

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

USNRC REGION II

ATLANTA, GEORGIA

June 24, 1983 JUN 27 P 1:11

WBRD-50-390/82-58

WBRD-50-391/82-55

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 - CONCRETE ANCHORAGE FREE EDGE
VIOLATION - WBRD-50-390/82-58, WBRD-50-391/82-55 - FOURTH INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector D. Quick on May 28, 1982 in accordance with 10 CFR 50.55(e) as NCR 4068R R1. Interim reports were submitted on June 24 and October 26, 1982 and February 3, 1983. Enclosed is our fourth interim report. We expect to submit our next report on or about September 19, 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

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
CONCRETE ANCHORAGE FREE EDGE VIOLATION
NCR 4068R R1
WBRD-50-390/82-58, WBRD-50-391/82-55
10 CFR 50.55(e)
FOURTH INTERIM REPORT

Description of Deficiency

The subject deficiency involves expansion bolt anchors for supports of various systems having been installed too close to concrete free edges. These bolt anchors are attached to nonload bearing walls and are, in some instances, installed in grout instead of concrete. Grout has little or no resistance to anchor pullout. Other bolt anchors are installed in these walls with less than ten nominal bolt diameters from the concrete edge. This violates the requirements of TVA Construction Specification G-32 which specifies a minimum distance of ten nominal bolt diameters unless otherwise approved by the design engineer. The tension and shear capacities of bolt anchors can be significantly reduced when anchors are installed near concrete free edges.

There are several walls in the auxiliary building and control building which contain unreinforced construction joints and/or gaps as part of their design. These discontinuities are not always readily apparent. They must, however, be considered free edges for the purpose of bolt anchor installation. They occur mainly in nonload bearing (partition and shield) walls and fall into two categories--horizontal and vertical.

The horizontal gaps occur where partition and shield walls intersect the ceiling. These walls were designed with a two-inch space at the top so that the ceiling above will not bear directly upon them. The two-inch gap is obscured by a narrow mortar joint which was placed to prevent air flow. Since the mortar joint is not designed to transmit load, the joint must be considered a free edge. This circumstance occurs on all shield and partition walls in the control and auxiliary buildings. Specifically these show up on the following concrete drawing series: 41N366, 368, 370, 372, 373, and 391 in the auxiliary building and 41N483 in the control building.

The unreinforced vertical construction joints occur where partition and shield walls intersect columns or structural walls. These circumstances occur in the same nonload bearing walls described above and are shown on the same drawing series listed above.

The perimeter walls of these buildings as well as the "C3" and C11" walls in the control building; the "A5," "A11," "U," "X," and "Y" in the auxiliary building and various other structural walls are not subject to these problems.

The apparent cause of this deficiency is that free edges were not discernible at the time of installation and inspection of the bolt anchors.

Interim Progress

Evaluations have been performed and completed on the edge distance violations for the bolts that were identified from the field survey. One hundred and nineteen supports require some type of rework out of a total number of 477 supports that were identified as having an edge distance violation. The following guidelines were used in arriving at the number to be reworked.

1. No bolt anchors with edge distances less than three nominal bolt diameters from the concrete edge, including those installed in a joint will be accepted. (Although G-32 does require ten nominal bolt diameters for a minimum distance, less may be accepted if first approved by the design engineer. However, never less than three diameters may be accepted.
2. Accept no plates that bridge or span across a joint.
3. Maintain a factor of safety of at least five when evaluating tension/shear capacities of anchors near joints.

Ninety-nine supports require some type of redesign and/or rework by TVA's Division of Construction (CONST) to alleviate the G-32 violations. The remaining 20 supports will be revised and issued on TVA's Division of Engineering Design (EN DES) drawings per engineering change notice (ECN) 3786 (unit 1) and ECN 3853 (unit 2).