

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

WB RD-50-390/84-39
WB RD-50-391/84-34

February 1, 1985

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

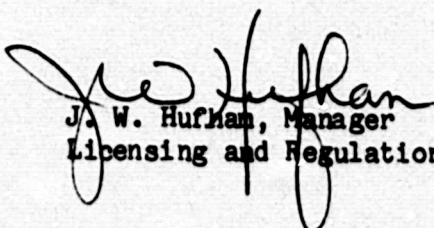
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - SPURIOUS VALVE OPERATION DUE TO FIRE
DAMAGE - WB RD-50-390/84-39, WB RD-50-391/84-34 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Dave Verrelli on July 30, 1984 in accordance with 10 CFR 50.55(e) as NCR 5760. Our first interim and final reports were submitted on August 24 and September 27, 1984. TVA then reopened this NCR with a third interim report dated October 4, 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. Huffman, Manager
Licensing and Regulations

Enclosure

cc (Enclosure):

Mr. Richard C. DeYoung, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

8503130585 850201
PDR ADOCK 05000390
S PDR

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
SPURIOUS VALVE OPERATION DUE TO FIRE DAMAGE
NCR 5760
WBRD-50-390/84-39 AND WBRD-50-391/84-34
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

During July 1984, TVA performed a 10 CFR 50 Appendix R design review for Watts Bar Nuclear Plant (WBN). During this review, several sets of redundant valves were observed to be capable of invalidating the safe shutdown analysis for WBN. This is due to potentially spurious valve operation as a result of fire damage to control circuitry. The following sets of valves were identified:

1-FCV-67-126, -128 (Essential Raw Cooling Water (ERCW) System)
1-FCV-70-197, -010 (Component Cooling Water (CCW) System)
1-FCV-70-002, -003 (CCW system)

Additional valves and/or systems could be affected.

TVA has determined the cause of this deficiency to be a design oversight. This resulted from not having an established procedure for performing a fire protection analysis or for reviewing previously implemented design to ensure compliance with 10 CFR 50, Appendix R.

Safety Implications

Spurious actuation of an affected valve(s) during a fire could prevent the safe shutdown of the plant. This could result by spuriously closing essential safety-related flow paths, or by spuriously diverting flow from an essential path to another nonessential system or component. This could adversely affect the safe operation of the plant.

Corrective Action

TVA has completed a review of the 10 CFR 50, Appendix R, shutdown paths that could be affected by the spurious actuation of the valves listed above. As a result of the cable routing review, valves 1-FCV-67-127, -128 and 1-FCV-70-002, -003, -010 will be placed in the safe position and then have the power to the valves pulled so the valves cannot spuriously operate during a fire. The changes to the power circuits for these valves will be accomplished under engineering change notice (ECN) 5317. Valve 1-FCV-70-197 is the component cooling water isolation valve to the spent fuel pit heat exchanger A. During unit 1 operation, the heat exchanger will not be used, and the discharged piping is blanked off so spurious actuation of valve 1-FCV-70-197 would not affect the CCW system. After two-unit operation is initiated, the valve may spuriously

operate during a fire but with no detrimental effects on plant safety. The spent fuel pit heat exchangers need to be isolated only when the residual heat removal (RHR) system is used to bring the plant to cold shutdown. The operator has time to manually close this valve or a manual isolation valve to isolate flow to the spent fuel pit heat exchanger prior to needing RHR.

To prevent recurrence of this deficiency, TVA has issued an Office of Engineering (OE) special engineering procedure (SEP) OE-SEP 84-09, entitled "Safe Shutdown Analysis for Postulated Fire at Watts Bar Nuclear Plant." This procedure will provide the framework and establish 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.

TVA has completed a review of all 10 CFR 50, Appendix R, shutdown paths in accordance with OE-SEP 84-09. All valves capable of invalidating the Appendix R safe shutdown analysis due to spurious operation as a result of fire damage to control circuitry have been identified. The corrective action for all valves identified by this review other than the six (6) valves identified by this NCR will be handled by the Appendix R review plan defined in OE-SEP 84-09.