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TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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WBRD-50-391/83-03

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

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNIT 2 - IMPROPER OVERLAPPING ANALYSIS TECHNIQUES -
WBRD-50-391/83-03 - FINAL REPORT

The subject deficiency was initially reported to NRC-Region II Inspector P. Fredrickson on January 11, 1983 in accordance with 10 CFR 50.55(e) as NCR WBN CEB 8221 R1. Interim reports were submitted on February 4, June 17, and September 13, 1983. Our final report for unit 1 and fourth interim report for unit 2 was submitted on October 21, 1983. Additional interim reports for unit 2 were submitted on June 28, 1984, and October 23, 1985. Enclosed is our final report for unit 2.

If there are any questions, please get in touch with J. A. McDonald at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley
R. Gridley, Director
Nuclear Safety and Licensing

Enclosure

cc (Enclosure):

Mr. James Taylor, Director
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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNIT 2
IMPROPER OVERLAPPING ANALYSIS TECHNIQUES
WBRD-50-391/83-03
NCR WBN CEB 8221
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Analysis overlapping techniques were not incorporated correctly in the analytical mathematical models for certain piping analysis problems for Watts Bar Nuclear Plant (WBN). Terminal points were unconservatively overlapped using snubbers; therefore, terminal stiffness was not included in the thermal analysis. Affected piping systems were essential raw cooling water, component cooling water, chemical and volume control, safety injection, auxiliary feedwater, and reactor coolant systems.

The root cause of this deficiency is that structural overlap techniques were used by the WBN piping analysis group before they were issued in a controlled document. As a result, these techniques were misused and/or misunderstood.

Safety Implications

The use of inadequate analysis techniques led to potentially inadequate safety-related piping supports which could have failed under stress. This could have adversely affected safe operations of the plant.

Corrective Action

TVA has established guidelines for use of structural overlap techniques for WBN. Those guidelines have been incorporated into the WBN Rigorous Analysis Handbook (RAH), section WBN-RAH-202. This will prevent recurrence of the subject deficiency.

All WBN analysis problems involving overlap techniques have been reviewed. All problems determined to be unacceptable were revised to either eliminate the overlap area or to comply with the established guidelines, and were reanalyzed per Engineering Change Notice (ECN) 4862. Several modifications were determined to be necessary as a result of the reanalysis. The modifications will be completed before initial fuel loading for WBN unit 2.