TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

September 7, 1982

WBRD-50-390/81-41
WBRD-50-391/81-40

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 - INADEQUATE FREEZE PROTECTION - WBRD-50-390/81-41 AND WBRD-50-391/81-40 - SEVENTH 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, October 30, and December 11, 1981 and March 16 and May 28, 1982. Enclosed is our seventh interim report. The title of this item has been modified to more accurately describe the scope of this 50.55(e) report. We expect to provide additional information by May 20, 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, Manager
Nuclear Licensing

Enclosure
cc: Mr. Richard C. DeYoung, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

OFFICIAL COPY

IE 27

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
INADEQUATE FREEZE PROTECTION
NCR WBN MEB 8104
WBRD-50-390/81-41, WBRD-50-391/81-40
10 CFR 50.55(e)
SEVENTH 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.

Subsequent TVA investigations into freeze protection for other systems have identified one group of safety-related equipment which may not be adequately protected. This equipment is feedwater flow element sensing lines in the main feedwater system.

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 changes 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.

TVA is developing a project procedure for the heat tracing and insulation of safety-related systems. The procedure will require a review of the heat trace and insulation requirements of the system. Subsequent to the review, design drawings will be issued and controlled to define the heat trace and insulation requirements.

TVA is still investigating the inadequate freeze protection for the feedwater flow element sensing lines in the main feedwater system. More information on this will be provided in our next report.