

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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January 13, 1986

WBRD-50-390/84-03
WBRD-50-391/84-03

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:

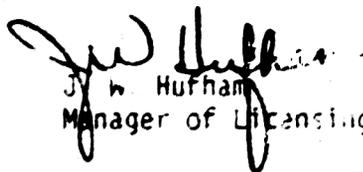
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - PEAK CONTAINMENT TEMPERATURE -
WBRD-50-390/84-03, WBRD-50-391/84-03 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Caudle Julia on December 20, 1983 in accordance with 10 CFR 50.55(e) as NCR WBN NEB 8335. Interim reports were submitted on January 27, April 3, May 22, and October 17, 1984, and on April 3, 1985. A letter requesting extension of this report to December 31, 1985 was submitted on November 19, 1985. We consider 10 CFR Part 21 applicable to this deficiency. Delay in submittal of this report was discussed with Al Ignatonis on January 6, 1986.

If you have any questions, please get in touch with R. H. Shell at FTS 658-2688.

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. 20535

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
PEAK CONTAINMENT TEMPERATURE
NCR WBN NEB 8335
WBRD-50-390/84-03, WBRD-50-391/84-03
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

In response to an NRC question on Duke's Catawba FSAR, Westinghouse has analyzed the effects of superheated steam, when the steam generator tubes uncover, subsequent to a main steam line break (MSLB). Previously, the highest calculated containment temperature for Catawba was 327°F; the new analysis, which Westinghouse had independently verified, resulted in a peak temperature of 383°F in the lower containment and 345°F in the dead-ended compartment. The present peak containment temperature for Watts Bar Nuclear Plant (WBN) is also 327°F and the results of the new analysis are believed to apply to WBN and must be evaluated with regard to qualification of IE electrical equipment, safety-related mechanical equipment, thermal growth of containment, protective coatings, and possibly others.

Safety Implications

The containment temperature calculations by Westinghouse which caused the initiation of nonconformance report (NCR) WBN NEB 8335 considered the effect on steam flow past uncovered tubes in the steam generators because of a steam line break inside containment. Per this analysis, the steam became superheated and initially resulted in higher containment temperatures than those used for design and reflected in the FSAR containment analyses. These higher postulated temperatures had the potential to affect the environmental qualification of equipment and coatings inside containment and the integrity of containment and rigid penetrations attached to the containment.

Corrective Action

An analysis of the worst case MSLB at WBN considering the effects of additional superheat as the steam generator tubes uncovered was performed for TVA by Westinghouse. This analysis was sent to NRC-NRR on June 18, 1985. The analysis showed that the effects of superheat were offset by model changes made to the LOTIC III computer code and that the present FSAR temperature curves bound the temperature profile generated with the new model. The revised analysis showed a peak temperature of 312°F compared to a peak temperature of 327°F taken from the FSAR analyses. The principal change to the code was to model the cooling effect of ice melt water exiting from the ice condenser drains. In support of this effort, Westinghouse submitted four topical reports to NRC-NRR on November 27, 1985. WCAP-10986, 10987, 10988, and 10989 describe the model changes to the LOTIC III computer code, data and test results from the ice condenser drain test program, and a containment analysis using the COBRA NC computer code. No changes to plant systems, procedures, or technical specifications are required as a result of this nonconformance report (NCR).