

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

January 5, 1983

BLRD-50-438/81-07
BLRD-50-439/81-07

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:

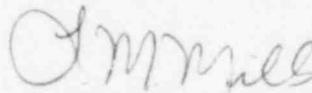
BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - CORROSION OF CARBON STEEL PIPING -
BLRD-50-438/81-07, BLRD-50-439/81-07 - EIGHTH INTERIM REPORT

The subject nonconformance was initially reported to NRC-OIE Inspector F. S. Cantrell on December 30, 1980, in accordance with 10 CFR 50.55(e) as NCR BLN NEB 8010. This was followed by our interim reports dated January 29, May 22, September 23, November 12, and December 21, 1981 and March 2 and August 11, 1982. Enclosed is our eighth interim report. This nonconformance has also been reported for Sequoyah and Watts Bar Nuclear Plants. We expect to submit our next report by October 28, 1983.

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

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ENCLOSURE
BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
CORROSION OF CARBON STEEL PIPING
NCR BLN NEB 8010
BLRD-50-438/81-07, BLRD-50-439/81-07
10 CFR 50.55(e)
EIGHTH INTERIM REPORT

Description of Condition

It has been found that the original criteria for the use of carbon steel piping in raw water systems at TVA nuclear plants may not be adequate. Corrosion has been found to cause greater than predicted pressure drops when pipes are sized according to standard industry practice. In addition, the corrosion can cause a thinning of the pipe wall which may be in excess of the minimum wall thickness considered in the design of the systems. This condition could affect all raw water systems with carbon steel piping, such as the Essential Raw Cooling Water (ERCW) System, High Pressure Fire Protection System, and the pump room and oil coolers for the centrifugal charging pumps, the safety injection pumps, and the containment spray pumps. Also, most electrical board and room air-conditioning units use carbon steel piping. The High Pressure Fire Protection System is being handled separately under nonconformance report (NCR) BLN MEB 8206.

The problem of corrosion has been the subject of considerable study at TVA. A brief history of TVA's investigation of this matter was included in our first interim report.

Interim Progress

TVA has completed the reevaluation of the Bellefonte Nuclear Plant (BLN) ERCW System in accordance with the criteria stated in TVA's Division of Engineering Design (EN DES) Design Guide No. DG-M3.5.1, "Pressure Drop Calculations For Raw Water Piping and Fittings" and found that changes must be made to ensure operability of the system over the plant life. These changes will involve applying a cement mortar lining to the existing carbon steel yard piping, changing selected pipe segments within the buildings to stainless steel, and requalifying certain components for lower flows as discussed in the seventh interim report. All design-related activities are scheduled to be completed by the next report.

To ensure that pressure drop calculations for future piping systems at BLN and other TVA nuclear facilities are performed in accordance with the criteria stated in DG-M3.5.1, TVA has upgraded the design guide to a design standard, DS-M3.5.1. Classification as a design standard will ensure that all new pressure drop calculations comply with the criteria as stated in the design standard.

As a part of TVA's investigation of corrosion of carbon steel piping detailed in the report entitled "Corrosion in Carbon Steel Raw Water Piping" (attached to the letter from L. M. Mills to J. P. O'Reilly dated August 25, 1981, for Sequoyah Nuclear Plant NCR SQN NEB 8035), the average wall reduction of all samples was measured and found to be less than 0.040 inch, except for a very few samples where exterior corrosion predominated. The design of all raw water piping on BLN is such that an average wall reduction of 0.040 inch is acceptable. Therefore, the effects of interior corrosion on the average wall reduction has been accounted for in the design of the systems. Localized corrosion of piping may result in leaks in the systems. However, the anticipated rate of leakage would be quite small in comparison to the rated flow of the system, and TVA plans to inspect and/or hydrotest the piping in accordance with ASME Section XI requirements and will identify and repair any such leaks on a periodic basis.