TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

August 17, 1984

WBRD-50-390/84-29 84 AUG 20 AM : 28
WBRD-50-391/84-26

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

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 - SECOND INTERIM REPORT

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. A first interim report was submitted on July 21, 1984. On July 18, 1984, NRC-OIE Inspector P. Fredrickson was notified concerning the subject deficiency, and a new submittal date for the second report was established. We expect to submit our next report on or about September 28, 1984. 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

L. M. Mills by RHS

L. M. Mills, Manager
Nuclear Licensing

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

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta Georgia 30339

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ENCLOSURE

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

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 uncovery. Inclusion of 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 WBN and must be considered in regard to qualification of class 1E electrical equipment and safety-related mechanical equipment.

Interim Progress

TVA has completed an analysis to revise the environmental profile resulting from a postulated MSLB in the valve vault room. The profiles were developed utilizing the only currently available mass-energy blowdown data that include the effect of steam superheating due to steam generator tube uncovery during an MSLB; i.e., the Westinghouse reanalysis of an MSLB inside containment for Catawba Nuclear Station. TVA believes the use of the Catawba data for WBN is appropriate due to the two plants' design similarities. Additionally, TVA believes that the application of the release rates for an MSLB inside containment conservatively bounds the release rates for a WBN valve vault MSLB.

The TVA analysis utilizing the Catawba data that predicted a peak environmental temperature of 446°F which exceeds the temperature used for equipment qualification and structural design calculations. As a result, a comprehensive evaluation of the effects of the increased temperature upon the plant's capability to achieve controlled hot standby was performed. The evaluation process consisted of (1) a heat transfer analysis of the structural steel and concrete to determine peak temperature and/or worst case thermal gradients, (2) a subsequent failure evaluation of the structural steel and concrete in the valve vault, (3) an examination of the effects of the increased temperature profile upon the environmental qualification of 1E electrical equipment and safety-related mechanical equipment, and (4) a safety evaluation of plant safe shutdown capability.

TVA's evaluation of the postulated MSLB in the valve vault indicated that (1) the structural steel will remain intact even though some localized yielding will occur, (2) the valve vault concrete may undergo some localized damage with some spalling but its structural integrity will not be affected, and (3) all safety-related mechanical and class 1E electrical equipment (with the exception of postaccident monitoring (PAM) instruments) will perform all their required functions before temperatures rise to levels which invalidate the environmental qualification threshold of the equipment. Additionally, it was determined that equipment which could fail when its environmental

qualification temperature is exceeded will fail in a position not adversely affecting plant safety. The PAM instrumentation which is required to function during and after the event will either be protected from the valve vault environment by the installation of thermal protection boxes or relocated to a milder environment. This work will be handled under engineering change notices (ECNs) 5019 and 5020.

In summary, TVA has determined that the WBN plant can achieve controlled hot standby during a postulated MSLB in the valve vault. This conclusion is based upon the safety evaluation which uses data obtained from a Westinghouse reanalysis of an MSLB inside containment for Catawba. Even though the application of this reanalysis to an MSLB in the valve vault is considered conservative, TVA has requested the vendor to perform an analysis to confirm the safety evaluation. If warranted, TVA will revise the valve vault environmental profiles and the remainder of the evaluation upon receipt of the vendor's analysis.