

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

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August 10, 1984

BLRD-50-438/82-39

BLRD-50-439/82-35

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 - DEFICIENT PIPE SUPPORTS -  
BLRD-50-438/82-39, BLRD-50-439/82-35 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on December 15, 1981 in accordance with 10 CFR 50.55(e) as NCR BLN BLP 8130. This was followed by our interim reports dated June 21, 1982 and January 24 and July 14, 1983, and January 31, 1984. Enclosed is our final report. A several week delay of this submittal was discussed with Inspector P. E. Fredrickson on July 25, 1984.

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

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

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Institute of Nuclear Power Operations  
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## ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2  
DEFICIENT PIPE SUPPORTS  
BLRD-50-438/82-39, BLRD-50-439/82-35  
NCR BLN BLP 8130  
10 CFR 50.55(e)  
FINAL REPORT

### Description of Deficiency

An error was discovered in the thermal movement column of a support design load drawing (drawing No. 3BH04 19-NV-04). A zero was entered in the thermal movement column for the unrestrained directions of about 20 supports listed on this drawing when, in fact, there is a small amount of thermal pipe movement in these unrestrained directions. Because zero was listed as the thermal pipe movement of these supports, a frictional load was not included in the design of these supports.

An incorrect assumption concerning the significance of small thermal movements was made by the piping analysts. This was caused by an inadequate understanding of the conventions agreed to by TVA and ITT Grinnell used for defining thermal movements of less than 1/4" on tables of support loads (use of NA, blank, etc.). The use of these conventions led to a lack of due concern on the part of piping analysts for the effects of small thermal movements on support design.

### Safety Implications

The failure to consider frictional loading in the design of pipe supports could, theoretically, cause the affected support to fail. Since some of the affected supports are used on primary safety-related systems, a failure of these supports could contribute to a failure of safety-related piping and, therefore, be a condition adverse to the safe operation of the plant.

### Corrective Action

All tables of support loads for alternately analyzed piping with ITT Grinnell-designed supports were inspected to identify all support points having a zero listed as the thermal movement in the unrestrained directions. The analysis calculations were reviewed to determine actual thermal movements.

The determination was made, based on paragraph J.2 of ITT Grinnell Engineering Instruction No. 10, that frictional loading needs to be evaluated only for those supports at locations where the thermal movement in the unrestrained directions equals or exceeds 1/16". In order to minimize the number of supports requiring detailed evaluation, the tables of support loads were reviewed and revised to identify support load thermal movements equaling or exceeding 1/16" in the unrestrained directions.

Approximately 382 supports were identified as requiring a detailed evaluation. As a result of this evaluation, approximately 62 support detail drawings were revised. Of this number, 39 supports require construction rework.

The rework required is documented on engineering change notice 2104 and will be complete by March 7, 1987.

To prevent recurrence, TVA has issued a memorandum to all affected piping analysts instructing them to enter appropriate numerical data on future tables of support loads.