TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
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JUN 12 1987

WBRD-50-390/87-04
WBRD-50-391/87-04

10 CFR 50.55(e)

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

Gentlemen:

WATTS BAR NUCLEAR PLANT (WBN) - UNITS 1 AND 2 - POTENTIAL LOSS OF ECCS INVENTORY THROUGH AIR RETURN FAN - WBRD-50-390/87-04, WBRD-50-391/87-04 - FINAL REPORT

The subject deficiency was initially reported to NRC-Region II Inspector Gordon Hunegs, on January 12, 1987, in accordance with 10 CFR 50.55(e) as SCRs WBN NEB 8654 and WBN NEB 8655. TVA transmitted an interim report on this deficiency on February 11, 1987. Enclosed is our final report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

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Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

JUN 12 1987

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ENCLOSURE
WATTS BAR NUCLEAR PLANTS UNITS 1 AND 2
POTENTIAL LOSS OF ECCS INVENTORY THROUGH AIR RETURN FAN
WBRD 50-390/87-04 AND 391/87-04
SCRs WBN NEB 8654 AND WBN NEB 8655
10 CFR 50.55(e)
FINAL REPORT

DESCRIPTION OF DEFICIENCY

Water from the containment spray ring headers is required to drain to the emergency containment sump for recirculation to the Containment Spray System (CSS) and Emergency Core Cooling System (ECCS). A design modification was made to seal the crane wall so that 13.2 feet of water would be retained inside the crane wall. During this modification it was not recognized that spray water collecting on the operating deck could flow into the recessed air return fan opening (each unit contains two air return fans, however, only one in each unit is recessed), the equipment trenches, and the personnel access door trenches to the lower containment area (dead ends) outside the crane wall. Since the crane wall is sealed to an elevation of 13.2 feet above floor level, water outside the crane wall would not flow to the sump located inside the crane wall. This condition would gradually deplete the inventory (over 50 percent in less than two days) of water available for CSS and ECCS in the recirculation mode. In addition, water runoff from the operating deck into the air return fan may cause failure of the fan.

The root cause of this condition was inadequate interface review of the design change which sealed the crane wall to an elevation of 13.2 feet above the floor level.

This condition was discovered as the result of a generic review of a similar condition at Sequoyah Nuclear Plant.

SAFETY IMPLICATIONS

Until water outside the crane wall reaches a depth of 13.2 feet, the crane wall seals prevent water from returning to the emergency sump. This configuration may result in an insufficient amount of water being available inside the crane wall to provide sufficient net positive suction head and/or prevent sump vortexing of emergency core cooling pumps, and thereby to ensure long-term cooling after a LOCA. Failure of the recessed fan due to water runoff from the operating deck, assuming a single failure in the other fan, would limit air circulation from the upper to lower compartments reducing containment cooling and could impact the plant's ability to mitigate the post-LOCA hydrogen production.

CORRECTIVE ACTION

TVA will install curbing around the equipment access hatch and the personnel access door as required to direct the water runoff from the operating deck into the refueling canal (where it can return to the sump). This will eliminate water flow loss through the air return fan, the equipment trenches, and the personnel access door trenches into the dead end compartments with the

exception of entrained atmospheric water lost through the fans, which will not cause failure of the fan. Water entrained in the fan flow will be blown into the accumulator rooms. The existing curbs in the affected accumulator rooms will be modified and the accumulator room floor penetrations will be sealed or curbed to prevent water loss from this room into the dead ended compartments outside the crane wall. In addition, a drainage system will be installed to direct the trapped water from the accumulator room to the sump.

Nuclear Engineering Procedures (NEPs) 5.2 and 6.1 have been implemented since the occurrence of this deficiency. This action will prevent recurrence of this deficiency by enhancing the process by which design changes are identified, scoped, coordinated, interface reviewed, and approved.

The corrective actions for units 1 and 2 will be completed by fuel load of the respective unit.