

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

83 OCTOBER 9, 1983
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WBRD-50-390/82-16, WBRD-50-391/82-15
BLRD-50-438/82-11, BLRD-50-439/82-11

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 AND BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - RESOLUTION OF
UNANTICIPATED VIBRATORY LOADING CONCERNS - FINAL REPORT

The subject deficiency was initially reported to Inspector D. Quick on January 20, 1982 as NCR GEN CEB 8201. Interim reports were submitted on February 19, April 28, September 24, and December 15, 1982 and April 1 and June 17, 1983. Enclosed is our final report.

NRC-OIE Inspector P. E. Fredrickson was notified on September 22, 1983 that this submittal would be several days late because of final review and coordination efforts.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

DS Kammer

for 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. 20535

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

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ENCLOSURE

WATTS BAR AND BELLEFONTE NUCLEAR PLANTS UNITS 1 AND 2,
NCR GEN CEB 8201
WBRD-50-390/82-16, WBRD-50-391/82-15; BLRD-50-438/82-11, BLRD-50-439/82-11;
RESOLUTION OF UNANTICIPATED VIBRATORY LOADING CONCERNS
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

TVA has identified a programmatic deficiency in detection and documentation of resolution of certain anchorage and support problems in fluid systems resulting from unanticipated vibratory loading occurring over an extended period of time. This type of loading could cause degradation or eventual failure of the anchorage. The program deficiency may occur only in systems or portions of systems which experience continuous or extended periods of vibrations greater than those considered in design. At present, emphasis in the vibration program is placed on qualifying piping and equipment to an established qualification level in defined modes of operation. It does not identify potential problems except where unacceptable piping and/or equipment vibration levels are recorded.

Safety Implications

Unanticipated vibratory loading could cause degradation or eventual failure of the anchorage. This could adversely affect the safety of operations of the plant.

Corrective Action

TVA has taken corrective action on the subject deficiency as follows:

Watts Bar

New requirements for assessing significance of piping vibration problems during preoperational testing were issued by a design input memorandum (DIM) DIM-WB-DC-40-31.16-1. This DIM identifies line segments with potential long-term vibration problems as they relate to pipe supports and anchors and lists conditions for visually identifying vibration problems. These new requirements have been incorporated into test procedures/instructions.

Bellefonte

Requirements for visually assessing significance of piping vibration problems during construction testing were issued by specification revision notice (SRN) SRN-N4M-870-1. New requirements for assessing significance of piping vibration problems during preoperational testing were issued by revision 1 to Mechanical Design Standard DS-M2-16.1.

This revision provides detailed instructions on test requirements, the test process, and the acceptance criteria for vibrations qualification of piping and rotating machinery, exclusive of reactor internals, turbine generators, and turbine generator foundations. The purpose of TVA's vibration test program is to detect and correct unacceptable vibrations in safety- and nonsafety-related equipment before plant startup. The vibrations testing is designed to satisfy TVA's commitments in the FSAR and applicable design criteria. The intent is also to ensure that reasonable reliability exists for all equipment throughout the plant.

Piping and rotating machinery during steady-state and transient modes are examined in the preoperational testing phase of plant construction. This encompasses several levels of investigation depending on the expected response and the criticality of operation of the system. These investigations are integrated into the preoperational testing by EN DES through the preoperational test-procedures describing the scope of the tests to be performed (scoping documents).

Future TVA Nuclear Plants

TVA Mechanical Design Standard DS-M2-16.1, as referenced above, applies to all TVA nuclear plants. This will assure that unanticipated vibrational loadings or problems will be identified during preoperational testing for these plants.

The requirements issued will be used to identify line segments with potential long-term vibration problems especially as it relates to pipe supports and anchors. The requirements include provisions for reporting, evaluating, taking corrective action, and long-term tracking. This action will prevent recurrence of this concern in the future.