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TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401  
400 Chestnut Street Lower II

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June 21, 1984

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:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - FAILURE OF MAIN STEAM LINES  
BECAUSE OF MAIN FEEDWATER OVERFILL - NCR BLN NEB 8004 - THIRTEENTH  
INTERIM REPORT

On March 19, 1980, Bruce Cochran, NRC-OIE Region II, was informed that the subject nonconformance was determined to be reportable in accordance with 10 CFR 50.55(e). This was followed by our interim reports dated April 17, September 23, and December 29, 1980; June 25 and December 28, 1981; March 31, August 27, and November 18, 1982; March 24, July 14, and November 18, 1983; and February 27, 1984. Enclosed is our thirteenth interim report. We expect to submit our next report by December 18, 1985. We consider 10 CFR Part 21 to be applicable to this nonconformance.

If you have any questions concerning this matter, please get in touch with R. H. Shell at FTS 858-2474.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*L. M. Mills*  
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

Babcock & Wilcox Company  
Attention: Mr. H. B. Barkley  
P.O. Box 1260  
Lynchburg, Virginia 24505

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2  
FAILURE OF MAIN STEAM LINES BECAUSE OF MAIN FEEDWATER OVERFILL  
NCR BLN NEB 8004  
10 CFR 50.55(e)  
THIRTEENTH INTERIM REPORT

Description of Deficiency

A preliminary safety concern, PSC 35-79, was initiated within B&W, Lynchburg, Virginia, which presents the concern that a potential exists for overfilling steam generators by excessive addition of main feedwater (MFW) or auxiliary feedwater (AFW).

Excessive feedwater addition, as used here, is defined as a condition which would exist if feedwater (main or auxiliary) is continually added to the steam generators in an unplanned fashion at a rate greater than the core heat generation capability for converting it to steam. Overfill, the condition addressed in this preliminary safety concern, may be defined as a limiting case of excessive feedwater addition which allows liquid spillage into the steam lines.

It is estimated that the time to overfill the integral economizer once-through steam generators (IEOTSG) provided on the Bellefonte Nuclear Plant is approximately 2 to 4 minutes with MFW and between 7 to 15 minutes with AFW.

Potential results of overfill could be:

1. Steam line deformation and failure because of water accumulation.
2. Steam generator blowdown because of steam line failure with the potential for core return to power from a safe shutdown condition, excessive steam generator tube stress, exceeding reactor vessel NDT limits, or containment overpressurization.

Interim Progress

In our previous report, TVA stated that B&W does not believe an AFW overfill protection system is required and that this action would not be pursued. However, upon reconsideration, TVA has concluded that this decision warrants further investigation and thus, is still reviewing it.

Therefore, the corrective action for this NCR undertaken by B&W is to provide a design for a safety-grade MFW overfill protection system for the steam generators. B&W has proceeded to provide such a MFW overfill protection system via the BLN upgrade "Do It Now" (DIN) program item 702. This program is the TVA-instituted program to meet post-Three Mile Island (TMI) upgrade requirements. B&W has submitted to TVA a field change package (FCP) for implementation of DIN 702; however, this FCP has not been approved and is currently undergoing a substantial design change by B&W. The percent completion of this corrective action is less than 35 percent.

TVA has reviewed and approved the analysis which shows that the main steamline piping can withstand the limited MFW overfill event that is postulated to occur with the overfill protection system in place. The analysis is acceptable, and TVA's Nuclear Engineering Support Branch has received verification and approval of the final analysis by the Civil Engineering Support Branch (CEB). CEB has completed the verification and approval of all six analysis problems associated with this item. (Problems N4-1(2)SM-A, C, K, L, M, and N are all complete.) A copy of the analysis has been sent to B&W for their information and review.

Outstanding action items associated with this deficiency are; (a) TVA's review and approval of B&W's FCP for MFW overfill protection system, and (b) completion of TVA's engineering change notice (ECN) related to this change.