

TENNESSEE VALLEY AUTHORITY

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MAR 21 1988

WBRD-50-390/87-10
WBRD-50-391/87-10

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of)
Tennessee Valley Authority)

Docket Nos. 50-390
50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - FAILURE OF CATEGORY C DEVICES MAY
ADVERSELY AFFECT CATEGORY A DEVICES - WBRD-50-390/87-10 AND WBRD-50-391/87-10 -
FINAL REPORT

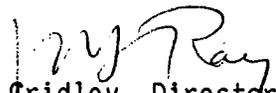
The subject deficiency was initially reported to NRC Region II Inspector
Gordon Hunegs on April 2, 1987, in accordance with 10 CFR 50.55(e) as SCRs
WBN EEB 8680 and EEB 8684. Our interim report was submitted on April 30, 1987.
Enclosed is our final report.

The NRC Region II office was notified on February 20, 1988, of a delay in
submitting this report. Glenn Walton and Gordon Hunegs were notified of
additional delays on February 29 and March 11, 1988, respectively.

If there are any questions, please telephone C. J. Riedl at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


R. Gridley, Director
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Regulatory Affairs

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

MAR 21 1988

cc (Enclosure):

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ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2
FAILURE OF CATEGORY C DEVICES
MAY ADVERSELY AFFECT CATEGORY A DEVICES
SCRs WBN EEB 8680 AND WBN EEB 8684
10 CFR 50.55(e)

FINAL REPORT

DESCRIPTION OF DEFICIENCY

The subject Significant Condition Reports (SCRs) identify a condition in which failure of environmental qualification (EQ) category C electrical devices may result in EQ category A devices being unable to perform their safety functions. Category C devices are defined as equipment which will experience design basis accident (DBA) environments but are not required to function for mitigation of the DBA which created the adverse environment. Category A devices are defined as equipment which will experience DBA environments and must function for mitigation of the DBA which created the adverse environment. This condition is in violation of 10 CFR 50.49, which states that nonsafety-related equipment failure because of postulated environmental conditions should not prevent satisfactory performance of safety-related equipment.

Some specific examples of devices which would have adverse interaction because of DBA harsh environment are as follows:

- ° A ground fault in a category C handswitch resulting in the inability of several isolation valves (category A devices) to function for postaccident monitoring (reactor coolant, containment sump, and containment atmosphere sampling).
- ° A short circuit in a category C valve limit switch resulting in failure of a letdown containment isolation valve (category A device) to close.
- ° A short circuit in a category C valve limit switch resulting in the inability to open emergency gas treatment suction valve (category A device).

The root cause of this deficiency is attributed to the fact that at the time these components were designed, the environmental qualification program was less stringent than the requirements contained in 10 CFR 50.49 and TVA's current environmental qualification program.

SAFETY IMPLICATIONS

Failure of category C devices because of a harsh environment could result in failure of essential safety-related components which are required to perform for accident mitigation.

Loss of any of these functions could adversely affect the safe shutdown of the plant after a DBA which resulted in harsh environments.

CORRECTIVE ACTION

All affected devices in units 1 and 2 have been identified by the Division of Nuclear Engineering (DNE) calculation WBPE VAR 8600 3005. This calculation provides a failure analysis of category C electrical devices, their effect on category A electrical devices, and the consequences to safety-related component operation. Approximately 66 unit 1 and 48 unit 2 devices were identified by the calculations as requiring corrective action. These devices affect the Air Conditioning, Feedwater Control, Chemical and Volume Control, Emergency Gas Treatment, and Radiation Monitoring Systems. Corrective action will be to upgrade deficient category C devices or install isolation devices to mitigate the effect of failure of a category C device on category A devices.

The requirements for qualifying all class 1E equipment within the scope of 10 CFR 50.49 are now defined within design instruction NEB DI-125-01 and Engineering Procedure WBEP-EP 43.06. This, in conjunction with the WBN environmental qualification program, will prevent recurrence of this deficiency.

All corrective actions will be completed before fuel load of the respective unit.