TENNESSEE VALLEY AUTHORITY
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JUN 27 1986

WBRD-50-390/86-28
WBRD-50-391/86-24

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 - INADEQUATE FLEXIBILITY OF 3/8-INCH TUBING ATTACHED TO THE STEEL CONTAINMENT VESSEL - WBRD-50-390/86-28, WBRL-50-391/86-24 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Bob Carroll on January 29, 1986 in accordance with 10 CFR 50.55(e) as SCR WBN CEB 8576. Our interim report was submitted on February 27, 1986. Enclosed is our final report.

Delay in submittal of this report was discussed with Bob Carroll on June 13, 1986.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. L. Gridley, Director
Nuclear Safety and Licensing

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

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

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
INADEQUATE FLEXIBILITY OF 3/8-INCH TUBING ATTACHED
TO THE STEEL CONTAINMENT VESSEL
WBRD-50-390/86-28, WBRD-50-391/86-24
SCR WBN CEB 8576
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

For 3/8-inch tubing attached to and routed through the steel containment vessel (SCV), design instructions issued in 1979 require that the first tubing support beyond the SCV penetration (inside and outside of the vessel) be located 30 to 40 inches from the penetration. This was to ensure at least 30 inches of tubing would be available to absorb SCV movements. However, as a result of questions by construction personnel regarding the correct interpretation of detail A14 on drawing 47W625-14, it was determined that design personnel failed to identify that the SCV penetration includes a stub piece of approximately 16 to 18 inches of 18-inch schedule 160 piping to which the 3/8-inch tubing is attached. Because of the rigidity of the piping, the tubing supports should have been located 30 to 40 inches from the end of the pipe stub, but the piping length was not considered when locating the first tubing support resulting in installations which could have as little as 12 inches of tubing between the penetration and the support. Such installations are much less flexible than intended. This error was caused by ambiguities in the design instructions issued in a 1979 memorandum from TVA's Chief of Civil Engineering Branch. These ambiguities were carried over to design drawings due to a lack of proper coordination between the design disciplines involved.

Safety Implications

This condition of reduced lengths of unrestrained 3/8-inch tubing could result in stresses and loads to the tubing or supports which could exceed the values allowed by Design Criteria WB-DC-40-31.7 or WB-DC-40-31.9, and could cause the loss of the tubing's pressure boundary. This loss in itself could not adversely affect plant safety as the only tubing identified as being affected is non-safety-related tubing used in the sampling and water quality system. However, a rupture outside the SCV of tubing connected to the reactor coolant system and a simultaneous loss of the tubing's inboard containment isolation valve could result in a breach of the containment boundary. As such this condition could adversely affect the safe operations of the plant.

Corrective Action

TVA has completed its evaluation of the existing installations and has determined that some of the installations are acceptable as-is, some require the removal of supports and some will require relocating supports. Required design changes and subsequent field modifications are being performed through engineering change notice (ECN) 6047 and will be completed prior to initial fuel loading of each unit. Also, as part of TVA's design changes, drawing details which were misinterpreted are being deleted from the original drawings and the new typical drawings refer to the pipe stub as the point of reference for determining tube support location.

TVA has developed procedures which should prevent a recurrence of this condition by requiring the use of interface reviews. The interface review process required by Office of Engineering Procedures (OEP) OEP-8, "Design Output," and described in OEP-10, "Review," requires a high level of interface and close communication between disciplines. Also, TVA has increased emphasis in training design personnel on procedures and all design personnel have been trained in these OEPs.