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United States Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II - Suite 2900
101 Marietta Street, Northwest
Atlanta, Georgia 30323

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Reference: Vogtle Electric Generating Plant-Units 1 and 2, 50-424, 50-425; Reliance Electric Junction Boxes-Field Mounting Configuration; GN-430, dated 10/12/84.

Attention: Mr. James P. O'Reilly

In previous correspondence concerning the above referenced subject, Georgia Power Company indicated that a final report on the evaluation of this concern would be submitted to the USNRC by February 15, 1985.

Georgia Power Company has completed its evaluation and has determined that a reportable condition per the criteria of Parts 10 CFR 50.55(e) and 10 CFR 21 could exist. Based upon NRC guidance in NUREG-0302 and other correspondence, Georgia Power Company is reporting this condition per the reporting criteria of Part 10 CFR 50.55(e). Enclosed is a summary of the evaluation of this condition.

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

Yours truly,

D. O. Foster

REF/DOF/tdm
Enclosure

xc: U. S. Nuclear Regulatory Commission, Document Control Desk

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EVALUATION FOR A POTENTIALLY REPORTABLE CONDITION

RELIANCE ELECTRIC CLASS 1E JUNCTION BOXES-
FIELD MOUNTING CONFIGURATION

Initital Report

On July 20, 1984, Mr. C. W. Hayes, Vogtle Quality Assurance Manager, informed Mr. John Rogge and Mr. Vince Panciera of the USNRC Region II of a potentially reportable condition concerning the mounting of Reliance Electric Class 1E Junction Boxes.

Background Information

The seismic qualification of Reliance Electric Class 1E junction boxes was performed using bolted connections to a rigid structure at the junction box mounting tabs.

The installation drawing (AX2D94V052) allowed the mounting of the junction boxes by bolting the interior to the support structure. Non-rigid supports were also allowed on the installation drawing for the support of the junction boxes. Mounting the junction boxes in these configurations could subject the junction boxes to larger accelerations than those used in the qualification testing program of Reliance Electric. This condition was identified during the preparation of the Equipment Qualification Data Package for Class 1E junction boxes.

Engineering Evaluation

Bechtel Power Corporation performed a comparative analysis to determine the acceptability of the alternate bolted connections within the junction box interior when attached to a rigid support. Junction boxes were evaluated by comparing the as-qualified mounting details (largest junction box mounted using tabs) versus bolting through the junction box interior. The comparative analysis considered both frequency and stress and concluded that the alternative mounting method (bolting through the junction box interior) was adequate. It was also determined that seismic qualification requirements were met in the alternative mounting methods using the junction box mounting tabs, even when non-rigid supports are employed.

Support flexibility was evaluated by calculating the fundamental natural frequency of the support. If the computed fundamental frequency was equal to or greater than 33 cps, the support was shown to be rigid and no additional evaluation was required. If the computed fundamental frequency was less than 33 cps, the support is considered flexible. The amplication of the response spectra was calculated by:

(1) Generating synthetic time histories conforming to the specified horizontal and vertical response spectra.

(2) Using these time histories to develop the amplified response spectra at the attachment location of the junction box.

(3) Comparing the amplified response spectra to those spectra used in the seismic qualification of the junction boxes.

The comparison showed that the amplified levels of accelerations caused by the support flexibility were enveloped by the seismic qualification test levels in the frequency range of interest for the junction boxes. It was concluded that the flexibility of the supports would not alter the seismic qualification of the junction box as tested.

During a walkdown inspection of existing installations, some junction boxes (5) were found using alternate bolting methods to possible non-rigid supports. These junction boxes are mounted to strut channels attached to concrete walls using expansion anchors. The existing calculations demonstrate that a distance between expansion anchors up to 30 inches will provide rigid support. Even though the drawing details for this configuration permit up to a 42 inch distance between anchors, the maximum distance utilized for these five junction boxes is 19 inches. Therefore, for these junction boxes, the supports are rigid and seismic qualification is not impacted.

Another drawing detail allows the attaching of only part of the junction box to the support with the rest being free as a cantilever. This mounting configuration would result in exceeding the seismic qualification test levels. However, no junction box installations have been found using this configuration.

Evaluation of Quality Assurance Program Breakdown

A review of the Bechtel Quality Assurance Program indicated that adequate interdisciplinary review procedures exist. This incident illustrates an occasional incomplete implementation of existing adequate procedures and is not indicative of a significant breakdown in the quality assurance program.

Conclusion

Since the detail drawing was released and used for construction, the possibility does exist that inappropriate details could have been utilized in the mounting of the Class 1E junction boxes. The use of these details could have affected adversely the seismic qualification of some junction boxes. It has been concluded that the condition does represent a reportable condition per the crieria of Part 10 CFR 50.55(e) and Part 10 CFR 21. Based upon guidance in NUREG-0302 Revision 1 and other NRC corespondence, Georgia Power Company is reporting this condition per the criteria of Part 10 CFR 50.55(e).

Corrective Action

The drawing detail utilizing strut channels attached to concrete walls using expansion anchors are being revised to limit the maximum distance between anchors to 30 inches for Class 1E junction boxes.

The detail allowing attachment of only part of the junction box to the support has been revised to provide complete attachment to Class 1E junction boxes such that seismic qualification requirements are met.

A walkdown inspection of existing Class 1E junction box installations was conducted to determine which alternate bolting methods have been used. An additional walkdown will be conducted shortly after issuance of the revised details to ensure that installations performed in the interim since the first walkdown do not impact seismic qualification requirements.