TENNESSEE VALLEY AUTHORITY
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400 Chestnut Street Tower II

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January 7, 1985

WBRD-50-390/84-47
WBRD-50-391/84-42

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - DESTRUCTION OF EDS SUPPORT DESIGN CALCULATIONS - WBRD-50-390/84-47, WBRD-50-391/84-42 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector P. E. Fredrickson on October 10, 1984 in accordance with 10 CFR 50.55(e) as NCR WBN CEB 8418. This was followed by our interim report dated November 6, 1984. Enclosed is our final report. A several week delay of this submittal was discussed with Inspector A. Ignatonis on January 3, 1985.

TVA does not now consider the subject nonconforming condition adverse to the safe operation of the plant. Therefore, we will amend our records to delete this nonconformance as a 10 CFR 50.55(e) item.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. W. Hufham, Manager
Licensing and Regulations

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
DESTRUCTION OF EDS SUPPORT DESIGN CALCULATIONS
NCR WBN CEB 8418
WBRD-50-390/84-47 AND WBRD-50-391/84-42
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

In resolving a concern that resulted from an independent review of the auxiliary feedwater system (Black and Veatch finding, F-327), TVA identified by nonconformance report (NCR) WBN SWP 8303 a deficiency concerning the lack of support calculations for many of the supports designed by EDS Nuclear, Incorporated, on safety-related systems in the Reactor Building. Sections 17.1A.17 and 17.2 of the Watts Bar FSAR establish TVA Topical Report TR75-1A as the governing document for the Watts Bar quality assurance program. TR75-1A refers to ANSI Standard N45.2.9-1974 for the types of records to be retained for the life of plant (LOP). This standard specifies that design calculations which would be of significant value in determining the cause of an accident or malfunction are records required to be retained LOP. Contrary to the requirements of this standard, TVA directed EDS to destroy their calculations for the EDS-designed supports. The only calculations retained were those associated with an EDS design review of its Watts Bar work.

No corrective action was deemed necessary for NCR WBN SWP 8303, and the NCR was closed on March 2, 1984. Subsequent to the NCR's closure, however, TVA determined it was necessary to perform a more detailed assessment to fully establish the technical adequacy of the supports for which we do not have design calculations. TVA's Office of Engineering (OE) generated this NCR to reopen the subject deficiency and to initiate a detailed assessment.

Safety Implications

The supports for which the calculations are missing were designed by EDS using their quality assurance program. Even though TVA does not have the calculations for these supports, we do have the following data: the input data from the piping analysis, the results of the final design in the form of hanger design drawings, and the independent review calculations that were developed by EDS for some of the supports. The final design drawings indicate they were checked against the design calculations and did go through a review and approval process. Also, the EDS quality assurance program was audited by TVA during the time the work was being done and was found to be satisfactory. Considering the above, it is TVA's position that the design and drawings for the supports were developed in accordance with an appropriate QA program.

The following discussion provides additional information which further verifies the technical adequacy of the supports, and is based on a design sampling program, previous evaluations, and investigation of a previous nonconforming condition.

SAMPLING PROGRAM

A sampling program was completed which consisted of randomly selecting 60 supports for which no calculations, or incomplete calculations, existed and verifying their adequacy by developing complete calculations for the supports. These supports were selected by using a random number table. The calculations that were developed evaluated the complete latest design criteria requirements for the supports and addressed such aspects of design as: deflection, stress, plate and anchor bolt capacity, capacity of standard components, design travel, and frequency checks. In addition, the capacity of the embedded plates to carry the support loads was also evaluated as necessary. The calculations demonstrate that all 60 supports meet design requirements and will perform their intended function.

PREVIOUS TECHNICAL EVALUATIONS

The TVA investigation revealed that the total number of EDS designed pipe supports consist of approximately 2780 supports for unit 1 and approximately 1340 supports for unit 2 (total of 4120). All unit 2 supports will be reviewed by TVA as part of that unit's design process and thus the acceptability of these supports will be ensured. Of the approximately 2780 unit 1 supports, TVA has partially reevaluated, modified, or totally redesigned approximately 2080 supports and, therefore, only approximately 700 supports (approximately 25 percent) had not been previously examined by TVA.

The EDS quality assurance program called for an independent review of their designs. An evaluation of the status of the review of the unit 1 designs reflects the following:

- Approximately 180 supports were assigned to TVA for verification and they have been reviewed and are acceptable to TVA.

- Approximately 1000 supports were reviewed by EDS by such means as catalog load rating, previous qualifications, engineering judgment, duplicate design, TVA design responsibility, etc.

- Approximately 900 supports were reviewed by EDS through independent calculations.

- Approximately 700 supports do not have available documentation to show review by EDS.

TVA re-reviewed the approximately 900 supports that were originally reviewed by EDS utilizing independent calculations and found 18 supports that had inadequate justification. TVA regenerated the design as necessary for these 18 supports and found them all to be acceptable as-is. It should be noted, however, that in the process of reviewing the EDS independent calculations, we did identify a need to further evaluate deflection requirements. Therefore, TVA verified the approximately 900 supports that were reviewed by EDS. The EDS reviewer had performed deflection checks on approximately 542 supports and these were found to be acceptable. Additionally, approximately 200 support did not require a deflection check due to the use of standard components. The remaining supports were reviewed by TVA and found to meet the deflection criteria. Thus, the supports meet deflection requirements.

INVESTIGATION OF PREVIOUS NCR

In addition, TVA has reviewed all the pipe supports for units 1 and 2, which included the EDS designed supports, for frequency and deflection requirements to ensure rigidity requirements were met as a result of a previously reported NCR WBN SWP 8319 (WBRD-50-390/83-14, WBRD-50-391/83-13). TVA identified 259 supports for units 1 and 2 that met the criteria identified by the NCR (which consisted of the first two supports, for 2-1/2-inch-diameter piping and larger, located adjacent to a rotating equipment nozzle). There were 182 pipe supports for unit 1 and 180 of these were found to meet deflection and frequency requirements. Two supports did not meet frequency requirements and have been revised to be acceptable. For unit 2, there were 77 supports identified under the above criteria. All of these supports were acceptable except one which did not meet frequency requirements. That support will be revised to be acceptable.

CONCLUSION

Thus, based on the results of our review of the EDS independent review calculations, our design sampling program and our investigation under NCR WBN SWP 8319, TVA concludes that the EDS supports will perform their intended function and that no safety concern exists regarding the lack of design calculations. As such, 10 CFR 50.55(e) no longer applies to this item. Since we have input loads and final design drawings, it is not necessary to reproduce calculations for the remaining unit 1 EDS designed supports.