

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

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WBRD-50-390/84-29

WBRD-50-391/84-26

U.S. Nuclear Regulatory Commission
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - INCREASED ENVIRONMENTAL TEMPERATURES
IN THE MAIN STEAM VALVE ROOMS - WBRD-50-390/84-29, WBRD-50-391/84-26 - FINAL
REPORT FOR UNIT 1 AND SEVENTH INTERIM REPORT FOR UNIT 2

The subject deficiency was initially reported to NRC-OIE Inspector P. E. Fredrickson on May 22, 1984 in accordance with 10 CFR 50.55(e) as NCR WBN NEB 8403. Interim reports were submitted on July 21, August 17, and October 2, 1984 and March 7, June 12, and August 13, 1985. Enclosed is our final report for unit 1 and seventh interim report for unit 2. We expect to submit our next report for unit 2 on or about July 11, 1986. We consider 10 CFR Part 21 applicable to this deficiency.

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


J. W. Huffman
Manager of Licensing

Enclosure

cc: Mr. James Taylor, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center (Enclosure)
Institute of Nuclear Power Operations
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
INCREASED ENVIRONMENTAL TEMPERATURES IN THE MAIN STEAM VALVE ROOMS
WBRD-50-390/84-29, WBRD-50-391/84-26
NCR WBN NEB 8403
10 CFR 50.55(e)
FINAL REPORT FOR UNIT 1 AND
SEVENTH INTERIM REPORT FOR UNIT 2

Description of Deficiency

The current Westinghouse main steam line break (MSLB) mass and energy release analysis did not consider the effects of steam superheating following steam generator tube uncover. Inclusion of the steam superheating will result in a large increase in the environmental temperature following an MSLB in either main steam valve vault. The new temperature (446°F estimate) will exceed the currently predicted temperature of 325°F for Watts Bar Nuclear Plant (WBN) and must be considered in regard to qualification of class 1E electrical equipment, safety-related mechanical equipment, and valve vault structural integrity.

Safety Implications

The new Westinghouse MSLB mass and energy release analysis includes steam superheating following steam generator tube uncover. The superheated steam results in higher valve vault temperatures than those used for previous design calculations. The higher temperature could affect the environmental qualification of class 1E electrical equipment, safety-related mechanical equipment, and valve vault structural steel.

Corrective Action - Unit 1

TVA has completed a safety evaluation of the effects of an MSLB in the valve vaults at WBN. The environmental conditions utilized during the evaluation were calculated from plant-specific MSLB mass and energy data which included the effects of superheating due to steam generator tube uncover during blowdown. The safety evaluation identified equipment in the valve vault that could be potentially affected by the MSLB environment and evaluated the effects of the calculated environmental conditions upon the equipment's ability to perform its required protection function. Analyses were performed to demonstrate that adequate long-term heat removal was available and that the departure from nucleate boiling ratio (DNBR) criteria was not violated. In addition, potential failure modes of the equipment due to the severe environmental temperatures were evaluated to determine impact on plant safety.

The safety evaluation conclusively demonstrated that an MSLB in the valve vault can be safely mitigated for the entire spectrum of break sizes. The structural steel will remain intact even though some localized yielding will

occur and the valve vault concrete may undergo some localized damage with some spalling but that its structural integrity will not be affected. Also, it was shown that none of the equipment affected by the increased temperatures was needed to mitigate an MSLB in the valve vaults. However, it was determined that pressure transmitters used for postaccident monitoring (PAM) and their related cables required additional protection during the brief period of increased environmental temperatures. Thermal protection has been installed for unit 1 per engineering change notices (ECNs) 5019 and 5401. An analysis demonstrating the adequacy of the protective system has been completed. In addition, it was determined that wiring changes were required for the main steam isolation valves' (MSIVs) solenoid valves in order to ensure that spurious actuation (i.e., opening) would not inadvertently occur after the postulated MSLB events. The required MSIV wiring changes will be completed by TVA before initial criticality for unit 1 per ECN 6014.

TVA's timeframe of completing the unit 1 MSIV wiring changes after fuel loading but prior to initial criticality is considered acceptable since there is no danger of a release of fission products present until after initial criticality (i.e., there are no fission products present until after initial criticality).

Interim Progress - Unit 2

TVA is still considering whether to provide thermal protection for the PAM instrumentation or to move the transmitters and cable outside the main steam valve room. A final report on unit 2 will be provided to NRC Region II by July 11, 1986.