

Central File

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POWER BUILDING

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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

September 18, 1980

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Re: RII:JPO
79-14
50-269, -270, -287

Dear Mr. O'Reilly:

The purpose of this letter is to provide information relating to a nonconformance item as required by IE Bulletin 79-14, Item 4. This nonconformance item was determined during the performance of compliance work pertaining to the Oconee Nuclear Station Reactor Building Spray (RBS) system.

During this effort, it was determined that the stress analysis for the original design of the spray piping was unavailable. In the absence of this analysis, the stress in the piping was analyzed and the support/restraint loads determined on the structural frame, under the current IE Bulletin 79-14 compliance program.

For the Oconee Unit 3 RBS system, the analysis based on a DBE loading with the spray system piping empty, and using current industry and NRC accepted practices, indicates that the magnitude of the stresses in both trains of the spray grid piping do not exceed 38,520 psi (2.4 Sh). The high stress locations are generally at the junction of the branch pipe and the header where the design stress intensification is greater than 7. From this analysis, it is possible to conclude that piping structural integrity will not be impaired in the event of a design basis earthquake.

The analysis based on the spray piping filled with water (i.e., in the "wet" condition) using OBE instead of DBE, and using .5% damping showed that the stresses are in the order of 91,000 psi (with a stress intensification factor of 7.53) for one train and 86,000 psi (with a stress

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intensification factor of 8.43) in the other train. The large stress intensification factors at unreinforced stub-in branch connections have resulted in high seismic stresses. The calculated stresses would be higher if DBE had been used in the analysis.

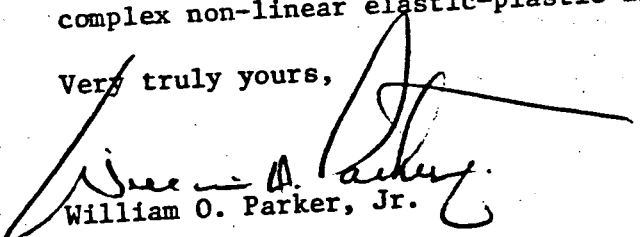
In both of the above calculations, the linear elastic analysis technique was used. An evaluation of the effect of this nonconformance upon system operability under specified earthquake loadings in the "wet" condition has not been performed. Such an evaluation of operability would require more complex non-linear elastic-plastic analysis techniques.

In lieu of performing this complex analysis, Duke will modify the junctions of the affected branch pipes and headers.

In order to provide additional resistance against lateral movements of the Reactor Building spray piping, auxiliary steel will be added to the existing overhead steel grid system that presently supports the individual spray lines and the spray line headers. This existing grid is composed of standard structural shapes supported from the Reactor Building shell wall (see attached drawing O-65w). The spray piping is presently attached to the grid with u-bolts. At locations identified by the piping stress analyst, additional lateral supports will be provided by attaching steel members to the grid as shown in Figure 54B-O-1477-RBS-H1. This design provides the required additional lateral support at approximately 110 locations, while minimizing installation problems.

This modification will be completed during the forthcoming outages of Oconee Unit 2 in October 1980, Oconee Unit 1 in November 1980, and the Oconee Unit 3 refueling outage starting in late 1980. The period of time required to install this modification on all three Oconee units is significantly less than that period of time estimated to complete the complex non-linear elastic-plastic analyzers.

Very truly yours,


William O. Parker, Jr.

RLG:vr
Attachment

cc: Director,
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Director
Division of Operating Reactors
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