

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

APR 4 8:55 AM
March 30, 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 - RESPONSE TO VIOLATION
50-438/84-03-01, 50-439/84-03-01 - FAILURE TO FOLLOW PROCEDURES FOR
CONCRETE EXPANSION ANCHOR BOLTS AND PIPE SUPPORT INSPECTIONS

This is in response to R. C. Lewis' letter dated February 29, 1983, report numbers 50-438/84-03, 50-439/84-03 concerning activities at the Bellefonte Nuclear Plant which appeared to have been in violation of NRC regulations. We shall be submitting additional information on this violation by August 1, 1984. Enclosed is our response to the citations.

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

D S Kammer

D. S. Kammer
Nuclear Engineer

Enclosure

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

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
RESPONSE TO SEVERITY LEVEL IV VIOLATION
50-438/84-03-01, 50-439/84-03-01
FAILURE TO FOLLOW PROCEDURES FOR CONCRETE EXPANSION
ANCHOR BOLTS AND PIPE SUPPORT INSPECTIONS

Description of Deficiency

10 CFR 50, Appendix B, Criterion V, as implemented by TVA Bellefonte FSAR Section 17, paragraph 17.1.B.5, requires in part that activities affecting quality be accomplished in accordance with instructions, procedures, and drawings.

Bellefonte QCP-2.8, paragraph 6.3.3.4 requires that a washer shall be placed over the bolt. . . . The bolt shall then be driven down until the nut, washer, and attachment are in solid contact; Attachment Q, provides specified torque values for installed wedge anchors; Attachment D requires that installed wedge anchors shall be able to withstand the specified torques. QCP-6.17 provides requirements for hanger nonconformances. Construction specification G-43, Appendix A, specifies maximum gap tolerance for hanger installation.

Contrary to the above, between February 7-10, 1984, activities affecting quality were not being accomplished in accordance with documented procedures and drawings in that a reinspection of 32 installed wedge anchors, 14 installed self-drilling shell anchors and 2 pipe supports, revealed the following discrepancies from the documented requirements:

- (1) Washers were missing on 4 installed wedge anchors for hanger No. ONM-MPHG-0901.
- (2) One installed wedge anchor for hanger No. 2KC-MPHG-1023-R4 could not withstand a required torque value of 192 ft.-lb.
- (3) Eight of the 32 installed wedge anchors were undertorqued (i.e. the nut on the anchor turned during torque testing).
- (4) Rear bracket of the sway strut for hanger No. 2KC-MPHG-1322-sh 1-R0 had been disconnected.
- (5) Measured pipe gap exceeded the maximum gap tolerance for hanger No. OKC-MPHG-1378-R2.

TVA Response

1. Admission or Denial of the Alleged Violation

TVA will address each item of this violation separately.

1. TVA admits the violation occurred as stated.

2. TVA denies the alleged violation.

At the time of installation, the subject wedge bolt on support 2KC-MPHG-1023 had been torqued to the required value. The turning of the single wedge bolt that was found at the time of inspection can be attributed to the loss of preload in the wedge bolt. The purpose for torquing of wedge bolts is to preapply the maximum design load to the anchor. This assures that the inelastic slip of the anchor, when loaded to its maximum design load, will be minimized. The anchor preload resulting from the torque is not permanent. Creep of the concrete in the vicinity of the wedging devices will result in almost complete loss of preload with time. However, after preload is lost, the anchor deflection required to develop the maximum design load will only be that required to overcome the concrete creep that has occurred. TVA never intended for wedge bolt torques to be permanently reproducible. TVA's Division of Engineering Design (EN DES) nonconformance report (NCR) 2854 was written to document the NRC violation and request EN DES concurrence that the wedge bolt installation is acceptable to "use-as-is." TVA will revise G-32 by September 20, 1984, and BNP-QCP-2.8 by October 31, 1984, to provide design clarification that bolt torques are not required to be reproducible after relaxation. This will eliminate the past conservative practice by Division of Construction (CONST) to replace bolts in which the torque cannot be reproduced.

3. TVA denies the alleged violation.

The inability of TVA to reproduce the torque values on wedge bolts again can be attributed to relaxation of the bolt and adjacent concrete. The position of TVA with respect to the NRC concern is identical to Item 2 above. NCR 2943 was written to allow EN DES review and to provide concurrence that the anchors may be "use-as-is."

4. TVA admits the violation occurred as stated.

5. TVA denies the alleged violation.

At the time of installation of hanger OKC-MPHG-1378R2 the gaps did meet the allowable tolerances. The changing of these gaps is a result of construction testing and operation. This concern previously was identified by unresolved item 438-439/81-21-03, "Gaps in Seismic Pipe Supports," and was addressed by a memo from EN DES to CONST dated May 16, 1983. In part, the letter states, "It is not the intent of EN DES to require additional gap inspections once the total gaps are verified and documented in accordance with G-43 requirements. . . . In many cases, the gap will completely disappear during operation. . . . Revision 6 to G-43 indicates that pipe will shift in the support and the gap may open on one side and close on the other due to forces or expansion during construction."

These gap changes are a function of the load-deformation and thermal expansion properties of the material and support configuration and cannot be avoided. Further, the tolerances were established with full realization of these variations.

NCR 2855 was initiated to document the pipe gap condition and to obtain EN DES concurrence that the current configuration can be "use-as-is."

2. Reasons for the Violation

1. The absence of washers on the wedge bolts for hanger No. ONM-MPHG-0901 can be attributed to craft and quality control personnel not following procedure. This failure to follow procedure resulted from possibly inadequate instructions contained in BNP-QCP-2.8, "Bolt Anchors Set in Hardened Concrete." The acceptance criteria did not specifically address the requirement for inclusion of washers on wedge bolts.
4. The reason for the disconnection of the sway strut on support 2KC-MPHG-1322 sh. 1 was to facilitate construction activity in the adjacent area. The responsible steamfitter craftsmen failed to follow procedure in that engineering authorization was not obtained prior to disconnection of the sway strut.

3. Corrective Steps Taken And Results Achieved

1. NCR 2842 was written to correct the wedge bolts by requiring installation of washers and subsequent reinspection.
4. NCR 2843 was written to document this condition and require reinstallation of the sway strut and subsequent reinspection.

4. Corrective Steps Taken to Avoid Further Violations

1. TVA CONST will conduct a random survey to determine the extent of missing washers on wedge bolts. Any missing washers will be documented and corrected. TVA will provide the results of the survey and appropriate corrective action, as necessary, in our final response on this violation.

Additionally, BNP-QCP-2.8 will be revised to include the requirement for wedge bolt washers as acceptance criteria.

4. Steamfitter craft personnel have received a memorandum emphasizing that unauthorized work on QC accepted hangers could result in disciplinary action.

5. Date When Full Compliance Will Be Achieved

1. The results of the random survey will be provided by August 1, 1984. The revision to BNP-QCP-2.8 will be issued by May 4, 1984. Installation of washers on the wedge bolts in question (per NCR 2842) will be completed by May 31, 1984.
4. Full compliance on this item will be achieved by May 31, 1984.