Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

NOV 07 1994

CDR-50-390/87-10
CDR-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 - MATERIALS PROGRAM DEFICIENCY - FAILURE OF CATEGORY C DEVICES MAY ADVERSELY AFFECT CATEGORY A DEVICES - CONSTRUCTION DEFICIENCY REPORT CDR-50-390/87-10 AND CDR-50-391/87-10 - SUPPLEMENT TO FINAL REPORT

The purpose of this letter is to supplement TVA's final report for CDR-50-390/87-10 and CDR-50-391/87-10 with a similar condition documented in Finding Identification Report (FIR) WBA890571001. CDR-50-390/87-10 and CDR-50-391/87-10 were initially reported to NRC Region II Inspector Gordon Hunegs on April 2, 1987, as SCRWBNEEB8680 and SCRWBNEEB8684. An interim report was submitted on April 30, 1987, and a final report on March 21, 1988. A supplement to the final report is provided in the enclosure.

If there are any questions, please telephone P. L. Pace at (615) 365-1824.

Sincerely,

Dwight E. Nunn
Vice President
New Plant Completion
Watts Bar Nuclear Plant

Enclosure
cc: See page 2

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cc (Enclosure):
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
CDR-50-390/87-10, CDR-50-391/87-10
SUPPLEMENT TO FINAL REPORT

DESCRIPTION OF DEFICIENCY AS PROVIDED IN TVA'S FINAL REPORT

"The subject Significant Condition Reports (SCRWBNEEB8680 and SCRWBNEEB8684) 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. 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 post accident 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."

FINDING IDENTIFICATION REPORT (FIR) WBA890571001

Watts Bar Design Criteria WB-DC-40-54, Environmental Qualification to 10 CFR 50.49, now specifies that the following must be considered to determine if a device is Category C:

(a) Affects on a Category A or B device, including interconnection of power supplies and control logic;

(b) Affects on devices in mild environments which must function to mitigate a design basis accident;

(c) Affects on Class 1E power systems.

Categories A, B, and C are defined in NUREG 0588. A device is categorized with an A, B, or C based on the environmental conditions of the design basis accidents for which they must (A) function, (B) need not function but must not fail, or (C) whose failure is deemed not detrimental to plant safety or accident mitigation.

Contrary to the above, FIR WBA890571001 identified examples of Category C devices that have been added or relocated by design changes/calculations since December 1986, without addressing the potential interactions as noted above.

This deficiency occurred because of deficient procedures and the lack of training for existing procedures.

SAFETY IMPLICATIONS

The condition potentially would adversely affect the capability of essential safety-related equipment to mitigate the consequences of a design basis accident (DBA).

CORRECTIVE ACTIONS

In addition to the corrective actions provided in TVA's final report dated March 21, 1988, for SCRs WBNEEB8680 and WBNEEB8684, TVA has taken the following steps to resolve FIR WBA890571001:

System Category and Operating Time (C&OT) calculations, Design Change Notices (DCNs) and Engineering Change Notice (ECNs) Modification Packages that have been issued since December 1986 have been evaluated for potential impacts to calculation WBPEVAR8603005, Failure Analysis of Category C Devices Utilized in Class 1E Power Systems.

These evaluations identified the need for detailed failure modes and effects analysis (FMEA) for a number of DCNs. FMEA have been performed and documented for these DCNs in new and/or revised interaction calculations.

Unacceptable component interactions have been corrected by Design Change Notice M-20561-A. This design change added isolation fuses to the 480 volt shutdown boards for eight ventilating system flow switches. These modifications have been completed.

Engineering Administrative Instruction (EAI)-7.05, "Watts Bar 10 CFR 50.49 Program Requirements For Environmental Qualification of Electrical Equipment," has been revised to require impact reviews for C to A interaction calculations. Changes that add or delete devices, or changes the category of a device require an impact review.

EAI-3.19, "Change Review Checklist For Electrical Calculations," has been revised to include questions which will help identify any impact to WBPEVAR8603005 when modifications are made to circuits containing Category C devices.

Affected personnel have been retrained to the requirements of the above procedures.