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

USNRC REGION II
ATLANTA, GEORGIA
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May 17, 1982

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, Suite 3100
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, - FOURTH 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, 1982. Enclosed is our fourth interim report. We expect to submit our next report by July 9, 1982.

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

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

The subject NCR concerns the noncompliance to criteria that requires the differential settlement of adjacent rock-supported structures to be considered in the design of piping, conduit, instrumentation lines, etc.

Because differential settlement was not considered for interconnecting systems between adjacent rock-supported structures it became necessary to:

1. Analyze the measured differential settlements to determine dates for which interconnecting systems were subjected to differential settlements.

2. Determine potential future differential settlement.

The surveys for determining the settlement of rock-supported structures were discontinued when the data indicated that the structures had stabilized. In order to obtain current data on the settlement of these structures, a series of three surveys was planned to determine their present position. These surveys have been completed. The analysis of the measurements has also been completed. The results are being used to determine if any of the differential settlements exceed the allowable or tolerable differential movement for any of the interconnecting systems. The potential future differential settlement for these systems is being considered.

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