

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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January 23, 1986

WBRD-50-390/84-19

WBRD-50-391/84-19

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:

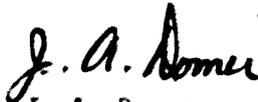
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - OVERSTRESSED PAD PLATES FOR HYDROGEN (H₂) PIPE SUPPORTS - WBRD-50-390/84-19, WBRD-50-391/84-19 - FINAL REPORT FOR UNIT 2

The subject deficiency was initially reported to NRC-OIE Inspector Bob Carroll on April 5, 1984 in accordance with 10 CFR 50.55(e) as NCR WBN CEB 8406. Our final report for unit 1 and first interim report for unit 2 was submitted on May 4, 1984. Our second interim report for unit 2 was submitted on June 12, 1985. 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



J. A. Domer
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
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Atlanta, Georgia 30339

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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNIT 2
OVERSTRESSED PAD PLATES FOR HYDROGEN (H₂) PIPE SUPPORTS
WBRD-50-391/84-19
NCR WBN CEB 8406
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

During an analysis of revised loads on pad plates used with H₂ collection system supports, TVA designers discovered that the original analysis failed to include a transverse load component on the pad plates to which unit 2 supports (47A915-9-35 and 47A915-9-47) were attached. These pads are welded to the steel containment and an H₂ piping support is then welded to the pad. Because the welds used to join the pad plates to the steel containment are ASME Code welds, the stresses in the pads were to be limited to 1.5 S_m (design stress intensity). However, when the transverse loads are considered, the stresses in these pad plates exceed the 1.5 S_m ASME allowable.

Each unit has two of these hydrogen lines, and each line has 13 supports. Of these 13 supports, only one has a transverse load, and in performing similar calculations for the 26 supports, the preparer failed to recognize that 2 plates had a transverse load component not found on the other 24 pad plates. This omission then went undetected when the calculations were checked by the reviewer.

Safety Implications

The hydrogen lines in question run from the top of the containment dome to the suction return fans and are used to prevent H₂ from collecting in serious quantities. Because pad plates for a support in each of the H₂ lines are considered overstressed, a seismic event could cause the pads and attached supports to fail causing a subsequent loss of the redundant H₂ lines. Under design basis accident conditions, the loss of the H₂ recirculation lines could degrade the overall performance of the hydrogen collection system, thereby adversely affecting safe operation of the plant.

Corrective Action

TVA has analyzed the pad plates for the unit 2 supports (47A915-9-35 and 47) and has determined the stiffening required to resolve the overstressed condition. Changes to incorporate this stiffening have been completed by both design and construction personnel through engineering change notice (ECN) 5256. To prevent a recurrence of this problem, the piping analysis section involved has been trained in Office of Engineering Procedure (OEP) 7, "Calculations," and OEP 10, "Review," and greater emphasis has been placed on review of analysis methods and on checking mathematics. As the conditions surrounding this deficiency are unique to the WBN H₂ collection supports, TVA feels this is sufficient action to prevent recurrence of the problem.