TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

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

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Attention: Dr. J. Nelson Grace

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - POTENTIAL LOSS OF ECCS INVENTORY THROUGH AIR RETURN FAN - WBRD-50-390/87-04, WBRD-50-391/87-04 - INTERIM 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 NCRs WBN NEB 8654 and WBN NEB 8655. Enclosed is our interim report. We expect to submit our next report on or about June 15, 1987.

If there are any questions, please get in touch with R. D. Schulz at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

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Enclosure
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2

POTENTIAL LOSS OF ECCS INVENTORY THROUGH AIR RETURN FAN

SCRs WBN NEB 8654 AND WBN NEB 8655

10 CFR 50.55(e)

INTERIM 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 a portion of the spray water could pass through the recessed air return fan opening, 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 while in the recirculation mode.

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 to prevent sump vortexing of emergency core cooling pumps, and thereby to ensure long-term cooling after a LOCA. In addition, failure of one of the air return fans could occur as a result of water flow through the fan. The failure of the 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.

INTERIM PROGRESS

Preliminary indications are that plant modifications must be performed to ensure adequate water availability to the ECCS and containment spray system and to prevent failure of the air return fan. TVA is currently evaluating the following options:

1. Unsealing the crane wall down to a height less than 13.2 feet.

2. Installing curbs around the equipment access hatch and the personnel access door. This option will disallow water flow into the air return fan, as well as eliminate all water loss to the dead end compartments, with the exception of the entrained atmospheric water lost through the air return fans.

3. Install curbs in the fan accumulator rooms and seal any floor penetrations in the accumulator rooms' floor if necessary. Drill penetrations in the crane wall (no larger than 3" sleeves) in the accumulator rooms to drain the water lost through the air return fans back to the lower compartment and emergency sumps.

TVA will provide more information on this matter to the NRC on or about June 15, 1987.

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