

80-003-031  
400 Chestnut Street Tower II

June 2, 1981

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:

HARTSVILLE NUCLEAR PLANT UNITS A1, A2, AND B1 - REPORTABLE DEFICIENCY -  
RPV SHIELD WALL WELD DEFICIENCIES (NCR'S HNP-A-087, HNP-A-108, HNP-A-109,  
HNP-A-115, SX-19)

Initial notification of the subject deficiency was made to R. W. Wright,  
NRC-OIE, Region II, on February 15, 1980. The first, second, third, and  
fourth interim reports were submitted on March 13, May 19, September 24,  
and December 22, 1980, respectively. In compliance with paragraph  
50.55(e) of 10 CFR Part 50, this is the final report on the subject  
deficiency. We consider 10 CFR Part 21 applicable to this  
nonconformance. If you have any questions, please call Jim Domer at FTS  
857-2014.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*L. M. Mills*  
L. M. Mills, Manager  
Nuclear Regulation and Safety

Enclosure

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



IE27  
5/11

8106290

340

5

HARTSVILLE NUCLEAR PLANT  
RPV SHIELD WALL - WELD DEFICIENCIES  
NCR'S HNPA-087, HNPA-108, HNPA-109, HNPA-115, SX-19  
10CFR50.55(e) REPORT NO. 5 (FINAL)

On February 15, 1980, TVA informed NRC-OIE, Region II, Inspector, R. W. Wright, of a potentially reportable condition under 10 CFR 50.55(e) regarding welds of questionable quality on the reactor pressure vessel (RPV) shield wall structure supplied by Industrial Engineering Works (IEW), Trenton, New Jersey. Interim reports were submitted on March 13, May 29, September 24, and December 22, 1980. This is the final report on this deficiency.

Description of Deficiency

This deficiency was discovered when TVA was making repairs on the unit A1 RPV shield wall structure per NCR HNPA-059 (not significant). NCR HNPA-059 concerns the mismatch of RPV shield wall stiffeners where the stiffeners attach to the skin plate between tier one and tier two. There are 48 stiffener-plate-to-skin-plate welds per tier, each approximately 12 feet long. The backing bar was removed from approximately 12 inches in order to properly align the stiffener bars for welding. However, when the backing bar was removed, it was observed that a weld between a vertical stiffener and shell plate had an area of lack of penetration, slag, and lack of fusion. TVA removed more backing bars in order to examine other welds. Of the initial 25 welds inspected, 17 were found to be of unacceptable quality. The removal of all backing bars on tier one and tier two disclosed that all welds exhibited areas of poor quality.

TVA's further investigation of the condition revealed a similar defect on the unit A2 structure. Inspection of the unit B1 shield wall which had not been shipped to TVA revealed deficient welds also. Additionally, TVA found slugged welds on tier 3 of the unit A1 shield wall.

Safety Implications

If the faulty welds performed by IEW had not been detected, the structural integrity of the RPV shield wall could have been jeopardized. This condition could have endangered the safe operation of the plant.

Corrective Action

All backing bars between stiffener and shell plates in the unit A1 and A2 structure were removed. A visual inspection of the root of the weld was performed per the AWS Code. Defects detected by visual inspection have been excavated to the extent that welds are acceptable per AWS visual inspection acceptance criteria. Excavated areas were repaired by welding after inspection. All repaired areas were visually inspected and the entire weld area, both vendor weld and repair weld, were magnetic particle examined.

Arc strikes and gouged areas in the weld area were blended with base metal by grinding. Any grinding in excess of 1/16-inch in depth was repaired by welding. All repaired areas were then visually and magnetic particle examined.

The above corrective action is limited to vertical stiffeners in accessible areas. Weld areas that would require removal of other internal stiffener plates for access to the vertical weld was dispositioned by GE to use as is. This is true also for welds on horizontal stiffener plates and portions of vertical welds which occur behind horizontal plates at the intersection of the vertical and horizontal stiffeners.

Areas in which slugged welds were detected were removed. Insert plates of A441 and SA 516 Grade 70 steel were cut to fit and welded in place by using approved welding procedures. All areas of repair for slugged welds were visual and magnetic particle inspected. All full penetration butt welds were also radiographed.

IEW repaired the unit B1 structure to meet applicable requirements. All repairs were acceptable and the structure was released for shipment to the site.

TVA's Quality Engineering Branch has implemented more rigorous and more frequent surveillance and inspections of the remaining structures being fabricated by IEW for other TVA nuclear plants in order to avoid further noncompliance.

All corrective action for the unit A1 structure has been completed. The unit A2 structure will be corrected by June 16, 1981.