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

File: X7BG03-M61
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Reference: Vogtle Electric Generating Plant-Units 1 and 2, 50-424, 50-425;
Nuclear Service Cooling Water Tower Crossover Piping; Letter GN-
346 dated April 23, 1984.

Attention: Mr. James P. O'Reilly

Gentlemen:

In our previous correspondence, Georgia Power Company indicated that the NRC would be advised by June 5, 1984, of our evaluation concerning the location of the Nuclear Service Cooling Water Tower Basins Intertie Piping for each unit in an area which may be affected by the potential liquefaction of nearby in-situ soil under SSE conditions. Georgia Power Company has completed its evaluation and has concluded that this condition is reportable as a substantial safety hazard (10 CFR 21) and a significant deficiency [10 CFR 50.55(e)].

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

Yours truly,

D. O. Foster

REF/DOF/tdm

Attachment

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

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Evaluation for a Substantial Safety Hazard
Evaluation for a Significant Deficiency

Nuclear Service Cooling Water Tower Basins Intertie Pipe

Initial Report:

This subject was initially reported to Mr. John Rogge of the Nuclear Regulatory Commission (NRC) on March 23, 1984 by Mr. C. W. Hayes of Georgia Power Company (GPC). An interim report was submitted to the NRC by GPC in letter GN-346, dated April 23, 1984. At that time, GPC indicated to the NRC that a final report would be submitted by June 5, 1984.

Background Information:

During an engineering review of buried piping locations, initiated to evaluate various backfill placement techniques, safety-related Nuclear Service Cooling Water (NSCW) transfer pump discharge pipes (1202-036-6" and 1202-029-6") in Unit 1 and Unit 2 were found to be routed into a portion of Category I backfill that may be affected by the potential liquefaction of the adjacent in-situ sand stratum of in-situ soil.

The routing drawings for these pipes were issued for construction purposes for both units. The subject piping for Unit 1 had been installed but not backfilled against. The piping for Unit 2 had not been installed.

All safety-related structures and systems must be founded on material capable of withstanding extreme environmental loads. The upper sand stratum of in-situ soil at the Vogtle site has a potential for liquefaction under safety shutdown earthquake (SSE) conditions. The site has, therefore, been excavated down to a competent marl bearing stratum and the upper sand stratum replaced by Category I backfill. There is a portion of Category I backfill that may be affected by the potential liquefaction of the adjacent in-situ sand stratum (see figure 1). Safety-related structures, buried piping, and buried electrical duct banks are placed at various depths in the backfill and are located so that the distribution of their foundation stresses remain within the limits of the portion of the Category I backfill which is not dependent on the adjacent in-situ sand stratum for support.

Evaluation of Impact on Safety of Plant Operation:

The design storage capacity of cooling water inventories from both train A and train B NSCW tower basins is required for post-LOCA service if the make-up water to the NSCW basins is not available. This could happen if offsite power is lost or the make-up water systems to the NSCW basins became inoperable because these make-up systems are non-seismic Category I. In the event that an SSE occurs causing a LOCA and a single failure of one NSCW train, the ability to transfer cooling water from one NSCW tower basin to the other is essential to satisfy the inventory requirement. In the event of the loss of one train, breaks in lines 1202-030-6" and 1202-029-6" would prevent the transfer of cooling water from the basin of the affected train to the basin of the unaffected train. In addition, in the event that the transfer system was primed or in operation at the time of a break, as much as 12% of the capacity of the basin of the unaffected train could be lost due to siphoning, resulting in only 44% of the required total capacity being available for post-LOCA service.

A geotechnical evaluation indicates that some part of the NSCW transfer piping has been routed in a portion of Category I backfill that may undergo significant deformations if the adjacent in-situ sand stratum were to liquefy under the SSE conditions. The degree to which the NSCW transfer piping would be affected was not evaluated, but the potential exists for loss of function of the subject piping.

It is therefore concluded that, with the existing routing of the NSCW transfer piping, the potential exists for the NSCW tower basin inventory to be less than the required capacity for post-LOCA service requirements.

Evaluation of Breakdown of Quality Program:

Routing of buried Category I piping is coordinated between Bechtel Power Corporation's Plant Design Section and Civil/Structural Section, by memos and review of drawings. The misplacement of the subject lines was not detected during the civil structural review of the plant design layout drawings.

There was no breakdown in the QA program, this was an isolated event.

Conclusion:

It has been concluded that, if this discrepancy had remained uncorrected, the safe operation of the plant could have been compromised if liquefaction of adjacent in-situ sands stratum had occurred under SSE conditions. This could have resulted in the plant not meeting FSAR and NRC regulatory requirements for the post-LOCA water supply. Therefore, this condition is considered to be reportable under the reporting requirements of Part 10 CFR 50.55(e) and Part 10 CFR 21. Based on regulatory guidance in NUREG-0302, Rev. 1 and other documents, in order to avoid duplicate reporting, Georgia Power Company is reporting this condition under the reporting requirements of Part 10 CFR 50.55(e).

Corrective Actions:

1. Pipe lines 1202-030-6" and 1202-029-6" in Units 1 and 2 have been rerouted into acceptable backfill areas and revised drawings have been issued for construction. (Reference letters BG-31964, dated April 23, 1984 and BG-32078, dated May 11, 1984.)
2. A review of the location/routing of all safety-related structures, buried piping, and buried electrical duct banks concluded that the potential liquefaction of adjacent in-situ sand stratum will not affect their safety functions.
3. A review of design control measure concluded that the design criteria for Category 1 structures (DC-1000-C), buried piping (DC-2144-B) and raceway systems (DC-1810) should be revised to specifically require that Category I structures, buried piping and electrical duct banks be founded in the portion of the backfill which is not susceptible to the effects of the liquefaction of the adjacent in-situ soil. The revisions to the above design criteria are expected to be completed by June 29, 1984.