TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

December 7, 1982

WBRD-50-390/81-36
WBRD-50-391/81-35

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - ANCHOR BOLTS NOT INSTALLED IN ACCORDANCE WITH SPACING SPECIFICATIONS - WBRD-50-390/81-36, WBRD-50-391/81-35 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on March 31, 1981 in accordance with 10 CFR 50.55(e) as NCR SWP 8106. Interim reports were submitted on April 30, May 21, June 4, September 16, and December 2, 1981 and January 29, April 13, May 24, July 28, and September 23, 1982. Enclosed is our final report.

As discussed in the enclosure, TVA has determined that the subject condition could not have adversely affected the safe operations of the plant; and thus does not represent a reportable item under the requirements of 10 CFR 50.55(e). Therefore, TVA will amend its records to delete the subject condition 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

D S 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. 20555

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
ANCHOR BOLTS NOT INSTALLED IN ACCORDANCE WITH SPACING SPECIFICATIONS
NCR WBN SWP 8106 R1
WBRD-50-390/81-36, WBRD-50-391/81-35
FINAL REPORT

Description of Condition

TVA drawing 47A050-17 was issued for construction allowing installation of expansion shell anchor bolts at spacings less than specified in General Construction Specification G-32 (G-32). Supports utilizing the reduced spacings for adjacent supports may not have an adequate factor of safety. The root cause was that the design standard DS-C6.1 did not specifically state that all adjacent tensile anchors be considered in an evaluation for reduced spacings.

Safety Implications

The completed design review of the anchor bolt spacings and the possible spacings to adjacent baseplates has shown that the factor of safety in each case would be conservative enough to assure that the safe operation of the plant would not be adversely affected.

Corrective Action

TVA has completed a review of the design of engineered support baseplates with spacings less than specified in G-32 revision 6. The results indicate that the factor of safety against concrete failure for all engineered support baseplates with less than G-32 spacing between anchors is greater than 4.

The factor of safety calculations also accounted for adjacent baseplates which could have been installed using the spacing criteria on 47A050-17. Eleven possible conditions were analyzed. Each condition represented a combination of two types of baseplates (for example, a 4-bolt engineered support installed next to a 2-bolt typical support). Each condition used the "worst case" loading for each support. All possible combinations of anchor sizes for each condition were analyzed.

The analysis shows that for all conditions, the factor of safety against concrete failure is greater than 4. Therefore, the anchors will be used as-is and no further evaluation will be performed.

To prevent a recurrence of this deficiency, drawing 47A050-17 was placed on hold as of May 20, 1981, and has now been deleted. In addition, design standard DS-C6.1 is being revised to emphasize the consideration of all adjacent tensile anchors in any evaluation of reduced spacing.