

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

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January 25, 1984

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 - SECOND REVISED RESPONSE TO VIOLATION
50-438, 50-439/81-33-08 - COLD SPRUNG PIPE

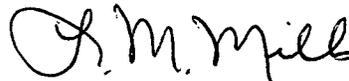
TVA had submitted our original response to F. S. Cantrell's letter dated January 26, 1982, report numbers 50-438/81-33, 50-439/81-33, concerning activities at the Bellefonte Nuclear Plant which appeared to have been in violation of NRC regulations on March 11, 1982. The revised response to this violation was submitted June 17, 1982. As discussed with P. E. Fredrickson by telephone on December 2, 1983, enclosed is our second revised response to the citation.

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

To the best of my knowledge, I declare the statements contained herein are complete and true.

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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BELLEFONTE NUCLEAR PLANT UNITS 1 AND
COLD SPRUNG PIPE
SEVERITY LEVEL VI VIOLATION 50-438, 50-439/81-33-08
SECOND REVISED RESPONSE

Violation 438, 439/81-33-08

10 CFR 50, Appendix B, Criterion V and Tennessee Valley Authority (TVA) Final Safety Analysis Report, Section 17.1A.5, states in part: "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

Paragraph 7.5e of BNP-QCP-6.17 R2 states: "Rigid supports capturing the pipe shall be verified not to have the pipe cold sprung."

Contrary to the above, during February and March 1981, the resident inspector identified two areas in the Chemical Addition Boron Recovery System where piping sections had apparently been cold sprung due to installation of seismic supports. TVA completed their investigation of these areas in November and December 1981 and determined that the piping sections had in fact been cold sprung.

Admission or Denial of the Alleged Violation

TVA denies the alleged violation. The item cited by the NRC resulted from a conservative misinterpretation by BLN Construction (CONST) of a provision concerning cold springing in General Construction Specification G-43, "Support and Installation of Piping Systems." TVA's G-43 paragraph 2.6 states in part that cold springing is not permitted unless specified on design drawings. However, BLN CONST misinterpreted the term "cold spring" as used in G-43 and considered paragraph 2.6 applicable to the condition described by the resident inspector. The resident inspector noted this concurrence in his Description of Violation saying, "TVA . . . determined that the piping sections had in fact been cold sprung." Subsequent review by piping analysts in TVA's Civil Engineering Support Branch (CEB) and ASME Code experts in TVA's Nuclear Engineering Support Branch (NEB) has shown that the condition is not, in fact, "cold springing" as defined by the ASME Code and referenced in G-43 paragraph 2.6. Further, the condition cited by the inspector which may be more properly termed "preload on pipe supports" is not a safety concern and no rework of supports is required. The improper interpretation of G-43 by BLN CONST resulted in the erroneous admission of a violation by TVA, the incorporation of the pipe cold springing provision in site quality control procedure BNP-QCP-6.17, "Seismic Support Installation and Inspection," and imposed undue requirements on BLN CONST. It should also be noted that BNP-QCP-6.17 was erroneously issued to include the coldspring provision on April 13, 1981 in response to unresolved item 50-438/81-07-02 "Cold Springing of Pipe Runs" and resulted in rework of pipe supports which should not have been performed. This has become apparent as a result of a memorandum from the Bellefonte Design Project dated March 29, 1982, which clarified the intent of G-43 and provided guidance for evaluating the significance of pipe alignment on pipe and pipe supports.

The memorandum states in part that a reasonable temporary force may be applied to a pipe to position it for welding to an equipment nozzle and that this practice is not considered cold springing. The term cold spring has been improperly applied by BLN CONST to misalignment of pipe and supports and resulting preload in the pipe and supports when the two are forced to mate up. The ASME Code permits bending of a pipe provided minimum wall thickness and ovality requirements are met. The deformation or bending associated with misalignment is not a problem for the pipe.

Typical supports developed for small pipe qualified by alternate analysis were very conservatively designed. Design loads were based on allowable stress in the pipe, and deflection limits generally resulted in very low stress in the support. The mate-up force on typical supports is not a concern, but unsightly bends and sags should be avoided.

Cold springing is a process which the designer takes credit for in meeting equipment nozzle allowables. The ASME Code requires that if it is considered in design it must be specified to construction. Reference to cold spring in G-43 is a duplication since G-43 establishes nozzle protection procedures which prevent cold spring. The only practical application of cold spring is in large pipe such as the primary system and feedwater and steam lines where space and cost considerations prohibit bends and loops to increase flexibility. Large forces are required to induce the cold spring in these systems. The weight and stiffness of large pipe dictates the use of chain hoists, adjustable temporary supports, pry bars, etc. The large number of variables prohibits establishing rigid rules for pulling pipe into place.

In summary, the assembly procedures of G-43 establish good construction procedures which will minimize preload in pipe and on pipe supports. Although it is not stated in G-43, mechanical devices and adjustable supports must be used to position pipe for fabrication. If the assembly procedures of G-43 are followed, weld shrinkage stress, redistribution of load when temporary supports are removed, shift of load because of insulation and fluid weight, temperature change, etc., will cause the pipe to bind against a support. If rigid supports are used, this fact must be accepted. Minor plastic deformation during shakedown of the system will relieve these forces.

BLN CONST has eliminated the paragraph from BNP-QCP-6.17 which requires inspection for the misinterpreted term "cold spring." The procedure has been revised and issued. All requirements specified by G-43, including the clarified version of cold spring, will be adhered to strictly. Structural steel pipe supports will not be reworked to relieve forces induced from alignment of piping and supports. Therefore, in light of the clarification supplied by the referenced memorandum, TVA considers no item of noncompliance exists.

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