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United States Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Region II - Suite 3100  
101 Marietta Street  
Atlanta, Georgia 30303

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Reference: Vogtle Electric Generating Plant - Units 1 and 2  
50-424; 50-425; DeLaval Diesel Generator -  
Piston Skirt Cracking

Attention: Mr. James P. O'Reilly

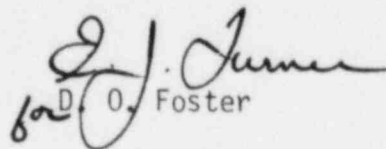
Gentlemen:

Georgia Power Company has concluded its evaluation concerning the above referenced subject and has determined a significant deficiency and a substantial safety hazard could exist. However, since Transamerica Delaval has already reported this defect to the NRC in their letter of October 28, 1982, Georgia Power Company is reporting this concern as a significant deficiency.

Enclosed is our evaluation concerning the piston skirts.

This report contains no proprietary information and may be placed in the NRC Public Document Room upon receipt.

Yours truly,

  
D. O. Foster

CWH/DOF/tlp  
Enclosure

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EVALUATION FOR A SUBSTANTIAL SAFETY HAZARD  
EVALUATION FOR A SIGNIFICANT DEFICIENCY

Transamerica Delaval Diesel Generators  
Piston Skirt Cracking

Initial Report:

On December 23, 1982, Mr. E. D. Groover, Georgia Power Company, QA site supervisor reported a potential deficiency to Mr. Virgil Brownlee of the USNRC Region II concerning the potential problem of piston skirt cracking in Delaval diesel generators.

Background:

On October 28, 1982, Transamerica Delaval notified the Nuclear Regulatory Commission of a potential defect in components furnished for DSRV or DSR Standby Diesel Generators. The defect concerned engine piston skirt castings which could result in engine nonavailability. The potential defect concerns the possibility of existence of residual stresses in the piston skirts manufactured between December 1978 and October 1981. The residual stresses result from the method of heat treating the piston skirts. This residual stress, in combination with operating stress, could cause cracking of the piston skirt during operation which, could result in engine failure if undetected.

The Vogtle Project architect/engineer was notified of this potential defect by Transamerica Delaval in a letter dated November 18, 1982. Georgia Power Company received notification from the architect/engineer in December 1982.

Analysis of Safety Implications:

The standby diesel generators provide an emergency source of onsite power to the safety-related equipment to ensure its continued operation following an accident occurring coincident with loss of offsite power. Because the design and fabrication of the piston skirts for the diesel generators furnished for the Vogtle Project is essentially the same, it is reasonable to postulate a common mode failure of a piston skirt on both engines. This would cause the failure of both engines, resulting in a loss of power to both trains of the emergency core cooling system (ECCS), and most of the emergency safety features (ESF) equipment. Since the piston skirts furnished for Vogtle can be assumed to contain high residual stresses due to the method of heat treatment, it is reasonable to assume a failure of the emergency onsite power supply and the consequential failure of the ECCS and ESF systems.

Review of Part 10 CFR 50.55(e) and Part 21:

The holder of a construction permit is to notify the Commission of each deficiency found in design and construction which, were it to have

Evaluation for a Substantial Safety Hazard  
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Delaval Diesel Generator-Piston Skirt Castings

remained uncorrected, could have affected adversely the safety of operations of the nuclear power plant at any time throughout the expected lifetime of the plant. For this deficiency, failure of the diesel generators results in the unavailability of the ECCS and ESF systems, which could affect safety of operations.

Georgia Power Company has determined that this concern does not represent a significant breakdown in any portion of the quality assurance program at Transamerica Delaval. This concern does represent a significant deviation from performance specifications that will require an extensive repair to establish the adequacy of the diesel generators to perform their intended safety function.

Guidance supplied by the NRC for Part 10 CFR 21 states that "a deviation that causes or could cause a failure in a redundant basic component is a reportable defect under Part 10 CFR 21 since the loss of safety function of a basic component is considered a major reduction in the degree of protection provided to the public health and safety. It is also possible that the defect exists in the redundant basic component which could result in a loss of safety function. The existence of a defective basic component, considering a single failure of its counterpart redundant basic component, could result in a loss of safety function." Based upon this guidance from NUREG-0302, Revision 1, page 21.3(k).2, it has been concluded a defect does exist and that this concern is reportable under Part 10 CFR 21.

Conclusion:

Georgia Power Company has concluded that the improper heat treatment of the piston skirt castings represents a reportable deficiency and substantial safety hazard. Since the NRC has been adequately informed of the existence of the defect by a previous letter from Transamerica Delaval, Georgia Power Company is reporting this concern as a significant deficiency. NRC guidance indicates that duplicate reporting is not required if the Commission has been adequately informed and if the required information is provided should a notification be required.

Corrective Action:

In their report to the Nuclear Regulatory Commission, Transamerica Delaval describes the following corrective action:

"After the engines have been installed on their foundations and flywheels installed so the engine can be barred over, remove all pistons from the engines and return them to the Transamerica Delaval plant in Oakland, California. Transamerica Delaval will then inspect, stress relieve and return the pistons for reinstallation. Any piston skirts found defective will be replaced."

Because of the magnitude of the effort associated with this corrective action, Georgia Power Company is investigating with Transamerica Delaval, Inc. a number of questions regarding the logistics of the piston replace-

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ment. Also, based upon the current construction schedule, the diesel generator building will not be completed until 1985. Since the engines must be installed on their foundations and barred over, Georgia Power Company cannot begin corrective action until 1985, and currently estimates corrective action will be completed by December 1986.

Mr. W. R. Evans, Georgia Power Company's mechanical Project Section Supervisor, is responsible for the corrective action.