

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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NOV 09 1987

WBRD-50-390/84-17  
WBRD-50-391/84-17

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission  
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Gentlemen:

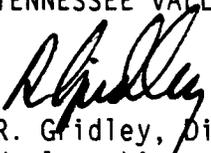
WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - DEFICIENT WELDS FOR HANGER LUGS ON ASME CODE PIPING - WBRD-50-390/84-17 AND WBRD-50-391/84-17 - SECOND INTERIM REPORT

The subject deficiency was initially reported to NRC Region II Inspector Steve Elrod on January 27, 1987, in accordance with 10 CFR 50.55(e) as SCR W-518-P-S for unit 1. SCR WBN 7192-S was initiated to document the potential for this deficiency for unit 2. A similar deficiency was reported previously (WBRD-50-390/84-17 and WBRD-50-391/84-17), but was downgraded to nonreportable in our May 18, 1984 report to NRC. Because of the similarity to the previous deficiency, we reopened this item on January 27, 1987, rather than reporting this as a new construction deficiency. Our first interim report was submitted on February 27, 1987. Enclosed is our second interim report. We expect to submit our final report on or about December 1, 1988.

If there are any questions, please telephone R. D. Schulz at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
R. Gridley, Director  
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Enclosure  
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## ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2  
DEFICIENT WELDS FOR HANGER LUGS ON ASME CODE PIPING  
SCR W-518-PS, NCR WBN 7192, AND NCR WBN 5559  
WBRD-50-390/84-17 AND WBRD-50-391/84-17  
10 CFR 50.55(e)

### SECOND INTERIM REPORT

#### DESCRIPTION OF CONDITION

During rework activities on unit 1 supports on the Essential Raw Cooling Water (ERCW) system, it was discovered that welds joining the piping shear lugs to the pipe did not achieve complete penetration in conformance with the design drawings that specify full penetration welds. In addition, the welds on some of the shear lugs did not extend the entire length of the lug. Discrepancies were also found with the specified root gap on a small number of the known discrepant welds. On unit 1, weld deviation reports have been written that identify other full penetration shear lug welds in various other systems that have a lack of the specified full penetration. This nonconformance was reported under SCR W-518-P for unit 1. NCR WBN 7192 was written for unit 2 to facilitate evaluation for generic nonconformances.

In March 1984, NCR WBN 5559 was initiated to address a generic problem of a lack of full penetration on shear lug welds due to the welds not being backgouged after the initial weld pass. The May 18, 1984 final report dispositioned the nonconformance as use-as-is. TVA has since discovered the use-as-is disposition was not adequately justified.

The most likely cause of the lack of full penetration in the welds is the same as that identified in NCR WBN 5559, i.e., the welder did not backgouge before welding the second side of the lug as required by General Construction Specification G-29M, drawing I.M.1.2-12, although improper fitup between the lug and pipe could have also contributed to the condition. The lack of weld along the entire lug length and the lack of the specified gap apparently resulted from poor craftsmanship and inadequate inspections.

This deficiency was discovered and reported by a welder who was performing unrelated rework activities for the purpose of resolving zero period acceleration (ZPA) concerns. His action was indicative of his alertness and commitment to quality.

#### SAFETY IMPLICATIONS

The lack of a full penetration weld results in an increased stress in the weld and the pipe wall. Experience shows that the stress ratio (applied stress/allowable stress) will normally be more critical in the pipe wall. The increased stress could, in some instances, result in some shear lugs inducing stress in the pipe wall that would exceed the allowable stress. The overstressed condition in the pipe wall could potentially result in some local yielding at that point. A complete analysis has not been performed on all

discrepant welds to determine the likelihood of a failure under all design loading conditions.

#### INTERIM PROGRESS

In TVA's interim report for this deficiency dated February 27, 1987, it was reported that 100 percent of the shear lug welds on safety-related systems would be examined ultrasonically. TVA has since concluded that only shear lugs welded to ASME Section III Class 1 pipe will be ultrasonically tested to verify full penetration. Since the ASME Code does not require or define specific volumetric examination requirements for these attachment welds, a suitable ultrasonic examination procedure is being qualified with the aid of radiographic and metallographic data. If the examinations show the lug welds to be inadequate, appropriate modifications will be made.

All lugs on ASME Section III Class 2 and Class 3 code piping where full penetration welds were specified on the design drawings will not be ultrasonically examined; however, they shall be reanalyzed using ASME Code Case N-318 to determine the required size for fillet welds. Additionally, although the ASME Code Case is not applicable to B31.1 code piping, its logic will be used in the same manner on all lugs attached with full penetration welds to this class piping that is located in Category I structure. The welds will require reinspection to determine if the existing weld fillets are of sufficient size to meet the design requirements. If the existing fillet size is not adequate, modifications will be made as required. For cases where calculations show that a fillet weld would not be sufficient for the design conditions, new lugs will be installed or other modifications made as circumstances dictate. The WBN FSAR will be revised to allow the use of ASME Code Case N-38 as endorsed by NRC Regulatory Guide 1.84.

All work described above will be completed before fuel loading of unit 1.

The corrective action to be used on unit 2 will be the same as outlined above and will be completed before fuel loading of unit 2.

A final report will be submitted to NRC on or about December 1, 1988.