TENNESSEE VALLEY AUTHORITY
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USNRC REGION II
ATLANTA, GEORGIA
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November 20, 1981

WBRD-50-390/81-03
WBRD-50-391/81-03

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 - NONRANDOM TESTING OF EXPANSION ANCHOR BOLTS - WBRD-50-390/81-03, WBRD-50-391/81-03 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector M. Thomas on December 12, 1980, in accordance with 10 CFR 50.55(e) as NCR's 2803R and 2873R. Interim reports were submitted on January 12, March 23, June 10, July 15, and September 24, 1981. Enclosed is our final report.

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 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
NONRANDOM TESTING OF EXPANSION ANCHOR BOLTS
WBRD-50-390/81-03, WBRD-50-391/81-03
10 CFR 50.55(e)
FINAL REPORT

Description of the Deficiency

As a result of a program implemented to resolve NCR 2019R, Seismic Pipe Supports, TVA has identified instances where previously performed and documented inspections of expansion anchors for seismic pipe supports have failed to comply with requirements specified in General Construction Specification G-32 (G-32), "Bolt Anchors Set in Hardened Concrete." These instances are identified in NCR's 2803R and 2873R.

G-32 specifies that a specific number of expansion anchors will be randomly chosen and tested from within a lot after installation of the lot. A lot is defined as those expansion anchors installed by a specific crew either in a specific location in the plant or over a period of time not to exceed two weeks. Contrary to the above, NCR 2803R identified lots in which expansion anchors were not randomly chosen for testing and failed to meet the location or time requirements specified in G-32. In addition, NCR 2873R identified expansion anchors which were not included within a lot as required by G-32.

Safety Implications

Failure to properly test expansion anchors for seismic pipe supports could result in the failure of a safety system during a design base event.

Interim Progress

TVA has completed an NRC-OIE Bulletin 79-02 type inspection for each of the affected groups of anchors to determine if the violation of G-32 resulted in the installation of anchors that would not meet their maximum design loads. The requirement given in NRC-OIE Bulletin 79-02 is a 95-percent confidence level that less than 5-percent defective anchors are installed in any one Category I system. The results of each inspection have been evaluated, and anchors that did not meet the G-32 pull test requirements were considered structurally unacceptable and replaced.

Since the failure rate for the anchors was much less than required by NRC Bulletin 79-02, the anchors cited in the NCR (which were not replaced) will be used as installed.

The following table gives the NCR number with which each nonconforming group of anchors was identified, the type and number of affected anchors inspected, the number found to be deficient by pull testing, and the percentage that this number represents.

NCR	Anchors Number	Anchors Type	Deficient	%
2873R	281	Expansion	1	0.36
2803R	127	Expansion (unit 1 and common)	2	1.6
2803R	123	Expansion (unit 2)	0	0.00

Lot M-86 (included in NCR 2803R) was previously identified on NCR 1956R (nonsignificant NCR) as having cut anchor shells. The disposition for the nonconformance identified in Lot M-86 was to proof test all anchors in accordance with G-32. Approximately 75 percent of Lot M-86 has been proof tested. TVA will inspect the remaining anchors in Lot M-86 using a 79-02 type inspection (to identify the cut anchors), except for the remaining 1/2-inch anchors. All remaining 1/2-inch anchors will be listed and pull tested. All defective anchors will be replaced by December 31, 1981.

In order to prevent recurrence of this type of problem, TVA has organized a Hanger Engineering Unit at the WBN site with responsibility for the installation and inspection of seismic pipe supports. This unit has issued WBNP-QCP-4.23, "Installation Inspection and Documentation Requirements for Seismic Supports." WBNP-QCP-4.23 outlines a program which will ensure that all expansion anchors for seismic pipe supports are selected and tested according to the requirements of G-32. Craft and inspection personnel associated with seismic pipe supports have been reinstructed in the requirements of WBNP-QCP-4.23 and G-32.