

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37402  
400 Chestnut Street Tower II  
Atlanta, Ga.

May 4 1983  
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WBRD-50-390/81-59  
WBRD-50-391/81-55

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:

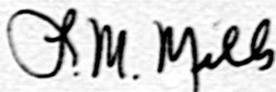
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - ROCK SUPPORTED STRUCTURES  
DIFFERENTIAL SETTLEMENT - WBRD-50-390/81-59, WBRD-50-391/81-55 -  
SEVENTH INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on July 7, 1981 in accordance with 10 CFR 50.55(e) as NCR WBN CEB 8108. Interim reports were submitted on August 6 and November 9, 1981 and March 15, May 17, June 29, and October 5, 1982. Enclosed is our seventh interim report. We expect to submit our next report on or about September 22, 1983.

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, 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  
ROCK SUPPORTED STRUCTURES DIFFERENTIAL SETTLEMENT  
NCR WBN CEB 8108  
WBRD-50-390/81-59, WBRD-50-391/81-55  
10 CFR 50.55(e)  
SEVENTH INTERIM REPORT

### Description of Deficiency

During a recent review of Watts Bar Commitment item No. WBN-SER-003, which states that "The foundations (of Category I rock supported structures) will be designed to behave independently under the specified loads and accommodate 1 inch differential settlements," TVA discovered that there was no documentation or evidence of completion of this commitment. The Preliminary Safety Analysis Report, Final Safety Analysis Report, and NRC's draft Safety Evaluation Report state that the rock supported structures will be designed for a 1 inch differential settlement, but this 1 inch differential settlement criterion is not given in any of the Design Criteria except for one concerning water stops between buildings. Apparently at that time, this type of information was not placed in Design Criteria but was sent by an internal TVA memorandum. This memorandum has been identified as F. P. Lacy to J. W. Smith dated March 5, 1971, WBNP - Foundation Characteristics and Expected Settlement.

This condition represents a potential deficiency in the final design since there is no evidence that the requirements of the memorandum were satisfied and since issued Design Criteria did not state that the foundations (of Category I rock supported structures) would be designed to behave independently under the specified loads and accommodate 1 inch differential settlements as required. Also, as a result, there are apparently no Design Criteria that have this requirement for the design of adjacent rock supported structures, or for the design of electrical conduits or piping between adjacent Category I structures.

### Interim Progress

Detailed design criteria for safety-related cable trays and for safety-related HVAC ducts have been completed as have the evaluation of these two systems. No problems were encountered or modifications required for either of the systems.

The design criteria for safety-related piping, electrical conduits, and instrumentation lines are being prepared. The qualification for these systems will be performed in two phases. Phase 1 will be to ensure that the differential settlement that has occurred up to the current time has not caused excessive loads on any component of these systems. Where required, field modifications or adjustments will be prescribed such that all interconnecting components are qualified with respect to the differential settlement. Phase 2 will be to use potential future differential settlement data to evaluate component integrity under the postulated conditions. Depending upon the evaluation results field modifications or adjustments, if required, will be prescribed such that all interconnecting components are qualified with respect to the differential settlement.

The design of the instrumentation for monitoring future differential settlement has been completed. The locations for installing these monitoring devices have been determined and are shown in engineering change notice (ECN) 3833.

This settlement condition is not a generic problem with other nuclear plants. It is a result of the type of rock foundation at the Watts Bar site only. Therefore, no specific measures need to be taken to prevent a reoccurrence with respect to the foundation conditions.

Additional information will be provided in our next report.