

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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JAN 24 1989

WBRD-50-390/87-15

10 CFR 50.55(e)

WBRD-50-391/87-16

U.S. Nuclear Regulatory Commission

ATTN: Document Control Desk

Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of)

Docket Nos. 50-390

Tennessee Valley Authority)

50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - AUXILIARY CONTROL CABLES ROUTED THROUGH THE CONTROL BUILDING - WBRD-50-390/87-15 AND WBRD-50-391/87-16 - FINAL REPORT

The subject deficiency was initially reported to NRC Region II Inspector Gordon Hunegs on July 1, 1987, in accordance with 10 CFR 50.55(e) as Significant Condition Report (SCR) WBN EEB 8701. In the future this deficiency will be tracked under Condition Adverse to Quality Report (CAQR) WBP 880567 for unit 2. Our interim report was submitted on July 23, 1987. Enclosure 1 provides our final report. Enclosure 2 lists all commitments made in this report.

If there are any questions, please telephone G. R. Ashley at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley, Manager
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Enclosures

cc: See page 2

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U.S. Nuclear Regulatory Commission

JAN 24 1989

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
AUXILIARY CONTROL SYSTEM CABLES ROUTED THROUGH THE CONTROL BUILDING
SIGNIFICANT CONDITION REPORT (SCR) WBN EEB 8701 AND
CONDITION ADVERSE TO QUALITY REPORT (CAQR) WBP 880567
10 CFR 50.55(e)

FINAL REPORT

DESCRIPTION OF DEFICIENCY

A deficiency has been identified at Watts Bar Nuclear Plant (WBN) involving the Auxiliary (backup) Control System (ACS) electrical cables. The ACS must be operable from one or more locations external to the Control Building in the event that the Control Building must be evacuated. This requires that the auxiliary control locations be separated and wired such that the loss of use of the main control room will not prevent bringing the reactor to a safe shutdown condition.

Contrary to the above requirement, for unit 1 more than 100 ACS cables have been identified that are routed through the same fire zone with the main control room cables. The fire zone referred to is the cable spreading room of the WBN Control Building. Therefore, a fire within the cable spreading room could potentially cause failure of the control room cables and concurrent failure of the ACS cables. An evaluation of the function and failure affects of the more than 100 ACS cables revealed that 13 of the cables are required to establish and/or maintain safe shutdown of unit 1.

The interim report states that approximately 30 (unit 1 and unit 2) ACS cables were routed through the Control Building cable spreading room. Once the list of ACS devices was developed, a final review identified over 100 ACS cables that are routed through the Control Building for unit 1 alone.

As indicated in TVA's interim report, a similar condition exists for unit 2. This condition is now tracked by CAQR WBP880567 for unit 2.

The root cause of this deficiency is that the ACS cable separation requirements were not clearly defined. Also, ACS components and/or circuits required for safe shutdown of the plant were not identified. Therefore, the cable designer had inadequate guidance to prevent improper routing of ACS cables.

SAFETY IMPLICATIONS

Failure of the ACS cables concurrent with failure of the main control cables could lead to the inability to establish and/or maintain the plant in a safe shutdown condition due to the loss of control at both main and auxiliary control stations. Functions which would be lost due to failure of the ACS cables include main steam power operated relief valves, auxiliary feedwater control valves, and component cooling indication. This could adversely affect safe operation of the plant during an event which renders the main control room inoperable or inaccessible.

CORRECTIVE ACTIONS

For unit 1, TVA has developed and issued Design Criteria WB-DC-40-58 which defines the functions required for safe shutdown using the ACS, and developed calculation WBPEVAR8808035 which lists devices providing the functions identified in the design criteria. Design Criteria WB-DC-30-4, Separation/Isolation, has been revised to clearly state that circuits required for the ACS shall not be routed through the Control Building. Watts Bar Engineering Procedure (WBEP) 5.31, "Cable Record Development and Issue," has been revised to reflect this requirement. TVA reviewed all cables for the devices listed in the aforementioned calculation for correct separation in accordance with the above revised Design Criteria. In accordance with the calculation results, 13 cables will be rerouted away from the Control Building. This will be accomplished by Design Change Notice (DCN) P-01219-A. Rerouting of the unit 1 cables will be completed before fuel load of unit 1.

A similar study and reroute of unit 2 ACS cables will be accomplished under CAQR WBF 880567 by fuel load of unit 2.

The revision of Design Criteria WB-DC-30-4 and WBEP 5.31, in conjunction with the issue of calculation WBPEVAR8808035 listing ACS components and associated cables, provides the designer with sufficient detail to correctly apply separation of ACS cables in the future. These actions will prevent recurrence of these deficiencies.

ENCLOSURE 2

LIST OF COMMITMENTS

1. In accordance with the calculation results, 13 cables will be rerouted away from the Control Building. This will be accomplished by Design Change Notice (DCN) P-01219-A. Rerouting of the unit 1 cables will be completed before fuel load of unit 1.
2. A similar study and reroute of unit 2 ACS cables will be accomplished under CAQR WBP 880567 by fuel load of unit 2.