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February 24, 1981

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Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Schwencer:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

References: 1. Letter from A. Schwencer to H. G. Parris dated May 2, 1980
2. Letter from L. M. Mills to A. Schwencer dated December 4, 1980

In Reference 1, TVA was requested to conduct an electrical separation field audit at Watts Bar Nuclear Plant. An interim status report was provided by Reference 2.

The enclosed report summarizes the findings of the completed audit. Those items which have been identified to be inadequate will be addressed in nonconformance report W-31-P. Resolution of these items will be conducted through NRC's Office of Inspection and Enforcement, Region II.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills

L. M. Mills, Manager
Nuclear Regulation and Safety

Sworn to and subscribed before me
this 24th day of Feb. 1981

Bryant M. Lowery
Notary Public
My Commission Expires 4/4/82

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Enclosure

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
SEPARATION OF ELECTRICAL EQUIPMENT AND SYSTEMS

The inspection for the separation of electrical equipment and systems was performed, using the criteria stated in chapters 7 and 8 of Watts Bar Nuclear Plant's Final Safety Analysis Report (FSAR) and Regulatory Guide 1.75 as quidelines. Other chapters of the FSAR that pertained to specific systems, various standards, NRC questions, and Watts Bar Design Criteria No. WB-DC-30-4 were used as references.

The inspection was divided into the following six areas.

1. Equipment Identification and Separation

   The equipment was inspected for physical distance and/or barriers between safety-related equipment. The installation of permanent equipment was also checked.

   There were three inspection packages written for this area. The 3 inspection packages included the inspection of 92 boards and/or transformers, 68 pumps and motors, and barriers between some electrical equipment rooms. The inspection revealed 23 boards and/or transformers and 48 motors and pumps that were either improperly identified or not identified at all. The physical separation criteria for some motors, board rooms, and transformers for trains A and B was questionable during this audit, but these separations are basically for fire protection and were addressed in the fire protection plan submitted in October 1980.

2. Conduit and Cable Tray Identification

   There were 5 packages written for this area which involved the inspection of 143 cable tray nodes, 203 conduits, and 34 cable tray risers. The criteria describes the color-coding scheme to be used in identifying each division or channel of separation and the method by which raceways are identified. Exposed class 1E raceways should be marked in a distinct, permanent manner at intervals not to exceed 15 feet and at points of entry to and exit from enclosed areas.

   The inspection revealed 54 instances in which the trays were not marked at the 15-foot interval, 22 instances in which cable trays entered a penetration and were not identified, and 53 instances of incorrectly identified conduits. All cable tray risers inspected were marked satisfactorily.

3. Cable Identification and Route Verification

There were 27 inspection packages written for this area, which included 106 divisional cables and 24 nondivisional cables. This inspection was conducted to verify that the generating station protection system cables were installed according to the criteria. The audit revealed 12 cables improperly identified, 23 instances in which raceways were improperly identified, and 9 pull-slip errors. There was also one instance each of cable not installed according to pull slip, nondivisional cable in divisional conduit, cable installed in conduit not listed on pull slip; and there were six instances in which trains A and B violated the separation criteria.

4. Equipment Internal Wiring and Identification

There were 57 packages written covering the main control room, backup control room, and auxiliary instrument room boards to verify conformance to the separation criteria.

All boards containing safety-related components and wiring were inspected in the main control room. There were 5,277 cables, 3,230 instruments, and 8 conduits inspected. There were 41 cables, 65 instruments, and 7 conduits either identified incorrectly or not identified at all. In two of the main control room boards, 1-M-3 and 2-M-3, there are cables identified as special divisional cables being routed with nondivisional cables.

All boards in the backup control room, consisting of 1,548 cables and 751 instruments, were inspected. There were 7 cables and 35 instruments not properly identified. Internal train wiring in two panels was not identified by color-coded tyraps. Two boards, 1-L-10 and 2-L-10, did not meet the minimum air space requirement between divisional and nondivisional wiring.

In the auxiliary instrument room, there were 21 panels inspected, which included 2,123 cables. There were eight cables improperly identified, according to the FSAR. In four panels, the interlock circuit between trains A and B safeguards test cabinets on relay K821 does not maintain the minimum air space, nor is there a metal barrier installed. Furthermore, the design of these circuits does not conform to the FSAR criteria for a train A circuit with an interlock from train B device.

5. Conduit and Cable Tray Separation

There were 16 inspection packages written for inspecting specific areas in the auxiliary, control, reactor, and diesel-generator buildings and the intake pumping station. This inspection area also covered electrical penetrations in the unit 1 reactor containment vessel and the missile zone area around the turbine-driven auxiliary feedwater pump.

The audit revealed that where cables of different divisions cross in the control building cable spreading room and in the auxiliary building on elevations 713 and 737, the vertical separation was not maintained. The minimum distance of one inch between redundant enclosed raceways and the minimum horizontal separation of three feet between trays carrying cables of different divisions of separation was not maintained in the control building cable spreader room and in the auxiliary building on elevation 757. Within a division, the minimum horizontal spacing of six inches between trays was not maintained in the reactor building.

6. System Audit for Identification and Separation

There were nine inspection packages written to cover nine systems. The 9 inspection packages covered 987 conduits or cable tray risers, 13 penetrations, 159 pieces of equipment, and 201 junction boxes. There were 241 conduits and/or cable tray risers improperly identified, and the cable tray risers did not maintain separation in 32 instances. The 13 penetrations did not have any permanent tags, there were 129 pieces of equipment improperly identified or not identified at all, and 18 of the junction boxes were not identified with train/channel designation.