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Georgia Power

the southern electric system

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

ALL: 34

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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;
Control Room Filtration Unit Housings

Attention: Mr. James P. O'Reilly

Gentlemen:

On March 23, 1984, Mr. C. W. Hayes, Vogtle Project Quality Assurance Manager, reported a potential deficiency to Mr. John Rogge of the USNRC that concerned the design of the control room filtration unit housing. 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.

Yours truly,

D. O. Foster
D. O. Foster

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

xc: R. J. Kelly	D. E. Dutton	J. A. Bailey	L. T. Gucwa
R. E. Conway	W. F. Sanders	O. Batum	M. Malcom
G. F. Head	R. H. Pinson	G. Bockhold	H. H. Gregory, III
C. W. Hayes	P. D. Rice	B. M. Guthrie	J. T. Beckham, Jr.
D. M. MacLemore	R. A. Thomas	E. D. Groover	J. L. Vota

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EVALUATION FOR A SUBSTANTIAL SAFETY HAZARD
EVALUATION FOR A SIGNIFICANT DEFICIENCY

Control Room Filtration Unit Housing Design

Initial Report:

On March 23, 1984, Mr. C. W. Hayes, Vogtle Project Quality Assurance Manager, informed Mr. J. Rogge of the USNRC of a potential deficiency in the design of the control room filtration unit housings.

Background Information:

During a review of the control room filtration unit specification (X4AJ07), it was determined that the internal pressure was incorrectly incorporated into the data sheets for the control room filtration unit housing. Two redundant and physically separated air filtration unit trains are provided for each power unit to process intake airflow and recirculation airflow in the shared control room. Thus, the control room has four filtration units.

The control room filtration units (1-1531-N7-001, 1-1531-N7-002, 2-1531-N7-001 and 2-1531-N7-002) provide cooling, moisture elimination, high efficiency particulate filtration and activated carbon adsorption of all the air supplied to the control room to ensure protection of the plant operators, instrumentation and equipment following a design basis event. Any one of the four units is capable of meeting the cooling, air filtration and pressurization requirements following a design basis event. These units were fabricated by American Air Filter, Inc.

The Bechtel Power Corporation specification for the control room filtration unit housing required the filter plenum to withstand negative 20 inches water gauge (w.g.). This is in compliance with ANSI N509-1980 paragraph 4.6.2.2, "Units located on the inlet side of the fan...shall be designed to withstand a negative internal pressure equal to or more negative than the peak pressure of the fan." When originally submitted, the vendor drawings were corrected to indicate the negative 20 inches w.g. design requirement, however, subsequent revisions of the vendor drawings were inadvertently approved which indicated a negative 2 inches w.g. Because of this, the filtration units were fabricated and shipped to the jobsite with a design pressure of negative 2 inches w.g. instead of negative 20 inches w.g. as required by the system design.

Engineering Evaluation:

The filtration units and their enclosure housings are located on the suction side of the fans. The fans are designed to develop a differential pressure of 14 inches of water. During normal testing/operation of the filtration system, the filtration housings will experience a pressure of at least negative 6 inches w.g., due to the combined pressure drop across all the components inside the housing. These consist of a pressure drop across the moisture separator of 0.75 inch w.g., the electric heater of 0.5 inch w.g., the first HEPA filter bank of 1 inch w.g., the charcoal adsorber of 1.25 inches w.g., the second HEPA filter bank of 1 inch w.g., and the cooling coil of 1.85 inches w.g. All the control room filtration unit housings are designed and fabricated to withstand negative 2 inches w.g. Therefore it is likely that

the unit housings will fail during normal testing/operation of the filtration system. If the unit housings survive initial startup, they would eventually fail as pressure drop increases when filters become loaded with dirt.

Additionally, in the unlikely event that the inlet dampers failed in the closed position and/or an obstruction occurred in the duct work during filtration system operation, the filtration housings will experience the full fan shut off pressure of negative 14 inches w.g. This condition would make the unit housing failures almost certain.

Because the design and fabrication of all control room filtration units are identical, the units are subject to the possibility of common mode failure during system operation. This would result in the loss of all the control room filtration units. Because the deficient unit housing design can result in a failure of the control room filtration units and consequential failure of plant operators' protection with potential radiation dose exposure in excess of guidelines, it has been concluded that this deficiency represents a substantial safety hazard and significant deficiency in the control room filtration unit design, and is reportable under both 10 CFR Part 21 and 10 CFR 50.55(e).

Evaluation of Quality Assurance Program Breakdown:

The fabrication of the control room filtration units was in accordance with approved drawings and procedures. This is an isolated occurrence, and does not impact any other HVAC units. Therefore, it has been concluded that a quality assurance program breakdown does not exist.

Conclusion:

This event is considered reportable since, were it to have remained uncorrected, it could have affected adversely the safety of operation of the nuclear power plant at any time throughout the expected lifetime of the plant. Additionally, this event represents a significant deficiency in the final design as approved and released for construction such that the design does not conform to the criteria and bases of the safety analysis report. This event also represents a substantial safety hazard since it could have resulted in the exceeding of exposure guidelines to the plant operators.

In NUREG-0302, Revision 1 and other NRC correspondence, the NRC advises that the duplicate reporting of events is not required. Georgia Power Company has evaluated and concluded that this event is reportable as a substantial safety hazard and significant deficiency. However, to avoid duplicate reporting, Georgia Power Company is reporting this event under the reporting requirements of 10 CFR 50.55(e).

Corrective Action:

The vendor has redesigned all four control room filtration unit housings to withstand the required internal pressure of negative 20 inches w.g. and is presently fabricating the necessary material. The fabricated materials for reinforcing the unit housing, together with the required drawings, will be shipped to the jobsite for field installation by Georgia Power Company. A supplementary analysis to update the seismic analysis of the units will be performed.

This corrective action will upgrade the units to meet all specification requirements and to comply with ANSI N509-1980, paragraph 4.5.2.2.