

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

June 7, 1984

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BLRD-50-438/82-65

BLRD-50-439/82-58

U.S. Nuclear Regulatory Commission
Region II

Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

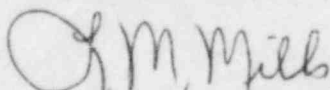
BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - CORROSION IN HIGH PRESSURE FIRE
PROTECTION SYSTEM - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Don Quick on September 3, 1982 in accordance with 10 CFR 50.55(e) as NCRs BLN MEB 8206 and WBN MEB 8201. This was followed by our interim reports dated October 4, 1982 and May 25, 1983. A related deficiency has also been reported under 10 CFR 50.55(e) on the Essential Raw Cooling Water System as NCRs BLN NEB 8010 and WBN NEB 8017. Please note that TVA separated these NCRs and submitted a final report for Watts Bar Nuclear Plant on September 16, 1983. Enclosed is our final report for Bellefonte. A several week delay of this submittal was discussed with NRC-OIE Inspector P. E. Fredrickson on May 15, 1984.

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 Licensing

Enclosure

cc (Enclosure):

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

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

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
CORROSION IN HIGH PRESSURE FIRE PROTECTION SYSTEM
NCR BLN MEB 8206
BLRD-50-438/82-65, BLRD-50-439/82-58
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

The high pressure fire protection (HPFP) system contains carbon steel piping. Experience indicated that such piping exposed to raw water may experience corrosion to such a degree that pressure drops and flows fall outside design conditions in safety-related sections after some period of operation.

The HPFP system was designed in accordance with standard industry practice. Our experience has shown that, in actuality, corrosion in carbon steel piping used in raw water systems causes greater pressure drops than would have been calculated using standard industry practice.

Safety Implications

Functionability of safety-related systems or components could be jeopardized in a fire if, due to inadequate water flow, the high pressure fire protection system did not perform its intended function of prompt extinguishment.

Corrective Action

TVA has completed the corrosion analysis of the HPFP system in safety-related areas in accordance with the criteria stated in Mechanical Design Standard DS-M.3.5-1, "Pressure Drop Calculations for Raw Water Piping and Fittings." Two of the areas analyzed, the Auxiliary Building roof hoses and fire zone 8, have the potential to be adversely affected from a fire protection standpoint sometime during the life of the plant with the Auxiliary Building roof hose area having a significantly greater potential deficiency than fire zone 8. Based on the results of this corrosion analysis, the following specific actions are being taken:

- I. Testing shall be established for the roof hoses on the auxiliary building as stated in FSAR Section 9.5.1.1, item 6. The results of the testing on the Auxiliary Building roof hoses will be used as representative of the total HPFP system. This is conservative since the pressure losses for the required flows is significantly greater for the Auxiliary Building roof hoses than any other area protected by the HPFP system. For this reason, fire zone 8 will not be tested. The existing piping and hose connections on the roof will be used for this testing.
- II. Testing will be performed every three years. The testing will be used to determine the rate of system degradation and to verify continued system adequacy.

III. The test requirements in I above have been added to the preoperational test program to verify the adequacy of the system at plant start up. The results of this preoperational test program will establish the baseline data to monitor any future changes in the performance of the system.

System piping will be replaced or other corrective action taken if and/or when problems are identified during preoperational testing and/or future testing.

To prevent recurrence of this condition, TVA has issued Mechanical Design Standard DS-M.3.5.1 which requires that all future pressure drop calculations account for corrosion in raw water piping systems. All safety-related and fire protection raw water piping systems at Bellefonte and other nuclear plants have been or are in the process of being evaluated using the criteria stated in DS-M.3.5.1. Appropriate corrective actions will be implemented as required based on the results of these evaluations and/or field testing programs.