

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower

October 24, 1983

BLRD-50-438/83-37

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 UNIT 1 - OFFSET OF DUTCHMAN IN THE INCORE
MONITORING SYSTEM - BLRD-50-438/83-37 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
P. E. Fredrickson on May 16, 1983 in accordance with 10 CFR 50.55(e) as
NCR 2352. This was followed by our interim reports dated June 15 and
August 18, 1983. Enclosed is our final report.

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: 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
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Atlanta, Georgia 30339

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNIT 1
OFFSET OF DUTCHMAN IN THE INCORE MONITORING SYSTEM
BLRD-50-438/83-37
10 CFR 50.55(e)
NCR 2352
FINAL REPORT

Description of Deficiency

The incore monitoring system (IMS) piping must be installed in precise lengths to assure proper positioning of the incore detector assemblies. The IMS pipe lengths are field adjusted by machining dutchman pipes to fit after the overall pipe lengths are gauged. The dutchmen for 9 of the 62 IMS pipes for unit 1 are offset relative to the longitudinal axis of the pipe runs. For six of the pipes, the offset exceeds the 1° limit in B&W's erection criteria by amounts ranging from 0°-11' to 1°-52'. The cause of these defects is poor workmanship during field installation. There have been no similar deficiencies in the past for Bellefonte and the unit 2 IMS piping has not yet been installed. There are no implications for other TVA plants.

Safety Implications

The incore detectors are placed in specific locations in the reactor core to monitor core performance. The data provides core power distribution and fuel burnup information. The IMS does not perform any protective or control function. However, Regulatory Guide 1.97 "Instrumentation for Light Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions" requires that instrumentation be provided for post-accident monitoring.

Close tolerances on the IMS piping installation are required to enable insertion and withdrawal of the incore detector assemblies. Had this condition remained uncorrected, insertion of some of the incore detectors could have been prevented or the detectors could have been damaged. Thus, the safe operation and/or post-accident monitoring of the plant could be adversely affected.

Corrective Action

Three of nine offset pipes (Nos. 10, 22, and 53) are acceptable as is since they do not exceed B&W's tolerance of 1 degree for angular mismatch. The other six offset pipes (Nos. 15, 25, 39, 44, 48, and 50) are to be realigned to bring them within the prescribed 1 degree tolerance by the selective deposition of weld filler metal on the pipe-to-dutchmen welds. The technique will first be demonstrated on a suitable mockup to establish process parameters necessary to achieve proper alignment.

If the selective deposition of weld filler metal fails to align the pipes within the prescribed 1 degree tolerance, the offset dutchmen will be removed, new dutchmen will be installed, and the angular mismatch will be verified not to exceed 1 degree.

When the problem was first noted, a Quality Control Investigation Report (QCIR) No. 2408 was written on September 26, 1979. The QCIR disposition was to use "as is" based on an engineering evaluation utilizing erection criteria in existence at that time. In June 1981, TVA received pipe erection criteria from B&W which prescribed the 1 degree maximum allowable offset. If the new criteria had existed at the time the problem was noted, the QCIR disposition would not have been to use "as is." The deviation from the June 1981 criteria was not discovered until May 1983 when the disposition to QCIR 2408 was reevaluated. Nonconformance report (NCR) 2352 was written because of the failure in June 1981 to verify that the piping was in compliance with the new erection criteria. The failure to implement the new criteria is an isolated case involving a person no longer employed by TVA. Therefore, no action is required to prevent recurrence.

All TVA action will be completed by January 1, 1984.