

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

February 6, 1985

WBRD-50-390/84-37
WBRD-50-390/84-40
WBRD-50-391/84-35

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. Grace:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - INADEQUATE SEPARATION OF SHUTDOWN SYSTEM
CABLES - WBRD-50-390/84-37, WBRD-50-390/84-40, AND WBRD-50-391/84-35 - FINAL
REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
Dave Verrelli on July 23, 1984 in accordance with 10 CFR 50.55(e) as NCRs
WBN MEB 8422 and 5761. A final report was submitted on August 27, 1984. TVA
then re-opened this NCR with an interim report dated October 25, 1984. 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

J. W. Hufham

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
INADEQUATE SEPARATION OF REDUNDANT CABLES NEAR FLOOR OPENINGS
NCRs WBN EEB 8422 AND 5761
WBRD-50-390/84-37, WBRD-50-391/84-40
AND WBRD-50-391/84-85
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Horizontal separation greater than 20 feet between redundant train equipment without intervening combustibles or fire hazards, and with area fire detection, and an automatic fire suppression system comprise one of the acceptable configurations allowed under 10 CFR 50, Appendix R, for ensuring that one redundant train of safe shutdown equipment within a fire area is free of fire damage. During a 10 CFR 50, Appendix R, design review conducted for Watts Bar Nuclear Plant (WBN) during July 1984, several instances of inadequate separation between various redundant circuit cables required to achieve safe shutdown during the event of a fire were identified. This was documented on nonconformance report (NCR) 5761. Additionally, several problems were identified in which power and control cables for the diesel generator shutdown system for unit 1 do not have the required 20 feet of separation from redundant system cables or components. This was documented on NCR WBN EEB 8422.

TVA has determined that the root cause of these deficiencies was a design oversight. This oversight was the lack of an established procedure for performing a fire protection analysis or for reviewing a previously implemented design to ensure compliance with 10 CFR 50, Appendix R.

Safety Implications

A single exposure fire which involves redundant cables or intervening combustibles could produce effects (e.g., smoke, heat, or ignition) which could adversely affect other redundant cables of a safe shutdown system. Both affected redundant cables could be adversely affected in the event of a fire from intervening combustibles. Thus, a single postulated fire could prevent the accomplishment of operations necessary for safe plant shutdown. This could adversely affect the safe operation of the plant.

Corrective Action

TVA's Office of Engineering (OE) has revised the safe shutdown analysis (OE calculation. "Equipment Required for Safe Shutdown per 10 CFR 50 Appendix R"). This revision eliminated some of the equipment which was previously considered necessary for safe shutdown of the plant and thereby eliminated several instances of inadequate separation (per Appendix R) of cables listed on the NCR. A reevaluation of the remaining items on the NCR has identified that corrective actions are necessary in order to meet the separation requirements of 10 CFR 50, Appendix R, and calculation, "Equipment Required for Safe Shutdown per 10 CFR 50 Appendix R."

To accomplish the required corrective actions, TVA has issued engineering change notices (ECN), 5046, 5047, 5229, and 5338. Changes required by these ECNs involve the protection of certain identified conduits and cable trays by the installation of a 1-hour fire rated barrier. Additionally, some cables will be rerouted in order to achieve the required separation. All redesign associated with these ECNs has been completed.

To prevent recurrence of these deficiencies, TVA has issued a special engineering procedure (SEP), OE-SEP 84-09, entitled "Safe Shutdown Analysis for Postulated Fire at Watts Bar Nuclear Plant." This procedure provides the framework and establishes requirements to ensure that an adequate analysis and review is performed for WBN to achieve and maintain a plant configuration that is in compliance with 10 CFR 50, Appendix R. This SEP will remain in effect until establishment of design criteria that will provide permanent plant design guidance for adhering to the requirements of 10 CFR 50, Appendix R.

All corrective action except the wrapping of affected conduits and cable tray with 1-hour rated fire barrier for NCRs WBN EEB 8422 and 5761 will be completed by February 21, 1985. The wrapping of conduits and cable trays will be completed by April 19, 1985. Extension of this work beyond fuel loading for WBN unit 1 is acceptable because the capability to bring the plant to a safe shutdown condition is not necessary until after initial criticality has been achieved.