

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

March 5, 1986

BLRD-50-438/84-57

BLRD-50-439/84-53

U.S. Nuclear Regulatory Commission
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - INCORRECT RESPONSE SPECTRA IN
ANALYSIS OF REACTOR BUILDING SPRAY PIPING SYSTEM - BLRD-50-438/84-57,
BLRD-50-439/84-53 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
S. Weise on November 8, 1984 in accordance with 10 CFR 50.55(e) as NCR BLM CEB
8417. This was followed by our interim reports dated December 7, 1984 and
July 9, 1985. Enclosed is our final report.

If you have any questions, please get in touch with R. H. Shell at
FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. L. Gridley
R. L. Gridley
Manager of Licensing

Enclosure

cc: Mr. James Taylor, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center (Enclosure)
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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
INCORRECT RESPONSE SPECTRA IN ANALYSIS
OF THE REACTOR BUILDING SPRAY PIPING SYSTEM
BLRD-50-438/84-57 AND BLRD-50-439/84-53

NCR BLN CEB 8417

10 CFR 50.55(e)

FINAL REPORT

Description of Deficiency

Floor response spectra were not generated for the dome of the primary containment structure. In 1979, amplification factors to apply to the response spectra at the top of the cylinder (elevation 875) were informally provided to piping analysis personnel for elevation 886. Elevation 886 is the maximum elevation of the containment spray piping system, but the supports for this system are attached as high as elevation 890.2 in the dome. The response spectra at elevation 890.2 is higher than the response spectra at elevation 886. Therefore, incorrect response spectra were used in the analysis of the containment spray piping system.

Lax supervisory control allowed the information to be requested, provided, and used without proper understanding of and adherence to the QA documentation, review, and control requirements of the following procedures:

EP 1.28, "Control of Documents Affecting Quality," issued January 3, 1978

EP 3.02, "Seismic Design, Review, and Control," issued September 3, 1977

EP 3.03, "Design Calculations," issued August 22, 1974

The information was informally provided to the users and was not incorporated into existing Civil Engineering Branch Report CEB-75-24. This problem is considered to be a random occurrence and applies only to the Bellefonte Nuclear Plant (BLN) spray piping system.

Safety Implications

A design of the spray piping system based on the incorrect response spectra would be unconservative and could result in overstressed conditions in the spray piping system components during a seismic event. Such a condition could lead to failure of a component and therefore could have jeopardized the safe operation of the plant had it remained uncorrected.

Corrective Action

In order to correct this problem, seismic response spectra for elevation 890.2 of the containment structure have been generated and provided to piping analysis personnel. These spectra have also been included in a revision to the seismic analysis report. The reactor building spray piping system is being reanalyzed using the correct response spectra. Supports will be redesigned or added as required by the reanalysis. The construction work for each unit will be complete six months before the fuel load date of the applicable unit.

In order to prevent this problem from recurring, training has been provided on QA documentation, review, and control as follows:

CEB-EP 21.38, "Preparing and Distributing Civil Engineering Branch Reports," issued April 25, 1983, delineates specific supervisory controls to be exercised on information provided in CEB reports. Training was conducted on this EP on June 6, 1983. The "Bellefonte Rigorous Analysis Handbook," section BLN-RAH-207, issued March 5, 1984, provides guidance in subsection 5.0 in the use of response spectra.

Training on other applicable documents, EP 1.28, EP 3.02, and EP 3.03, was conducted on June 6 and 10, 1983.

Training was conducted on OEP-06, "Design Input," OEP-07, "Calculations," and OEP-08, "Design Output" when these documents replaced the procedures listed above.