspeed protection device, a fuel shut-off mechanism activated by a mechanically driven speed governor, would not be affected by the spring failure and would provide independently effective engine overspeed protection.

CORRECTIVE ACTION

Cooper Energy Services has fabricated new governor drive shafts, thus correcting the deficiency in the length of the shaft.

The defective spring has been remanufactured from a material that will not crack as a result of the electrolytic plating process.

Replacement of the new shafts and springs was accomplished by Gulf Engineering Company, Inc., under the supervision of a Cooper-Bessemer representative. The work was completed during the week ending September 19, 1980, and is documented in Gulf Engineering Traveler Nos. P5-233 and P5-229.