

HARTSVILLE AND PHIPPS BEND NUCLEAR PLANTS - ALL UNITS
FAULTY WELDING BY LAKESIDE BRIDGE AND STEEL ON
DRYWELL VENT STRUCTURE AND REACTOR PRESSURE VESSEL PEDESTAL

10CFR50.55(e) REPORT NUMBER 1 (INTERIM)

NCR'S HNP-A-038, HNP-A-050, HNP-B-024, AND PBN-028

On June 6, 1979, TVA notified NRC-OIE Region II Inspector, W. B. Swan, of a potentially reportable 10CFR50.55(e) condition that has 10CFR Part 21 implications regarding a breakdown in the quality control program at Lakeside Bridge and Steel (Lakeside). The breakdown involves the shipment of the drywell vent structure and the reactor pressure vessel (RPV) pedestal by Lakeside with buttered edges that have been found by TVA forces to contain enough porosity, lack of fusion, and slag inclusion to be deemed unacceptable per the American Welding Society (AWS), code D1.1. This is an interim report on the subject NCR's.

Description of Deficiency

Drywell Vent Structure

As a result of the buttering problem identified on the reactor pressure vessel shield wall (NCR's HNP-A-037 and HNP-A-043), fabricated by Industrial Engineering Works (IEW), the TVA construction forces suspected that the edges of the drywell vent structure fabricated by Lakeside had also been buttered. The results of a spot check of some of the weld prep edges by radiography revealed that buttering had been performed, and that the buttering contained sufficient defects to be unacceptable by AWS standards. Subsequently, NCR HNP-A-038 was written to document this nonconforming condition.

None of the drywell vent structures for the Phipps Bend Nuclear Plant (PBN) have been shipped from Lakeside; therefore, no NCR will be written for PBN at this time.

Reactor Pressure Vessel Pedestal

During field erection of the reactor pressure vessel (RPV) pedestal fabricated by Lakeside, a routine weld inspection revealed cracks in an area outside of the zone of the TVA weld. These cracks have a horizontal orientation and appear to be from 1/8-inch to 3/8-inch below the circumferential weld which joins the ring girder to the shell section. Further visual inspection revealed that similar cracks are apparent at several other locations on the RPV pedestal. The results of preliminary liquid penetrant examination and acid etching indicate that the cracks are developing along a line where the vendor apparently fused weld metal to the top edge of the parent metal, (i.e., buttered the weld joint) to meet dimensional requirements and/or edge geometry. Some of this buttering radiography tested by TVA contains sufficient amounts of porosity, lack of fusion, and slag inclusion to be deemed unacceptable under AWS code D1.1.

All segments of the RPV pedestal for PBN unit 1 are onsite. Only a portion of the RPV pedestal for PBN unit 2 is onsite. NCR PBN-028 has been written to cover the nonconforming condition documented in NCR HNP-A-050. In addition, NCR HNP-B-024 has been written to cover the nonconforming condition documented in NCR HNP-A-050 for both units at HNP Plant B.

Cause of the Deficiency

The cause of the buttering deficiencies can be attributed to a disagreement between Lakeside and the technical engineer (GE) over whether the procurement specification classifies buttering as a repair or not, and what NDE is required when buttering is performed. Both organizations agree that the buttering that was performed contains sufficient defects to be considered unacceptable per AWS code D1.1.

The cause of the cracking in the RPV pedestal is still under investigation by TVA and Lakeside. The results of these investigations will be contained in our final report to you on these NCR's.

Safety Implications

Had the defects in the buttering performed by Lakeside, or the crack in the HTN A1 RPV pedestal gone undetected, the structural integrity of the RPV pedestal, and drywell vent structure could be jeopardized under dynamic loading during an earthquake or LOCA. Failure of either structure during such an event has the potential to endanger the health and safety of the public.

Corrective Action

A. Repairs Made by Buttering

- For all RPV pedestal and drywell vent structure segments shipped by Lakeside before June 1, 1979, TVA will perform the following in accordance with procedures that have been approved by the technical engineer (GE) during the field erection of the structures.
 1. Locate all buttered edges by visual inspection, acid etching, radiography (partial or 100 percent), or using the Lakeside assembly records.
 2. Perform one hundred percent RT inspection on all buttered edges to locate all defects.
 3. Remove defects per procedure.
 4. Perform MT or PT inspection to assure sound metal where defects are removed.
 5. Repair weld using a procedure approved by the technical engineer.
 6. Perform one hundred percent RT inspection of the areas that are repaired. Steps 1 through 5 will be repeated until an acceptable quality buttering weld is attained.

For all RPV pedestal and drywell vent structure segments not shipped from Lakeside before June 1, 1979, Lakeside will perform 100 percent RT inspection and repair, as necessary all buttered welds before the segments are shipped to TVA.

B. Cracks in the Hartsville Unit A1 RPV Pedestal

Until the cause of the cracking is identified, corrective actions cannot be specified. The corrective actions will be identified in our final report to you on the subject NCR's.

Means Taken to Prevent Recurrence

A. Repairs Made by Buttering

On May 2, 1979, GE sent letter number GLB-61 to Lakeside stating GE's (i.e., the technical engineer's) interpretation of the requirements of the procurement specification with regard to buttering as follows:

1. Weld edge preparation with weld buildup material (buttering) shall require 100 percent radiography.
2. If the supplier plans to use weld filler metal (buttering) in his fabrication process, a procedure should be submitted to the technical engineer for approval.

This action on GE's part should prevent any further misinterpretation by Lakeside of the procurement specification with regard to NDE and approval of buttering procedures.

B. Cracks in the Hartsville Unit A1 RPV Pedestal

Until the cause of the cracking has been determined, actions to prevent recurrence cannot be specified. These actions will be discussed in our final report on the subject NCR's.

Our final report on the subject NCR's will be transmitted to you on or before October 1, 1979.

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