TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

April 16, 1982

BLRD-50-438/82-01
BLRD-50-439/82-01

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - INCORRECT DESIGN TEMPERATURES FOR REACTOR BUILDING COOLER VALVES - BLRD-50-438/82-01, BLRD-50-439/82-01 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector D. Quick on December 8, 1981 in accordance with 10 CFR 50.55(e) as NCR BLN BLP 8129. This was followed by our first interim report dated January 6, 1982. Enclosed is our final report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

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

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
INCORRECT DESIGN TEMPERATURES FOR REACTOR BUILDING COOLER VALVES
NCR BLN BLP 8129
BLRD-50-438/82-01, BLRD-50-439/82-01
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

The essential raw cooling water design criteria diagram (3GW0653-KE-04 through R5) specified a design temperature of 200°F for discharge headers in the reactor building cooler loop. This design temperature was based on reactor building coolers having fouled tubes which was considered worst case conditions for flow and pressure drops. Discharge temperature conditions with clean tubes were not considered. Subsequent correspondence with the reactor building cooler vendor in conjunction with raw cooling water corrosion studies necessitated reviewing all assumptions such as fouling factors, flow requirements versus heat loads, etc., to determine maximum pressure drops. This study revealed that under certain conditions the exit temperature could be as high as 275°F. Since the design condition was specified as 200°F, this was in violation of ASME Section III, NA-2142, which requires "considering all system operating conditions anticipated or postulated to occur during the intended service life of the component." Consequently, the following 12 valves were procured with incorrect design temperatures.

1KE-VTAB-272A	1KE-VUAB-275A
1KE-VTAB-314B	1KE-VUAB-316B
1KE-VTAB-327B	1KE-VUAB-330B
2KE-VTAB-272A	2KE-VUAB-275A
2KE-VTAB-314B	2KE-VUAB-316B
2KE-VTAB-327B	2KE-VUAB-330B

The use of the worst case (fouled tubes) to determine the discharge temperature while ignoring the effect of clean tubes was the cause of this deficiency.

Safety Implications

Since the valves and associated piping have been determined to be acceptable for use as is (see Corrective Action), this situation would not have affected safe operation of the plant if it had remained undetected.

Corrective Action

TVA has revised the essential raw cooling water design criteria diagram to reflect a 275°F design temperature in the reactor building cooler loop discharge. The valves affected by the temperature change

have been qualified by the vendor, and TVA will proceed with having the vendor change any necessary documentation. The TVA valve procurement documents have been changed to reflect the 275°F design temperature. The pipe schedule of the piping involved was checked for the higher design temperature and found to be sufficient. The pipe schedule calculations were modified to reflect the higher temperature.

To prevent recurrence of this deficiency, TVA will reinstruct designers to consider all system operating modes in the preparation of design criteria diagrams by June 1, 1982.

This deficiency is not applicable to other TVA nuclear plants since only Bellefonte takes credit in the safety analysis for the combination of RBC/ERCW System for containment heat removal.