TENNESSEE VALLEY AUTHORITY
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March 5, 1986

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WBRD-50-391/86-26

U.S. Nuclear Regulatory Commission
Region II
Attention: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNIT 2 - BOX ANCHOR REAR PLATES FUSED TO PIPE BY WELDING - WBRD-50-391/86-26 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Bob Carroll on February 3, 1982 in accordance with 10 CFR 50.55(e) as NCR WBN 6264. This NCR identified the deficiency for both units at Watts Bar. However, subsequent review showed that there was no adverse impact on safety for unit 1, so this item is being reported for unit 2 only. Enclosed is our final report.

If there are any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R Gridley

R. L. Gridley
Manager of Licensing

Enclosure
cc: Mr. James Taylor, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 2
BOX ANCHOR REAR PLATES FUSED TO PIPE BY WELDING
WBRD-50-391/86-26
NCR 6264
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

To accomplish welding of rear plates on box anchors having metal dissimilar to the supported piping (carbon steel rear plate to stainless steel piping or vice versa) TVA drawings 47B100-2 and 47B100-3 specify welds for the rear plate seam to stop short of the pipe by 3/8 inch to 1/2 inch for a carbon steel plate to a stainless steel pipe or by 3/4 inch to 1 inch for a stainless steel plate to a carbon steel pipe. These drawings do not have any specific holdback instructions for plates and piping of the same material. However, TVA has identified instances of welds on rear plates where the plate and piping are both stainless steel or carbon steel and the welds were held back up to 1/2 inch from the pipe. Also individual support drawings call for full length welds along the mid seam of the rear plate and the plate is to have a snug fit around the piping. This has led to instances where full length welds were attempted and the weld subsequently fused to the piping.

The cause of the hold back of the rear plate weld when similar metals were involved was a misapplication of the notes on drawings 47B100-2 and -3 which allowed a weld holdback as discussed above when dissimilar metals are used for the rear plate and piping. The fusion of welds to piping was caused by a combination of factors including the fact that the drawings call for a full length weld along the plate seam and a snug fit between the plate and the piping but do not give specific instructions on any holdback allowed and how to prevent fusing with such close distances involved.

Safety Implications

TVA has determined that for the instances where a 1/2 inch holdback on the rear plate weld occurred (with the plate and piping being similar metals) the present installations are acceptable and may be used as is. Consequently, there are no safety implications associated with these installations. With regard to the fusion of safety-related piping to the rear plate of the pipe's anchor, such fusion could restrain thermal expansion or contraction of the piping. Depending on the amount of restraint this condition could cause damage to the piping. Such damage could cause a loss of the piping's pressure boundary and subsequent loss of safety-related components serviced by the piping. This in turn could adversely affect plant safety.

Corrective Action

TVA has completed a review of drawings and a field walkdown inspection of the rear plate on box anchor type supports installed in Units 1 and 2. The results of the subsequent Office of Engineering (OE) evaluation are documented in OE Calculation CEB-CAS-173. The results of this review have documented the acceptability of all installed Unit 1 supports and the acceptability of all but two supports installed in Unit 2. These two supports, 2-70-219 and 2-70-359, as well as a third Unit 2 support, 47A060-67-81 will be reworked by Unit 2 Fuel load. (This third support was not included in the OE evaluation as it was scheduled to be reworked for other reasons and any existing fusion was considered moot).

To prevent a recurrence of this problem, drawings 47B100-2 and 47B100-3 were revised under engineering change notice (ECN) 5901 to require all welds on rear plates of box anchors to be stopped short of the pipe boundary. Also, other drawings in the 47B100 drawing series will be revised by May 21, 1986 per ECN 6165 in order to provide clarification of the holdback dimension.