

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

January 14, 1983

BLRD-50-438/81-31  
ELRD-50-439/81-34

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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 - DEFICIENT PIPE SUPPORTS -  
BLRD-50-438/81-31, BLRD-50-439/81-34 - SECOND REVISED FINAL REPORT

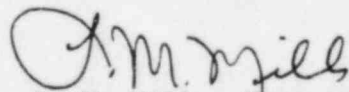
The subject deficiency was initially reported to NRC-OIE Inspector P. Taylor on April 6, 1981 in accordance with 10 CFR 50.55(e) as NCR BLN BLP 8109. This was followed by our first interim report dated May 6, 1981, our final report dated September 3, 1981, our revised final report dated September 28, 1981, our first supplemental report dated January 11, 1982, and our final supplemental report dated June 21, 1982.

As discussed with NRC-OIE Inspector Linda Watson on December 30, 1982, the date of December 1982 for completion of corrective actions indicated in our revised final report on this matter was not met. In addition, a portion of our corrective actions has changed. We are therefore submitting a revised response.

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  
DEFICIENT PIPE SUPPORTS  
----- NCR BLN BLP 8109  
BLRD-50-438/81-31, BLRD-50-439/81-34  
10 CFR 50.55(e)  
SECOND REVISED FINAL REPORT

### Description of Deficiency

The Bellefonte Alternate Analysis Criteria imposes a seismic displacement limit of one inch for piping. It was not clear to TVA that seismic restraints were properly designed to allow for seismic displacement of the piping. It was hypothesized that the pipe might not have sufficient clearance to move in a direction that is specified as unrestrained without contacting the support structure. The alternately analyzed piping supports have not been analyzed for any loading which would cause a displacement of this nature.

In addition, TVA hanger personnel did not know the meaning of the symbol (w). This was noted in inspection report 81-14 and was identified as Violation 81-14-02.

### Safety Implications

Should pipe supports be inadequately designed or installed, loading configurations resulting from accident conditions could result in support failures. The severity of safety implications depends on the proportions of any failure(s). Where the supports failed in such a manner as to directly or indirectly cause a failure of a safety-related system or piping, the safety of operations of the plant could be adversely affected.

### Corrective Action

Before this NCR was identified, the NRC resident inspector at BLN cited TVA with a Severity Level V Violation (81-14-02). The violation concerned the symbol (w), which is used in the movement column on ITT Grinnell (ITT) support detail design sheets. TVA support installation engineers were confused as to the meaning of this symbol.

In review of the support detail design sheets, an additional concern was identified by TVA piping analysts. This concern arose when the adequacy of the support design for possible seismic movement of alternately analyzed pipe was questioned. It was not clear that the support design was adequate for all possible seismic movements (in unrestrained directions) for the alternately analyzed pipe. The subject NCR was written as a result of this additional concern. TVA discussed the above violation and the piping analysts' concern in a telephone conference with the resident inspector on July 30, 1981. In that conference, the inspector agreed that the response to the violation and the response to the subject deficiency should be combined. Therefore, TVA discusses both conditions, below.

Violation 81-14-02

Because TVA Hanger Installation personnel did not know the meaning of the symbol (↗), ITT support designers were consulted as to its meaning. The designers stated that, per ITT engineering instructions, if the movement column on the table of support loads indicates anything other than zero, then a 1/4-inch movement or the movement indicated must be assumed in the unrestrained direction (see Appendix A), and a line drawn through the movement box on the support sketch form. The symbol (↗) indicates a 1/4-inch movement in unrestrained directions only. For the directions in which a support is a rigid restraint, the movement will be zero.

All personnel required to know the meaning of the symbol (↗) have been informed. TVA has issued construction specification No. N4C-913, "Support and Installation of Piping Systems in Category I Structures," which requires that all piping in category 1 structures be inspected for possible interferences resulting from pipe movements. This inspection is an ongoing program required for final system acceptance. When this inspection is completed, it will ensure that any possible interference problems which may have resulted from TVA hanger personnel not knowing the meaning of the symbol (↗) have been resolved. TVA has identified the support designs which may have been affected by this problem. A total of 3,150 support design drawings were determined to require review. This review has revealed that supports shown on 2,693 drawings are acceptable as is. The remaining 457 drawings must undergo further evaluation before a determination of support acceptability can be made. This evaluation will be completed by June 30, 1983.

NCR BLN BLP 8109

In regard to the concern about the adequacy of support design for alternately analyzed pipe, TVA has determined that the Bellefonte Nuclear Plant Design Criteria N4-60-D717, "Design of Safety-Related Piping Supports and Supplemental Steel," is adequate for use in the design of supports for piping analyzed by the alternate criteria and does not need to be revised.

TVA determined that the support design criteria and the design drawings are adequate after reviewing the computer analyses of seismic events obtained from EDS Nuclear, Incorporated (the developer of the alternate criteria).

The Bellefonte alternate criteria contains specific guidelines for placement of unidirectional supports. The review showed that at these locations the maximum seismic deflections in the unrestrained directions were negligible.

Therefore, neither the Bellefonte Alternate Design Criteria nor the Bellefonte Nuclear Plant Design Criteria N4-60-D717, "Design of Safety-Related Piping Supports and Supplemental Steel," has been violated. All seismic restraints have been designed so as to allow sufficient clearance to move in an unrestrained direction.

APPENDIX A  
ITT GRINNELL ENGINEERING INSTRUCTIONS  
INSTRUCTION NO. 10, R6 OF 7-28-80  
"SPECIAL REQUIREMENTS"  
SECTION J

Friction

1. If the movement column on the table of support loads indicates anything other than zero, then a 1/4-inch movement or the movement indicated must be assumed in the unrestrained direction. When a 1/4-inch movement is assumed, draw a line through the movement box on the rough sketch form. Therefore, friction should be considered.
2. Friction shall be dynamic and will not require evaluation unless the forced displacement is 0.0625 inches or greater. The coefficient will be 0.33 for steel to steel regardless of composition and/or surface conditions under load. For restrained directions, friction is to be assumed as nonexistent regardless of construction gaps.