



Georgia Power

the southern electric system

D. O. Foster
Vice President and Project
General Manager
Vogtle Project

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August 10, 1984

United States Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30302

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Reference: Vogtle Electric Generating Plant-Units 1 and 2, 50-424, 50-425;
HVAC Interior Duct Lining; also GN-378 dated 6/28/84.

Attention: Mr. James P. O'Reilly

Gentlemen:

On May 29, 1984, Mr. C. W. Hayes, Vogtle Project Quality Assurance Manager, reported a potential deficiency to Mr. John Rogge of the USNRC concerning the acoustical lining attached to the inside of safety-related HVAC ductwork. In previous correspondence, Georgia Power Company indicated that a final report on the evaluation of this concern would be submitted to the NRC by August 10, 1984. Georgia Power Company has completed its evaluation and has concluded that this condition is reportable as a substantial safety hazard and a significant deficiency.

Based upon NRC guidance in NUREG-0302, Revision 1, and other NRC correspondence regarding duplicate reporting of significant deficiencies and substantial safety hazards, Georgia Power Company is reporting this event as a significant deficiency pursuant to the requirements of Part 10 CFR 50.55 (e). A summary of our evaluation is attached for your information.

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

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Yours truly,

D. O. Foster

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Attachment

xc: U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

R. J. Kelly
R. E. Conway
G. F. Head
J. T. Beckham
D. N. MacLemore
W. T. Nickerson

D. E. Dutton
W. F. Sanders
R. H. Pinson
B. M. Guthrie
R. A. Thomas
C. S. McCall

J. A. Bailey
O. Batum
H. H. Gregory
C. W. Hayes
E. D. Groover

L. T. Gucwa
M. Malcom
G. Bockhold
P. D. Rice
J. L. Vota

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**EVALUATION FOR A SUBSTANTIAL SAFETY HAZARD
EVALUATION FOR A SIGNIFICANT DEFICIENCY**

HVAC Interior Duct Lining

Initial Report:

On May 29, 1984, Mr. C. W. Hayes, Vogtle Quality Assurance Manager for Georgia Power Company, advised Mr. John Rogge of the USNRC of a potential deficiency involving the attachment of an acoustic sound attenuation liner to safety-related HVAC ductwork. In a subsequent letter to the NRC, Georgia Power Company indicated that the NRC would be advised of the results of this evaluation by August 10, 1984.

Background Information:

The acoustic liner is attached to the inside of the HVAC duct walls to reduce the sound level transmitted by the air-stream from the air conditioning units. The liner must remain fastened to the inside of the duct in order to perform its acoustical function. The acoustic liner is attached to the HVAC duct walls using mechanical fasteners and adhesive in accordance with the Duct Liner Application Standard published by the Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA). This performance standard invoked by the specification for the ductwork permits attachment of the mechanical fasteners by mechanical processes such as riveting or welding, but does not specify specific attachment or weldment procedures. The vendor processes involving the welding of the mechanical fasteners and the adhesive bonding were reviewed and approved by Bechtel Power Corporation.

Loose and sometimes unattached mechanical fasteners were observed by the Georgia Power Company receiving inspectors. A survey of uninstalled duct sections revealed that additional mechanical fasteners were loose or missing. Additionally, the adhesive bond applied between the liner and the duct was noted as not being uniformly applied, i.e., the bond was stronger in some ducts than others. Based on the identification of these items as a potential safety concern by the Southern Company Services Quality Assurance Department, a stop-work order was placed on the vendor, Pullman Construction Industries.

Engineering Evaluation:

The safety concern identified was the potential blockage of the safety-related ductwork resulting from the failure of the adhesive and welded fasteners to keep the acoustic liner in its proper position. An acoustic liner can be used to reduce sound levels transmitted by an air-stream from air conditioning units. If a liner is used, it must remain fastened to the inside of the safety-related duct so that the

HVAC system will perform its intended safety function. In this case, the liner would be attached to ductwork supplying air to the Control Room. Also, the architect/engineer, Bechtel Power Corporation, specified that the welding process used to attach the lining must meet SMACNA requirements. The welds must be able to withstand a 50 pound tensile test to pass this standard. A field test demonstrated the ability of the welds to pass this test. However, the field tests indicated that the welds could not withstand shear or bending loads.

Since the design, fabrication, and service conditions of both trains of the system are essentially the same, a common mode failure of the Control Room Engineered Safety Feature (ESF) HVAC system can be postulated after a design basis earthquake due to the identified welding failures of mechanical fasteners in shear and bending loading conditions and poor adhesive bonding. This postulated failure assumes that the lining can become loose and cause a reduction in the air flow to the Control Room. The reduced air would result in a loss of pressurization in the ESF HVAC system and a failure to provide a suitable and safe environment for operating personnel and control equipment.

Review for Quality Assurance Program Breakdown:

A review of the quality assurance program at Pullman Construction Industries has not indicated a breakdown in their quality assurance program.

Conclusion:

In the absence of an extensive testing program to prove the adequacy of the welds due to a postulated seismic event, it has been assumed that the liner attached to the HVAC ductwork could come loose and cause a blockage of the ductwork. This blockage will result in a non-suitable environment for the Control Room.

It has been concluded that this concern represents a significant deficiency since it adversely affects plant safety and represents a deficiency in the construction of a system which requires repair to meet the criteria and basis stated in the Safety Analysis Report. Also, it has been concluded that the defects associated with the mechanical fasteners constitute a substantial safety hazard. However, based upon regulatory guidance in NUREG-0302, Revision 1, and other correspondence, Georgia Power Company is reporting this concern under the reporting requirements of 10 CFR 50.55 (e).

Corrective Action:

Since the deficiency was not repairable in place, the acoustic liner will be removed from all safety-related ducts. When duct installation is completed, a study will be performed to determine if alternative acoustical equipment is needed to reduce the sound level produced by large air conditioning units.