

TENNESSEE VALLEY AUTHORITY REGION II  
ATLANTA, GEORGIA  
CHATTANOOGA, TENNESSEE 37407

400 Chestnut Street Tower II

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October 21, 1981

WBRL-50-390/81-58  
WBRL-50-391/81-54

Mr. James P. O'Reilly, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Region II - Suite 3100  
101 Marietta Street  
Atlanta, Georgia 30303



Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - IMPROPER ANCHOR INSTALLATION -  
WBRL-50-390/81-58, WBRL-50-391/81-54 - SECOND INTERIM REPORT

The subject deficiency was initially reported to NRC-OIR Inspector R. V. Crlenjak on June 24, 1981 in accordance with 10 CFR 50.55(e) as NCR 3289R. Our first interim report was submitted on July 31, 1981. Enclosed is our second interim report which contains an expanded description of conditions. We expect to submit our next report by March 1, 1982.

If you have any questions, please get in touch with R. J. Shell at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*L. M. Mills*  
L. M. Mills, Manager  
Nuclear Regulation and Safety

Enclosure

cc: Mr. Victor Stello, 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  
IMPROPER ANCHOR INSTALLATION  
WBRO-50-390/81-58, WBRO-50-391/81-54  
10 CFR 50.55(e)  
SECOND INTERIM REPORT

Description of Deficiency

TVA General Construction Specification No. G-32 required that qualification tests be performed at the project on all sizes and brands of expansion anchors to be used on a project. The qualification requirements were added to G-32 in revision 5 dated July 1977. Qualification tests were not performed at that time because anchor installation had been in progress for several years and the revision was not retroactive.

In December 1979, the construction project was requested by the Division of Engineering Design (ED DFS) to perform qualification tests on expansion anchors. The tests were performed as part of the resolution to NRC-OIE Bulletin 79-02. The tests were performed in September 1980. All sizes of Phillips self-drilling anchors (snap-off type), except the 3/8 inch, met the qualification requirements. However, the tests on 3/8-inch anchors were never reported. The NCR was written in May 1981 when the oversight was discovered.

In June 1981, additional qualification tests were performed on 3/8-inch anchors installed in in-place concrete. The anchors developed only 7 percent of the required ultimate tensile capacity.

Since submittal of our first interim report, TVA has identified the following additional problems relating to qualification of expansion anchors:

1. The additional qualification tests on the 3/8-inch self-drilling anchors which did not meet requirements were performed in in-place concrete with a specified strength of 3000 psi at 90 days. The acceptable qualification tests on other sizes were performed in concrete with a specified strength of 4000 psi at 28 days. All qualified sizes may not be acceptable in the lower strength concrete.
2. Several sizes of unqualified Bulldog self-drilling anchors were installed and the anchor installation was not in accordance with the manufacturer's recommendations.
3. Several sizes of unqualified Phillips self-drilling anchors (flush type) were used. The flush type differs slightly from the snap-off types.
4. Several sizes and brands of nondrilling expansion shell anchors were installed. This type of anchor is not equivalent to the specified self-drilling anchors.
5. Several sizes of unqualified Hilti Kwik-bolt wedge anchors were installed.

Interim Progress

For the shell type anchors (including 3/8-inch, Bulldog, and Phillips self-drilling anchors and the nondrilling expansion shell anchors), a thorough review of the reports for random proof load testing of regularly installed anchors has been initiated to determine if the failure rates are acceptable. For the Hilti Kwik-bolt wedge bolts, additional information is being obtained from the field.