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

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May 11, 1982

WBRD-50-390/82-33
WBRD-50-391/82-30

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 - SHEET PILE RETAINING WALL AT THE ERCW INTAKE PUMPING STATION - WBRD-50-390/82-33, WBRD-50-391/82-30 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on March 25, 1982 in accordance with 10 CFR 50.55(e) as NCR WBN CDB 8201. Enclosed is our final report. The submittal date of this report was discussed with Inspectors R. V. Crlenjak and D. Quick on April 21 and May 3, 1982, respectively.

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, Manager
Nuclear Licensing

Enclosure
cc: Mr. Richard C. DeYoung, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2

SHEET PILE RETAINING WALL AT THE ERCW INTAKE PUMPING STATION

NCR WBN CDB 8201

WBRD-50-390/82-33, WBRD-50-391/82-30

10 CFR 50.55(e)

FINAL REPORT

Description of Deficiency

While investigating an NRC question on factors of safety for the sheet pile retaining wall at the ERCW intake pumping station (drawings 31N224-1R5 and -2R1), TVA discovered errors in the final design calculations. These errors consisted of (1) the omission of a factor for the SSE loads applied to the concrete deadman and (2) the incorrect application of a formula for computing the bending stress in the plates at the wale.

The first error occurred when the SSE loads were factored by dividing by yield over allowable. The resulting loads were compared directly with the normal case to find which case controlled the design. When designing the members controlled by the SSE case, the factor (1.63) for SSE loads was not removed.

These errors were missed during the checking process performed in 1973 and 1974 and are considered as an isolated incident.

Safety Implications

The first error has no safety implications. Using existing soil parameters as shown in revised design criteria, TVA has determined the anchorage system has an adequate factor of safety (1.12) against sliding.

The second error resulted in plates in the sheet pile retaining wall at the ERCW intake pumping station being overstressed in bending. The factor of safety has been determined to be less than one, thus indicating the possibility of plate yielding during a seismic event. This condition could have adverse effects on the safe operations of the plant.

Corrective Action

For the first error, a new earth passive pressure factor was calculated using existing backfill and a design guide for computing pressures. This resulted in changes to the design criteria (WB-DC-20-19R5). These changes will be completed by June 18, 1982.

The plates in the second condition at the wales will be reinforced for bending by welding two steel bars on the plate. This will provide a minimum safety factor for plate bending during SSE condition. This will be done as an additional safeguard since due to configuration of the connection at the plates, the failure mechanism has been determined to be shear, not bending. The plate is adequate for shear. The associated drawing (31N224-2R2) and field modifications will be completed by August 13, 1982.

Engineering procedures concerning design calculations (EN DES-EP 3.03R5) in effect at this time will aid in preventing this type discrepancy in the future. The original issue of this EP is dated August 22, 1974, after the errors were made.