

TENNESSEE VALLEY AUTHORITY

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JUN 6 1986 43

WBRD-50-391/84-18

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 - CABLE INSULATION FAILS FIRE PROTECTION TEST -
WBRD-50-391/84-18, - FOURTH INTERIM REPORT

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. Previous interim reports for unit 2 were submitted on May 4, 1984, January 24, and September 18, 1985. Due to unit 1 priorities, little progress has been made since our third interim report was submitted. Enclosed is our fourth interim report for unit 2. We expect to submit our next report on or about January 16, 1987.

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, Director
Nuclear Safety and Licensing

Enclosure

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

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 2
CABLE INSULATION FAILS FIRE PROTECTION TEST
WBRD-50-391/84-18
NCR WBN EEB 8408
10 CFR 50.55(e)
FOURTH INTERIM REPORT

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 83K85-832419) for cable trays, conduits, and junction boxes. The barrier is of the wrap-on type. The 3M fire barrier material has received Underwriters Laboratories (UL) certification. However, included with the certification is a stipulation that the user (TVA) must ensure that the cables being protected by the fire barrier will perform their functions while being exposed to the elevated temperatures measured inside the fire barriers during the qualification tests.

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 cables (TVA types PN, PJ, PNJ, and PJJ manufactured by various vendors) will not perform their required design functions when subjected to the temperatures required by UL to validate the fire barrier qualification. The insulation on the cables will melt causing the cables to fail by shorting.

The 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 temperature requirements for cable exposure while in the fire barriers were not identified by the barrier vendor (3M Company) until 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 effects on the safe operation of the plant.

Interim Progress

The Appendix R evaluation for Watts Bar Nuclear Plant unit 2 was placed on hold in the fall of 1985 due to an emphasis on completing the unit 1 work. TVA has resumed its work on Appendix R for unit 2. This requires continued review of newly placed 3M fire barriers to determine the presence of polyethylene-insulated cables. Also, TVA anticipates the installation of additional fire barriers. As such, rerouting or replacement of polyethylene cable is necessary.

To prevent a recurrence of this problem, TVA has modified its computerized cable schedule to change the approved cable types from polyethylene-insulated cables to qualified replacement type cables. Also, a special Division of Nuclear Engineering (DNE) approval is now required to pull a polyethylene cable for a safe shutdown circuit and a denial is given for any request to pull such a cable through a UL-certified one-hour fire barrier.

TVA will provide our next report on this matter on or about January 16, 1987.