TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

November 27, 1981

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WBRD-50-390/81-20
WBRD-50-391/81-19

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 - ELECTRICAL SEPARATION FIELD AUDIT - WBRD-50-390/81-20, WBRD-50-391/81-19 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. W. Wright on February 5, 1981 in accordance with 10 CFR 50.55(e) as NCR W-31-P. Interim reports were submitted on March 9, April 21, and July 17, 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. Victor Stello, 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
ELECTRICAL SEPARATION FIELD AUDIT
WBRD-50-390-81-20, WBRD-50-391/81-19
FINAL REPORT

Description of Deficiency

An audit was conducted in response to an NRC letter from A. Schwencer, NRC-NRR, to H. G. Parris dated May 2, 1980, which requested TVA to perform an audit of installed electrical equipment and systems to determine conformance with electrical separation criteria. The audit was performed using the criteria stated in chapters 7 and 8 of the Watts Bar Nuclear Plant (WBN) Final Safety Analysis Report (FSAR) and criteria stated in Regulatory Guide (RG) 1.75 with those exceptions listed in the response to NRC Question 40.25. While TVA noted in the response that RG 1.75 is not applicable to WBN, it was stated that the design basically meets RG 1.75 with the stated exceptions. As a result of this statement, TVA considers these requirements applicable to WBN and within the scope of the audit. In addition, documents used as references for interpretation and clarification of the above criteria were other chapters of the FSAR that pertain to the specific systems inspected, various IEEE and ANSI Standards that are referenced in the FSAR, the WBN Design Criteria WB-DC-30-04, "Design Criteria for Separation of Electrical Equipment and Wiring," and the responses in the FSAR to questions from the NRC which pertain to the separation and identification criteria.

The audit was divided into six inspection areas. Each area was inspected to verify that installed equipment adhered to the stated criteria. The audit did not cover all equipment at Watts Bar, but rather sampled approximately 10 percent of the installed equipment to identify any generic deficiencies. The six areas are:

1. Equipment Identification and Separation
2. Conduit and Cable Tray Identification
3. Cable Identification and Route Verification
4. Equipment Internal Wiring and Identification
5. Conduit and Cable Tray Separation
6. System Audit for Identification and Separation

As stated in Interim Report No. 2 (letter from L. M. Mills to J. P. O'Reilly dated March 21, 1981) TVA has identified 11 items (listed in the subject NCR) which were reportable as defined by the requirements of 10CFR50.55(e). These 11 items involve noncompliance with the RG 1.75 requirement of 1-inch physical separation of enclosed electrical cable raceways for redundant class 1E safety-related circuits.

Safety Implications

The class 1E cable raceway separation noncompliance could have resulted in adverse redundant circuit interaction and could have jeopardized the safe operation of the plant had it remained uncorrected.

Corrective Action

An Engineering Change Notice (ECN 3121) is being issued to revise the appropriate conduit and grounding drawings to add a note specifying that, where possible, a minimum of 1 inch shall be maintained between exposed redundant Class IE cable raceways. If the separation is not attainable, a barrier consisting of a 1/2-inch minimum thickness of Maranite-36 (or its equivalent) will be used between the raceways. In addition, cable trays must be installed with solid tray covers or bottoms on the surfaces adjacent to the conduits. The above note will be added to the affected drawings by January 15, 1982.

In instances where it is not possible to conform to the above separation requirements, a documented case-by-case analysis will be made to ensure that redundant Class IE circuits are not degraded below an acceptable level.

The only additional field inspection required will be to verify that the interdivisional safety-related wireways conform to the applicable separation requirements. This additional inspection will be performed by construction personnel in all plant areas containing safety-related cabling.

All necessary field work required to resolve the discrepancies (insuring required physical separation for enclosed electrical raceways) listed in NCR W-31-P will be completed 30 days before unit 1 fuel loading.

To prevent recurrence of this condition, Watts Bar Nuclear Plant (WBN) Quality Control Procedure (QCP) 3.6 - Test 99, has been revised to strengthen the existing inspection procedures for cable separation and internal wiring. Additional WBN QCPs (3.3, 3.4, and 3.5) will be revised and reissued by January 15, 1982, to strengthen their inspection procedures. WBN-QCP 3.16 has been issued to provide inspection procedures for assurance of conformance to separation criteria related to the 6.9 kV shutdown boards.