TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

SEP 28 1989

WBRD-50-390/84-29
WBRD-50-391/84-26

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) Docket Nos. 50-390
Tennessee Valley Authority) 50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - INCREASED ENVIRONMENTAL TEMPERATURES IN THE MAIN STEAM VALVE ROOMS - WBRD-50-390/84-29 AND WBRD-50-391/84-26 - REVISED FINAL REPORT

The subject deficiency was initially reported to NRC Region II Inspector P. E. Fredrickson on May 22, 1984, in accordance with 10 CFR 50.55(e) as Nonconforming Condition Report (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. Our final report for Unit 1 and seventh interim report for Unit 2 were submitted on January 13, 1986. Our final report for Unit 2 was submitted on July 24, 1986. We consider 10 CFR Part 21 applicable to this deficiency.

Enclosure 1 provides our revised final report. Enclosure 2 provides the list of commitments made in this report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

M J Ray for

Manager, Nuclear Licensing
and Regulatory Affairs

Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

SEP 28 1989

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ENCLOSURE 1

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

REVISED FINAL REPORT

Description of Deficiency

The Westinghouse main steam line break (MSLB) mass and energy release analysis (current in May 1984, when this issue originated) did not consider the effects of steam superheating following uncovering of steam generator tubes. 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 will exceed the predicted temperature of 325°F for 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 uncovering of steam generator tubes. The superheated steam results in higher steam 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

TVA provided documentation in an April 10, 1986 letter showing that all safety-related equipment required to operate following an MSLB in the valve vault would perform its safety-related function before its environmental qualification temperature is exceeded. This approach assumed failure of all class 1E equipment in the valve vaults when qualification temperatures were exceeded and showed that these failures would be acceptable. To show that these failures were acceptable, TVA provided information showing the plant could be maintained cooled down after a steam line break using only one steam generator and that multiple steam generator blowdowns were acceptable. This represents a change in the design basis of the plant and may involve a substantial review effort by the staff. Because of the potential magnitude of the review effort involved in fully resolving the issue with the current approach, TVA has prepared a letter to the Office of Nuclear Reactor Regulation (NRR), withdrawing the April 10, 1986 submittal from further review, and intends to resolve the issue using the staff-approved Sequoyah Nuclear Plant (SQN) methodology.

Using the SQN methodology will not alter the WBN design basis. In addition, the SQN methodology has been reviewed in detail by the staff and by independent contractors retained by the staff. The staff documented approval of the SQN approach in a safety evaluation report (SER) issued in May 1988. The effects of an MSLB with superheat in the valve vault rooms at WBN is expected to be bounded by the SQN analysis. Therefore, the majority of the analyses performed for SQN will be applicable to WBN.

SQN resolved the issue by performing a complete reanalysis of the effects of an MSLB with superheat, following a postulated break in the valve vault rooms. The reanalysis used improved computer codes which modeled the buoyancy effects inside the valve vaults and reduced both the magnitude and duration of temperatures associated with the MSLB with superheat. Thermal lag analyses were performed by SQN to show that the internal temperatures of critical components in required electrical equipment would not exceed their qualification temperatures before the completion of their safety functions. Structural adequacy of valve vault steel and concrete structures during the postulated event was demonstrated.

TVA expects to complete the necessary documentation and provide submittals to the Office of Nuclear Reactor Regulation (NRR), demonstrating the applicability of the SQN MSLB analysis outside containment to WBN by April 1990.

ENCLOSURE 2

LIST OF COMMITMENTS

- TVA expects to complete the necessary documentation and provide submittals to the Office of Nuclear Reactor Regulation (NRR), demonstrating the applicability of the SQN MSLB analysis outside containment to WBN by April 1990.