

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401  
400 Chestnut Street Tower II

WB RD-50-390/84-13  
WB RD-50-391/84-13

05 MAR 7 P 11:14, 1985

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 UNITS 1 AND 2 - MOISTURE INTRUSION INTO SAFETY-RELATED EQUIPMENT - NUREG-0588 - WB RD-50-390/84-13, WB RD-50-391/84-13 - SUPPLEMENTAL FINAL REPORT FOR UNIT 1 AND FOURTH INTERIM REPORT FOR UNIT 2

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. Interim reports were submitted on March 29, May 23, and July 27, 1984. Enclosed is our supplemental final report for unit 1 and fourth interim report for unit 2. We expect to submit our next report for unit 2 on or about January 31, 1986.

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. Hufham*  
for J. W. Hufham, Manager  
Licensing and Regulations

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 UNITS 1 AND 2  
MOISTURE INTRUSION INTO SAFETY-RELATED EQUIPMENT - NUREG-0588  
NCR WBN EEB 8405  
WBRD-50-390/84-13 AND WBRD-50-391/84-13  
10 CFR 50.55(e)  
FINAL REPORT FOR UNIT 1 AND THIRD INTERIM REPORT FOR UNIT 2

### 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 intrusion 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 housing of the electrical class 1E devices and are designed to be equivalent 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 or 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 - Unit 1

A has established the harsh environment areas inside the plant that result in condensation or moisture intrusion inside conduits during a design basis accident. TVA then identified those devices which had to have the conduit entry sealed for safe operation of the plant. Engineering change notices (ECN) 4310 and 5142 have been issued to WBN Construction to seal these devices, panels, and junction boxes for WBN unit 1 by March 1, 1985. Before plant criticality, it is acceptable to have the devices, junction boxes, and panels without the required qualified seals installed inasmuch as there will be no reactor core fission products which could endanger the health and safety of the public if a design basis accident occurred.

Greater emphasis is now being placed on the training of all TVA designers and checkers to verify that design interface requirements on TVA-approved test reports or vendor documents for qualified equipment have been incorporated into TVA design documents as required by OE Engineering Procedure (EP) 3.10, "Design Verification Methods and Performance of Design Verifications."

Interim Progress - Unit 2

A similar review and investigation has been initiated to identify those unit 2 components requiring conduit sealing and ECN 5308 has been issued to correct these components identified to date. We expect to submit a final report to the NRC for WBN unit 2 by January 31, 1986.