

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

May 4, 1984

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WBRD-50-390/84-18
WBRD-50-391/84-18

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - CABLE INSULATION FAILS FIRE PROTECTION TEST - WBRD-50-390/84-18, WBRD-50-391/84-18 - FINAL REPORT FOR UNIT 1 AND FIRST INTERIM REPORT FOR UNIT 2

The subject deficiency was initially reported to NRC-OIE Inspector Bob Carroll on April 5, 1984 in accordance with 10 CFR 50.55(e) as NCR WBN EEB 8408. Enclosed is our final report for unit 1 and first interim report for unit 2. We expect to submit our next report for unit 2 on or about January 21, 1985.

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

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, 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
CABLE INSULATION FAILS FIRE PROTECTION TEST
NCR WBN EEB 8408
WBRD-50-390/84-18 AND WBRD-50-391/84-18
10 CFR 50.55(e)

FINAL REPORT FOR UNIT 1 AND FIRST INTERIM REPORT FOR UNIT 2

Description of Deficiency

In order to meet the requirements of 10 CFR 50, Appendix R, TVA has installed a one-hour fire barrier manufactured by 3M Company (TVA contract 83KB5-832419) for cable trays, conduits, and junction boxes. The 3M fire barrier material has received Underwriters Laboratories (UL) certification. However, included with that certification is stipulation that the user (TVA) must ensure that the cable being protected by the fire barrier will perform its function while being exposed to the elevated temperatures measured inside the fire barrier during the qualification test.

Toward this end, TVA performed oven testing of electrical cables at TVA's Central Laboratories (Chattanooga Power Service Center). This testing has shown that polyethylene-insulated cable (TVA types PN, PJ, PNJ, and PJJ manufactured by various vendors) will not perform its required design function when subjected to the temperature specified by UL to validate the fire barrier qualification. The insulation on the cables will melt causing the cables to fail by shorting.

The root cause of this deficiency is that TVA did not realize that the use of the one-hour fire barriers would result in unacceptably high temperatures for some cables because the temperatures the cables would be exposed to while in the fire barriers were identified by the barrier vendor (3M Company) after the barriers were installed.

Safety Implications

Some of the cables involved in this deficiency are used in safe shutdown circuits and, therefore, are essential to safety-related systems. Failure of these cables could cause degradation of essential safety-related systems, and thus have adverse affects on the safe operation of the plant.

Corrective Action - Unit 1

This corrective action applies only to cables which have been identified as being required for safe shutdown circuits.

PN, PJ, PNJ, and PJJ type cables that pass through a UL certified one-hour fire barrier will be disconnected from the circuits at the nearest possible point to the fire barrier. The disconnected cables that pass through a cable tray fire protection system will be either abandoned in the tray or pulled out. The disconnected cables that pass through a conduit fire protection system will be pulled out of the conduits. In both cases (cable tray and conduit), the cables will be replaced with a qualified cable or the cables will be rerouted such that use of the fire barriers is not required. There are no cables of this type located in junction boxes.