TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

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October 4, 1983

WBRD-50-390/81-23
WBRD-50-391/81-22

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 - DISCREPANCY IN AS-BUILT VERSUS AS-ANALYZED PIPING SYSTEMS - WBRD-50-390/81-23, WBRD-50-391/81-22 - FINAL REPORT FOR UNIT 1 AND SIXTH INTERIM REPORT FOR UNIT 2

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on February 26, 1981 in accordance with 10 CFR 50.55(e) as NCR WBN SWP 8108. Our first interim report was submitted on March 30, 1981. NCR WBN SWP 8148 was reported to NRC-OIE Inspector Crlenjak on April 29, 1981. Mr. Crlenjak was informed that NCR WBN SWP 8148 would be reported with NCR WBN SWP 8108 as WBRD-50-390/81-23 and WBRD-50-391/81-22. Our second interim report, covering both of these NCRs, was submitted on August 26, 1981. NCR 3730R R1 was reported to Inspector R. V. Crlenjak on October 30, 1981. Mr. Crlenjak was informed that NCR 3730R R1 would be reported with NCRs WBN SWP 8108 and WBN SWP 8148 as WBRD-50-390/81-23 and WBRD-50-391/81-22. Our reports, covering these NCRs were submitted on May 20, 1982 and February 1 and June 30, 1983. Enclosed is our final report for unit 1 and our sixth interim report for unit 2. We expect to provide additional information on unit 2 by October 31, 1984.

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

L. M. Mills, Manager
Nuclear Licensing

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Enclosure
cc: Mr. Richard C. DeYoung, Director (Enclosure)
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
DISCREPANCIES IN AS-BUILT VERSUS AS-ANALYZED PIPING SYSTEMS
10 CFR 50.55(e)
NCRs WBN SWP 8108, WBN SWP 8148, AND 3730R R1
WBRD-50-390/81-23, WBRD-50-391/81-22
FINAL REPORT FOR UNIT 1 AND SIXTH INTERIM REPORT FOR UNIT 2

Description of Deficiency

NCR WBN SWP 8108

During the evolution of the pipe support design effort, inconsistencies have developed between the support locations as specified on the support drawings and the analysis isometrics. The support drawings are used for installation and during the field inspection process TVA's Division of Construction (CONST) refers to the isometric for the support node locations. Construction specification G-43 allows an acceptable relocation tolerance from the analyzed point; however, some support drawings specify locations outside this tolerance. These discrepancies came about due to the earlier practice of updating the isometrics only if the piping analyses were changed. The original purpose of the isometrics was to depict piping analysis computer models rather than as designed or installed configurations; therefore, the isometrics were not updated except in cases where the analyses were affected.

NCR WBNSWP 8148

Construction specification G-43 provides support location tolerances from the analysis point. For rigorously analyzed piping, the analysis point is located by the analysis isometric. During the support design phase, the designer may have used part of the relocation tolerance. Sequoyah/Watts Bar Design Project (SWP) personnel have told CONST they could apply the full G-43 tolerance to the location shown on the support drawing, thus the support could be installed outside of the relocation tolerance. This condition was caused by the informal conveyance and acceptance of technical requirements between TVA's Division of Engineering Design (EN DES) and CONST personnel.

NCR 3730R R1

Supports were installed out of tolerance with respect to analysis point. Construction specification G-43 specifies that a support must be installed within tolerance with respect to the analysis point. Contrary to this, EN DES had previously instructed CONST to apply the tolerance to the design location (NCR WBN SWP 8148). Consequently, supports were installed out of construction specification G-43 tolerance with respect to both the design location and the analysis point. This is a site tracking NCR for EN DES NCRs WBN SWP 8108 and WBN SWP 8148 and is to be considered representative of a generic condition. Supports 63-1SIS-R104 and -R212 have specifically been identified as being representative of this condition.

Besides the site tracking function of this NCR, its primary purpose is to document the condition of the supports being installed outside of the acceptable relocation tolerance with respect to both the design location and the analysis point.

Safety Implications

Discrepancies between as-built and as-analyzed piping supports could invalidate the seismic analysis of various safety-related piping systems. Had this condition gone undetected, the safety of the plant may have been jeopardized by failure of safety-related piping during a seismic event.

Corrective Action

Discrepancies (support locations outside of the relocation tolerance) between as-built and as-analyzed support locations will be evaluated for impact on the seismic analysis. The method of resolving these discrepancies will be the determination of the location of "installed" supports for all analysis isometrics with a significant number of supports installed. These installed locations will be qualified by evaluation or reanalysis by the EN DES seismic analysis personnel or the support will be relocated within tolerance of the analysis point. This effort is described by Report CEB-81-30, "Program Plan - Field Inspection for Determination of As-Constructed Pipe Configuration and Location of Pipe Supports on Rigorously Analyzed Piping Systems." All EN DES actior required for the disposition of unit 1 supports is complete.

All rigorously analyzed piping support locations at Watts Bar Nuclear Plant not covered by the Report CEB-81-30 effort will be installed within the acceptable tolerances of the analysis point. All CONST rework required on unit 1 will be complete by December 1, 1983.

Actions Required to Prevent Recurrence

NCR WBN SWP 8108

The WBN Rigorous Analysis Handbook, Section 601, used by TVA's analysts requires rigorous analysis isometrics to be revised for all changed approved by the organization responsible for the analysis.

NCR WBN SWP 8148

The allowed relocation tolerances are in EN DES's Construction Specifications G-43 and N3C-912, and WBN Design Criteria Document WB-DC-40-31.9 and are mirrored in WBN CONST's Quality Control Procedure WBN-QCP 4.23-3. This assures conformity in EN DES's and CONST's programmatic application of relocation tolerances.

NCR 3730R R1

This NCR is primarily a tracking NCR documenting the discrepancies that occur due to the problems identified in the EN DES NCRs. Consequently, the actions required to prevent recurrences are addressed relative to the EN DES NCRs.

From a general standpoint, technical requirements are conveyed formally between EN DES and CONST as required by the QA Program Requirements Manual, Section 5QPR-1.

TVA will provide more information on Watts Bar unit 2 in our next report.