

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

December 11, 1981 A 8:33  
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WBRD-50-390/81-41  
WBRD-50-391/81-40

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 - ERCW HEAT TRACING -  
WBRD-50-390/81-41 AND WBRD-50-391/81-40 - FOURTH INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on April 13, 1981, in accordance with 10 CFR 50.55(e) as NCR WBN MEB 8104. Interim reports were submitted on May 13, September 3, and October 30, 1981. Enclosed is our fourth interim report. We expect to provide additional information by March 17, 1982.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

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

Enclosure

cc: Mr. Richard C. DeYoung, Director  
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  
ERCW HEAT TRACING  
WBRD-50-390/81-41, WBRD-50-391/81-40  
10 CFR 50.55(e)  
FOURTH INTERIM REPORT

Description of Deficiency

This deficiency was discovered during a routine NRC-OIE site inspection and subsequently identified as Level IV Violation 390,391/81-03-01. The inspector noted that the ERCW pump motor bearing cooling water line freeze protection system was outside the TVA QA program, whereas the ERCW pumps were safety-related. Subsequent investigation by TVA indicated a further discrepancy in that TVA drawing No. 37W206-51 required Class 1E electrical heat tracing in this region, while drawing No. 47W760-230 showed that neither the power supply nor the annunciators for this heat tracing are Class 1E. Furthermore, Construction Specification N3G-881 did not specify QC installation requirements applicable to Class 1E circuits. At this point, TVA wrote this nonconformance report.

Construction Specification N3G-881 was originally issued in August 1977 and did specify QA requirements for the heat trace system. However, revision 1 to this specification was issued in March 1978, and removed all QA requirements. The TVA evaluation before issuance of revision 1 of N3G-881 assumed that at least two ERCW pumps per train would be operating at all times, thereby precluding freezing in the operating pumps. Since two pumps on one train were sufficient to safely shutdown the two units or control an accident, freezing in the standby pumps would not have jeopardized safety. However, the system operating instructions did not actually require two pumps to be operating on each train, thereby invalidating this evaluation.

Drawing No. 37W206-51 was originally issued in September 1978, and did specify Class 1E heat tracing in certain areas of the intake pumping station. However, this drawing was used solely to define the amount of required heat tracing for procurement purposes. Since this drawing showed primarily mechanical features, it was not coordinated with the electrical group responsible for heat trace design. Drawing No. 45W760-234 was originally issued in December 1979. Since this drawing showed only electrical features, it was not coordinated with the mechanical group.

Interim Progress

To preclude potential freezing of the ERCW pump motor bearing cooling water lines, these lines will be rerouted under ECN 2756 to make them self-draining. The motor bearing cooling coils themselves are already self-draining.

TVA has analyzed the large-diameter ERCW pump discharge lines and found that 1 to 2 inches of ice could accumulate during freezing conditions if the heat trace system should be inoperative. This represents only about 28 percent of the combined internal volume of the two strainers associated with each train. If the ice broke away from the pipe walls and were ingested into the strainers, it would likely initiate automatic backwashing, thereby expelling much of the ingested ice through the backwash lines. Any remaining ice would be melted by the strainer flow. Therefore, in TVA's judgment, this would not pose a safety hazard and no design charges are proposed.

This nonconformance will be resolved by removing the Class 1E requirement from mechanical drawing 37W206-51. Such nonconformances will be avoided in the future by removing all electrical system specifications from mechanical piping drawings and by developing a design guide for heat trace systems.

Implications for other safety-related systems utilizing heat tracing, as well as for other TVA nuclear plants, will be discussed in a future report.