

**TENNESSEE VALLEY AUTHORITY**

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

March 8, 1982

USNRC REGION II  
ATLANTA, GEORGIA  
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WBRD-50-390/81-40

WBRD-50-391/81-39

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 - VALVE MODELING ERROR  
- WBRD-50-390/81-40, WBRD-50-391/81-39 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on April 10, 1981 in accordance with 10 CFR 50.55(e) as NCR CEB 8106. Interim reports were submitted on May 11, August 18, September 23, and December 2, 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. 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  
VALVE MODELING ERROR  
WBRD-50-390/81-40, WBRD-50-391/81-39  
10 CFR 50.55(e)  
FINAL REPORT

Description of Deficiency

The analytical model of valve 19 (valve drawing 20093) in piping problem N3-67-2A was incorrect. The model did not represent the actual valve design because it did not include the valve center of gravity. The modeling of the valve center of gravity could change the frequency of the piping system. This change in frequency could increase the present stress results. The change in frequency could also increase the valve accelerations.

The valve is used in the Essential Raw Cooling Water (ERCW) System. It regulates the flow of ERCW to the shutdown board room air conditioner condensers.

It is difficult to determine the exact cause of the analysis error. The original analysis (9/76) contained an estimated valve weight and an assumed in-line center of gravity. This data was preliminary in nature and not based upon a specific valve to be purchased for this location within the piping analysis (N3-67-2A).

On 11/20/79 a specific valve drawing was issued for this location. The subject valve (valve 19) required a model change to accommodate a new center of gravity as shown on drawing 20093-1, contract 79KJ1-824662. However, later reanalysis of the piping analysis problem on 4/17/80, revision 4, and 1/22/81, revision 5, did not include this change.

The error results from either of the following:

1. The valve drawing was not accessible to the analyst at the time of this reanalysis.
2. The drawing was accessible but the analyst failed to include the new data in his analytical model.

Safety Implications

Incorrect modeling of the valve may result in an unconservative evaluation of the accelerations and stress imposed upon the valve. If, indeed, the loading is high enough to damage the valve, it could impede system operability. It could also lead to the loss of cooling water to the shutdown board room air conditioner condensers resulting in the loss of environmental control of the shutdown board room. This could result in degradation or loss of a shutdown board due to harsh environmental conditions. Therefore, this could adversely affect the safety of the plant.

Corrective Action

To prevent this error from recurring we have taken action on the two possible causes listed above.

1. Two reports, "The Watts Bar Miscellaneous Valves Master Status Report RPT009" and "The Instrumentation Valves Construction Status Report RPT010" have been modified to provide a cross reference listing between valve tag numbers, material mark numbers, contract numbers, and the manufacturer's drawing number.
2. We have instructed the piping analysts to be thorough in collecting and reviewing the data needed to properly model the analysis problem. As a part of this instruction they have been asked to make sure they have the current valve drawings.

TVA has reanalyzed this piping problem (N3-67-2A) with the correct valve modeling. Approximately 20 support changes are required. This will be completed before fuel loading of unit 1.