

Enclosure

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2
UNACCEPTABLE WELDING ON BWST
BY STELLAR MANUFACTURING COMPANY
NCR 921

FINAL REPORT

Description of Condition

Stellar Manufacturing Company supplied TVA with components for Borated Water Storage Tanks (BWST) which do not meet acceptance criteria for the nondestructive examinations required by TVA. The defective components include the stainless steel tension rings, vortex suppressors, manways, and liner plate stiffeners for both units.

TVA discovered local areas of lack of fusion and slag deposits in the stainless steel tension rings, vortex suppressors and the manways. These were due to poor welding performed by Stellar during fabrication. The liner plate stiffeners have cracked tack welds caused either by rough handling or poor welding.

Safety Implications

The affected components were to become the structural steel and liner for the BWST. The BWST provides emergency borated water to the plant for maintaining the reactor temperature at safe levels during and after an accident. If this nonconformance had gone uncorrected, implications to safety would occur in two areas. The first would be leakage of borated water from the BWST. The BWST is a Category I, steel lined concrete tank. The liner plates, tension rings, and manways are designed to create a leaktight stainless steel inner liner for the BWST. (The structural steel and liner also provides the secondary function of acting as a form for the pouring of the concrete during BWST construction.) Only the deficient welds in the tension rings and manways would have safety considerations due to leakage. If the deficient welds in these components were severe enough to allow excessive leakage, low borated water levels could possibly occur, thus causing a condition adverse to plant safety. Actually, the welds were not of this severity and would not have permitted these postulated large leakages. Nor were they of a nature such that catastrophic failure of the components could occur. In addition, low-level alarms are available to alert plant personnel of low BWST levels. Thus it is highly unlikely that plant safety could have been adversely affected in this respect.

With regard to the liner plate stiffeners, the welding of the stiffeners are on the exterior of the liner plates next to the concrete. The welding together of the liner plates themselves is performed by another vendor and is not involved in this deficiency. The purpose of the stiffeners is to provide support for the liner plate during

construction and they serve no structural purpose upon completion of the tank. Therefore deficient welds in the stiffeners would not have adversely affected the plant safety.

The second aspect of the deficiency which could affect plant safety is the deficient welding of the BWST vortex suppressors. If deficient welding in these components had gone uncorrected, the suppressors could have failed thereby either negating their ability to suppress vortexing of the BWST emergency flow or blocking the BWST discharge altogether. Either occurrence could interrupt emergency ECCS flow from the BWST such that flow requirements to mitigate the consequences of an accident would not be met. This could adversely affect the operation of the plant.

Corrective Action

TVA has instructed Stellar of the corrective action they are to follow in order to repair the BWST components. The stainless steel tension rings and vortex suppressors have been sent back for refabrication. TVA ground the defective welds and rewelded the manways in unit 1 and will follow the same procedure for the manways in unit 2. Each weld for the liner plate stiffeners for both units is being inspected and all cracked or deficient welds will be ground and rewelded. All corrective actions will be completed by December 15, 1978.

Stellar has two contracts with TVA for the Hartsville and Phipps Bend Nuclear Plants. To prevent this problem from arising within these contracts, TVA has requested that the TVA Inspection and Testing representative at Stellar perform more frequent and more rigid inspections. Also, TVA sent a Quality Assurance audit team to Stellar in January 1978, and the findings resulting from this audit have been corrected. The components for Bellefonte were delivered before this audit was performed.

Stellar components that are at the Hartsville and Phipps Bend sites are being inspected and a full report will be sent to Engineering Design when completed.