

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

83 DEC 5 ~~December 1, 1983~~
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WBRD-50-390/83-28
WBRD-50-391/83-28

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - SEISMIC ANALYSIS OF THE NORTH STEAM
VALVE ROOMS - WBRD-50-390/83-28, WBRD-50-391/83-28 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
L. Watson on May 2, 1983 in accordance with 10 CFR 50.55(e) as NCR WBN
CEB 8301. Interim reports were submitted on May 24 and September 21, 1983.
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

L. M. Mills
by RLL

L. M. Mills, Manager
Nuclear Licensing

Enclosure

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

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
SEISMIC ANALYSIS OF THE NORTH STEAM VALVE ROOMS
NCR WBN CEB 8301
WBRD-50-390/83-28, WBRD-50-391/83-28
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

In reviewing the report "Dynamic Earthquake Analysis of the North Steam Valve Room" in accordance with the Division of Engineering Design (EN DES) Special Engineering Procedure (SEP), SEP 82-14, it was found that TVA analysts failed to follow requirements in Watts Bar Design Criteria WB-DC-20-24 when doing the original analysis. Specifically, WB-DC-20-24 requires that natural frequencies be used in the generation of acceleration response spectra, and this was not done, resulting in clipping of the peaks of the response spectra. Also, during the original analysis, the torsional effects of the structure were considered insignificant and analysis did not include these effects. Later changes in the structural configuration and weights of attached masses have caused changes in structural responses of approximately 40 percent, and as the valve rooms are an open structure, the inclusion of the torsional effects in the analysis is required. However, because of a lack of procedure, the structural and load changes made were never sent to the analysts for review and reanalysis.

Safety Implications

Failure to consider natural frequencies or structural and load changes in the valve room design could result in the design and installation of inadequate supports for various safety-related piping in the rooms. This could cause the supports to fail during a seismic event which could cause a subsequent failure of the piping and adversely affect safe operation of the plant.

Corrective Action

TVA has completed its reanalysis of the north steam valve rooms and has included the current structural configurations and weights of attached masses, torsional effects, and the requirements of WB-DC-20-24 into this reanalysis. Through this review, TVA has determined that the only changes required are modification of 14 supports. The design changes will be done under engineering change notice (ECN) 4154 by December 30, 1983, with the corresponding field work completed by March 2, 1984.

To prevent a recurrence of this problem, EN DES Engineering Procedure (EP) 3.02 has been revised to ensure that any future changes in structural configurations or loads are coordinated with the Civil Engineering Support Branch's seismic analysis personnel, and intensive training in relevant engineering procedures for these personnel has been conducted and documented.