TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

August 27, 1981

BLRD-50-438/81-36
BLRD-50-439/81-39

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - FAULTY WELDS ON MIRROR INSULATION SUPPORT STEEL - BLRD-50-438/81-36, BLRD-50-439/81-39 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on May 11, 1981 in accordance with 10 CFR 50.55(e) as NCR 1449. This was followed by our first interim report dated June 10, 1981. Enclosed is our final report. We consider 10 CFR Part 21 applicable to this deficiency.

If you have any questions concerning this matter, please get in touch with D. L. Lambert at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc: Mr. Victor Stello, Jr., Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
FAULTY WELDS ON MIRROR INSULATION SUPPORT STEEL
BLRD-50-438/81-36, BLRD-50-439/81-39
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

The insulation surrounding the reactor vessel is supported by a steel framework supplied by Mirror Insulation. While installing the reactor vessel bottom head insulation support steel, it was discovered that practically all of the weld preparations for field welding and vendor-made welds on these structures were faulty. This condition was caused by the steel supplier's failure to fabricate the support structures in accordance with drawing requirements and the American Welding Society (AWS) code and by inadequate inspection by Babcock and Wilcox (B&W) and their insulator subcontractor (Mirror Insulation).

The weld preparations were either not prepared in accordance with the vendor's drawings or were omitted. The vendor welds do not meet the visual acceptance criteria of the AWS D1.1-77 structural steel code. The defects include spatter, arc strikes, undercut welds, craters, porosity, and undersize or incomplete welds.

These deficiencies should have been discovered before B&W released the structures for shipment from its subcontractor's (Mirror Insulation) plant.

B&W also failed to provide TVA's inspector the opportunity to perform source inspection as required by the contract.

Safety Implications

If the condition had remained uncorrected and there was a safe shutdown or design basis earthquake, the faulty vendor welds could fail. If these welds were to fail, the insulation support structure could collapse, which could break the incore monitoring piping coming from the bottom of the reactor vessel, resulting in a LOCA.

Corrective Action

All vertical welds that were not properly weld prepared and/or welded will have the structural steel joint welds ground and properly prepared before rewelding. Penetration welds will be properly made to ensure structural adequacy. After final welding and cleaning, structural steel will be repainted in accordance with specification and drawing requirements, and then inspected to original requirements. TVA will complete these corrective actions by January 5, 1982.

To prevent recurrence, Mirror Insulation has added inspections at their support steel supplier's plant, and B&W is increasing their inspections at Mirror Insulation before shipment.

An investigation has been made which has determined that there have been no similar deficiencies to date for insulation support steel fabricated for TVA plants preceding Bellefonte. Support steel for the balance of insulation at Bellefonte and TVA plants later than Bellefonte has not yet been fabricated.