

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

June 12, 1984

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BLRD-50-438/84-10
BLRD-50-439/84-09

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 -OVERTORQUED CONDUIT AND CONDUIT BOX
SUPPORT BOLTS - BLRD-50-438/84-10, BLRD-50-439/84-09 - REVISED FINAL
REPORT

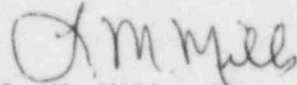
The subject deficiency was initially reported to NRC-OIE Inspector
P. E. Fredrickson on January 24, 1984 in accordance with 10 CFR 50.55(e) as
NCR 2734. This was followed by our interim report dated February 17, 1984
and our final report dated May 3, 1984. Enclosed is our revised final
report.

TVA does not now consider the subject nonconforming condition adverse to
the safe operation of the plant. Therefore, we will amend our records to
delete the subject nonconformance as a 10 CFR 50.55(e) item.

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, 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

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

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
OVERTORQUED CONDUIT AND CONDUIT BOX SUPPORT BOLTS
BLRD-50-438/84-10, BLRD-50-439/84-09
NCR 2734
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

While performing an inspection of attachment bolts on electrical conduit, conduit boxes, and cable trays, an electrical quality control (EQC) unit inspector found that some of the bolts had apparently been overtorqued. This was originally determined by measuring the necessary breakaway torque of the bolts (i.e., the torque necessary for the bolt to begin moving from its tightened-down position).

This appears to be due to the fact that TVA's Division of Engineering Design (EN DES) did not supply Bellefonte Nuclear Plant (BLN) Construction with a maximum torquing limit on some drawings for bolts used to install conduits in safety-related areas when these bolts were originally installed some time ago. Sometime after the original installation, EN DES reissued the drawings with a maximum torquing limit. Some of these bolts were found to be overtorqued when measured by these new values.

Safety Implications

Since this concern was originally identified, EN DES has determined that the bolts can be used-as-is providing bolt failure does not occur during tightening. (If bolt failure does occur, the bolts will be replaced.) This position is based on technical manuals and references used by TVA (references 1 through 3 listed below). Maximum stress is seen only at the time of initial torquing. If bolt failure does not occur at initial torquing, it will not occur because the working load on the bolt will never exceed its prestress load. Provided that there is no material failure and all other parameters have been properly specified, the torqued-down bolt will continue to function as designed. Therefore, this condition could not have adversely affected the safe operation of the plant. As such, TVA no longer considers this item to be reportable under 10 CFR 50.55(e).

In addition, breakaway torque has been determined not to be an adequate indication of the real torque in a bolt and should not be used as a measurement. Torquing values should be determined during initial installation only. Additional testing done by BLN Construction has resulted in the determination that breakaway torque cannot be used to confirm torque applied during installation. Based on this supporting information, BLN Construction will no longer utilize the follow-up breakaway torque method of checking conduit bolting.

- References:
1. "Helpful Hints . . . on Fastening with Screws, Nuts, and Bolts" by Russell, Burdsall, and Ward Bolt and Nut Company, Third Edition, page 7
 2. "Structural Steel Design" by Lambert Tall, Second Edition, pages 608-610
 3. 1979 Annual Book of ASTM Standards