TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
5N 157B Lookout Place

February 10, 1986

WBRD-50-391/84-13

U.S. Nuclear Regulatory Commission
Region II
Attention: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNIT 2 - MOISTURE INTRUSION INTO SAFETY-RELATED EQUIPMENT - NUREG-0588 - WBRD-50-391/84-13 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Austin Hardin on February 29, 1984 in accordance with 10 CFR 50.55(e) as NCR WBN EEB 8405. Enclosed is our final report for unit 2.

Janice Kirby was notified of our delay in submitting this report on January 31, 1986.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. L. Gridley
Manager of Licensing

cc: Mr. James Taylor, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 2
MOISTURE INTRUSION INTO SAFETY-RELATED EQUIPMENT - NUREG-0588
WBRD 50 391/84-13
NCR WBN EEB 8405
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

In harsh environments, qualification of class 1E NAMCO limit switches, Target Rock solenoid valves, Rosemount level transmitters, and RDF Corporation RTDs is contingent on the user taking appropriate measures to prevent moisture instrusion during accident conditions. Inside primary containment, the conduit systems (including rigid and flexible conduit, conduit boxes, and fittings) for class 1E cables are continuous (closed) from the boxes at primary containment penetrations to the housings of the electrical class 1E devices and are designed to the equivalent of NEMA 4 "watertight" standards. However, for certain class 1E devices that are necessary to achieve accident mitigation and safe shutdown, there is no seal provided for these devices, and there is no documentation available to show that moisture intrusion is not a problem without a seal installed in the device. Sealing requirements for certain pieces of equipment required to be qualified in accordance with 10 CFR 50.49 were not met due to TVA's failure to incorporate these requirements into design documents.

Safety Implications

Moisture intrusion could potentially affect the operability of the subject devices during a postulated accident. This could have caused the failure of safety-related equipment to function as required, or caused erroneous indication of essential parameters on main control room indications thus misleading the operator. Therefore, the safe shutdown of the plant could have been subsequently adversely affected if this condition had remained uncorrected.

Corrective Action

As previously identified in TVA's final report on this condition for unit 1 (reference L. M. Mills' letter to J. P. O'Reilly dated July 24, 1984), TVA had used calculations MEB WBN EEB 8405, TI-ANL 144, and its 10 CFR 50.49 list to identify those devices which had to have the conduit entry sealed for safe operation of the plant. TVA then applied this information to the same devices on unit 2 and has issued design instructions through engineering change notices (ECNs) 5308, 5609, and 5639 for sealing these devices. Work on identifying additional unit 2 devices is continuing and design changes needed for sealing any remaining unit 2 devices will be made through ECN 5640. The work at the site to seal all identified devices will be completed by unit 2 fuel load.

As stated in our final report on unit 1, greater emphasis was placed on the training of all TVA designers and checkers to verify that design interface requirements of TVA-approved test reports or vendor documents for qualified equipment have been incorporated into TVA design documents as required by the then current Office of Engineering (OE) Engineering Procedure (EP) 3.10, "Design Verification Methods and Performance of Design Verifications." Continuity for these actions has been maintained per the current Office of Engineering Procedure (OEP), OEP-10, "Review."