

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

USNRC REGION II  
ATLANTA, GEORGIA

March 31, 1983 APR 4 AIO: 43

WBRD-50-390/82-62, -391/82-59

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 - NONCONSERVATIVE CALCULATION METHOD  
FOR GENERAL CONSTRUCTION SPECIFICATION G-32 VIOLATIONS - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector D. Quick on May 28, 1982 in accordance with 10 CFR 50.55(e) as NCR WBN SWP 8208. Related NCR GEN CEB 8205 was also determined to be reportable under 10 CFR 50.55(e). Interim reports were submitted on July 2 and October 12, 1982. Enclosed is our final report for NCR WBN SWP 8208.

For disposition purposes, NCRs WBN SWP 8208 and GEN CEB 8205 are now being handled independently. Therefore, a separate report will be submitted for GEN CEB 8205.

If you have any questions concerning this matter, 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

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  
NONCONSERVATIVE CALCULATION METHOD  
FOR GENERAL CONSTRUCTION SPECIFICATION G-32 VIOLATIONS  
NCR WBN SWP 8208  
10 CFR 50.55(e)  
FINAL REPORT

### Description of Deficiency

When evaluating violations of the General Construction Specification G-32 (G-32), it was identified that some of TVA's Watts Bar Design Project personnel had been evaluating the effects of spacing between installed concrete anchors and embedded plates based on information obtained from concrete anchor manufacturers. TVA considers the manufacturer's calculation method to be unconservative, which resulted in factors of safety less than the allowables in G-32 and Design Standard DS-C6.1 (DS-C6.1). The cause of this deficiency was the failure of the design personnel to follow the requirements of DS-C6.1 concerning anchor spacing computations.

### Safety Implications

While the random samples of 60 in-place expansion anchors spaced closer to embedded plates than allowed by G-32 showed all the samples to be acceptable, this spacing deficiency, had it remained uncorrected, could have allowed additional anchors for safety-related piping to be placed such that their proximity to the embedded plates could result in anchor strengths less than those designed. This could affect safe operation of the plant as reduced anchor strengths could allow the support to fail.

### Corrective Action

In lieu of reviewing the calculations to determine when the nonconservative method was used, a random sample was selected of in-place expansion anchors which were spaced closer to embedded plates than allowed by G-32. Sixty occurrences of reduced spacing were analyzed and all 60 were found to be acceptable, which is well within the 5-percent failure rate and 95-percent confidence level specified as acceptable in OIE Bulletin 77-02, revision 2. Therefore, the use of the nonconservative method did not have a statistically significant effect on the acceptability of the in-place anchors. In addition, review by TVA has shown that this problem existed only at Watts Bar and no other TVA plant is affected.

To prevent a recurrence of this situation, designers have been referred to DS-C6.1 both by memorandum and by meeting, and a formal design procedure has been established in volume 3, section 7.14 of the Watts Bar Pipe Design Manual.