

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

January 15, 1986

WBRD-50-391/82-24

WBRD-50-391/82-20

U.S. Nuclear Regulatory Commission
Region II

Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNIT 2 - DISCREPANCIES IN SUPPORT DETAILS -
WBRD-50-391/82-24, WBRD-50-391/82-20 - FINAL REPORT

In accordance with the requirements of 10 CFR 50.55(e) NCR WBN SWP 8204 (WBRD-50-390/82-27, WBRD-50-391/82-24) was initially reported to NRC-OIE Inspector R. V. Crlenjak on March 2, 1982. Interim reports were submitted on March 31, and September 22, 1982, and January 13, and April 13, 1983.

NCR WBN SWP 8315 (WBRD-50-390/83-22, WBRD-50-391/83-20) was initially reported to NRC-OIE Inspector R. Butcher on March 11, 1983. This deficiency was determined to be part of the overall Watts Bar alternate analysis programmatic deficiency and therefore was addressed in the April 27, 1983 submittal on that deficiency.

NRC-OIE Inspector L. Watson was notified on July 27, 1983 that because of their similarity and for reporting purposes the subject nonconformances were being combined. Our final report for unit 1 and fifth interim report for unit 2 was submitted on September 30, 1983. Our sixth interim report for unit 2 was submitted on June 19, 1984. Enclosed is our final report for unit 2.

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

J. A. Domer
Manager of Licensing

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PDR ADOCK 05000391
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Enclosure

cc: Mr. James Taylor, 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 UNIT 2
DISCREPANCIES IN SUPPORT DETAILS
WBRO-50-391/82-24, WBRO-50-391/82-20
NCRs WBN SWP 8204 AND WBN SWP 8315
10 CFR 50.55(e)
FINAL REPORT

NCR WBN SWP 8204

Description of Deficiency

On the fire protection system drawing series 47A491 and 47A492, TVA has identified the following discrepancies in the support detail drawings:

1. The installation locations of washers called for in the bill of material to be used with the unistrut clamps are not specified on the support detail nor is the term "unistrut assembly" defined on the bill of material as to its components.
2. While support drawings specify three-directional loads, in some instances washers have been located under unistrut clamps eliminating the axial restraint, and in other areas U-bolts, which should be used for tension loads only, are being used for these three-directional loads.
3. Lugs are missing on vertical pipe requiring an axial restraint for the "y" direction (or uploading) on the pipe.
4. Analysis loads shown on the support drawings do not agree with the loads as shown in the tables of the Watts Bar Nuclear Plant (WBN) alternate analysis criteria (Civil Engineering Branch (CEB) 76-5).

NCR WBN SWP 8315

Description of Deficiency

Support detail discrepancies have been found on the support drawing series 47A491 and 47A492 for the raw service water, service air, primary makeup water, and demineralized water piping systems. The following discrepancies were identified.

1. Incorrect use of component parts and materials in design of the supports as shown on support design drawings.
2. Disagreement between the loads used on support design drawings and the loads used on the WBN Alternate Analysis Criteria CEB 76-5.

The apparent cause for the discrepancies in both nonconformance reports (NCRs) are inadvertent detail errors by TVA design engineers, lack of knowledge and understanding of the WBN Alternate Analysis Criteria, and inadequate review of support drawings by checkers.

Safety Implications

During a seismic event, the piping on the fire protection, raw service water, service air, primary makeup water, and demineralized water system could become overstressed due to possible greater loadings on the piping than allowed for in design. These excessive loadings could cause a pipe rupture in piping areas where safety-related electrical equipment is located. Failure of the safety-related electrical equipment is located. Failure of the safety-related electrical equipment to function properly (as a result of water spray from the ruptured piping system) when required to do so could adversely affect the safe operation of the plant.

Corrective Action

In order to verify the adequacy of the piping and support loads, a 100-percent review of the piping analysis and associated support designs has been performed on the high pressure fire protection, raw service water, service air, primary makeup water, and demineralized water piping systems. In most cases, a completely new analysis was performed and documented using computer analysis techniques instead of using alternate analysis methods. Then, each existing pipe support drawing was reviewed for adequacy with respect to the relevant piping analysis and to the requirements of the WBN pipe support design manual which describes in detail the correct usage of every type of component standard hardware item which is available at WBN. Necessary modifications were then completed through engineering change notices (ECNs) 4303, 4305, 3859, and 4858.

As described in the final report for unit 1, to prevent recurrence of this deficiency, each affected support designer and checker has been trained in the use, and provided a copy of, the WBN Pipe Support Design Manual (PSDM). The WBN PSDM is a four volume instructional manual prepared specifically for WBN. This manual describes in detail the correct use of every type of component standard hardware item which is available at WBN. Additionally, all affected personnel have been trained in appropriate procedures to emphasize the responsibilities of a checker and to emphasize the requirement of independency of the checker/reviewer.