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WBRD-50-390/91-39
WBRD-50-391/91-39

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of) Docket Nos. 50-390
Tennessee Valley Authority) 50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - FAILURE TO POSTULATE BREAKS IN STEAM GENERATOR WET LAYUP PIPING - WBRD-50-390/91-39 AND WBRD-50-391/91-39 - FINAL REPORT

The subject deficiency was initially reported to NRC Region II on October 21, 1991, in accordance with 10 CFR 50.55(e) as Significant Corrective Action Report (SCAR) WBP900420PSCA. An interim report was submitted to NRC on November 21, 1991. Enclosure 1 contains TVA's final report on this subject.

The commitment made in this report is contained in Enclosure 2.

If there are any questions, please telephone P. L. Pace at (615) 365-1824.

Sincerely,

John H Garrity

John H. Garrity

Enclosures
cc: See page 2

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN)
FAILURE TO POSTULATE BREAKS IN STEAM GENERATOR WET LAYUP PIPING
SIGNIFICANT CORRECTIVE ACTION REPORT (SCAR) WBP900420PSCA
WBRD-50-390/91-39 AND WBRD-50-391/91-39
FINAL REPORT

DESCRIPTION OF DEFICIENCY

TVA has determined that a portion of the Steam Generator Wet Layup (SGWL) System piping which is connected to the Main Feedwater (MFW) System within the Auxiliary Building has not been analyzed for the environmental or dynamic effects of a pipe break. Specifically, four SGWL piping lines (TVA Class H) connect to MFW bypass piping in the yard area (elevation 729.0) and extend approximately 20 feet into the Auxiliary Building penetration rooms of each unit (elevation 713.0). These lines are blocked with double isolation valves inside the Auxiliary Building during all modes of normal operation. During cold shutdown and refueling, the SGWL System is used for corrosion control of steam generator internals.

General Design Criterion 4, "Environmental and Dynamic Effects Design Bases," of Appendix A to 10 CFR 50, requires that structures, systems, and components important to safety be protected from the environmental and dynamic effects of pipe rupture. WBN Design Criteria WB-DC-40-31.50, "Evaluating the Postulated Effects of a Pipe Failure Inside and Outside Containment," requires analysis of postulated pipe failures in "high energy" (temperature exceeding 200 degrees Fahrenheit (F) and pressure exceeding 275 psig) nonsafety class piping (i.e., non-ASME Class 1, 2, or 3). The subject SGWL recirculation piping in the Auxiliary Building penetration rooms contains feedwater fluid from the penetration wall up to the isolation valves. The normal mode operating conditions for the feedwater bypass lines at the SGWL branch connection are 447.5 degrees F at a pressure of 1185 psig. Therefore, these sections of SGWL System piping should have been analyzed for the environmental and dynamic effects of a pipe break.

The root cause for the subject deficiency is lack of an adequate interdisciplinary review. The SGWL recirculation system was designed via TVA's Engineering Change Notice (ECN) process. Revision 0 of ECN 3375 (Unit 1) was issued December 2, 1982, and the final revision was closed June 18, 1984. The Unit 2 ECN was closed May 16, 1986. Review of the ECN cover sheets indicates that the "squad check" for interdiscipline review excluded the nuclear engineering support branch for high energy line break (HELB) environmental review and apparently excluded pipe rupture analysis review. Management for each branch representing these sections signed forms certifying that such reviews were not required.

TVA's Hanger Analysis and Update Program (HAAUP) methodology would have detected this deficiency. Under the HAAUP program, TVA has undertaken a detailed pipe rupture evaluation. The purpose of this effort is to ensure that pipe rupture evaluations are adequate. This task will evaluate changes made since the last evaluations were performed and

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DESCRIPTION OF DEFICIENCY (continued)

verify the adequacy of previous evaluations. Engineering Administrative Instruction (EAI)-8.08, "Documentation and Analysis Procedure for Evaluating the Effects of Postulated Pipe Ruptures," and EAI-8.09, "Field Evaluation of the Effects of Postulated Pipe Ruptures," provide for "an evaluation of the effects of postulated pipe ruptures as specified in Pipe Rupture Design Criteria WB-DC-40-31.50." These procedures also address energy classification, high/moderate energy boundaries, identify break locations, and target evaluations. Through this review, the subject deficiency and other potential examples which could exist would have been identified.

SAFETY IMPLICATIONS

The Auxiliary Building has not been analyzed for the environmental conditions and the effects of pipe whip and jet impingement associated with the postulated failure of the subject piping. Required safety-related equipment could potentially be exposed to an environment for which it is not qualified and jeopardize the ability of such equipment to perform its safety function. For breaks outside the Auxiliary Building, pipe rupture of SGWL piping is bounded by previously analyzed breaks of main steam and main feedwater piping in the yard. The subject deficiency could have adversely affected the safe operation of the plant had it remained uncorrected.

CORRECTIVE ACTIONS

1. TVA plans to modify the design of the subject piping to allow manual isolation of these lines in the yard area prior to where the piping enters the Auxiliary Building. This modification will eliminate this HELB potential within the Auxiliary Building and is scheduled to be completed prior to System 41 (Layup Water Treatment) testing for Units 1 and 2, respectively.

2. The interdiscipline review process is addressed in Nuclear Engineering Procedure (NEP) 5.2, "Review." This procedure provides instructions for interface review both internal and external to site engineering. Also, an interdiscipline coordination matrix, distributed to all WBN engineering employees, provides additional guidance in determining coordination requirements. Both "impact to pipe rupture analysis" and "environmental activities" are included on this matrix as items for interface consideration during the design process. Recently, increased emphasis has been placed on the importance of the interface review process at WBN by management through memorandums.

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CORRECTIVE ACTIONS (continued)

WBN design control processes are currently in place which should prevent the occurrence of a similar deficiency. EAI-3.05, "Design Change Notices," provides instructions on items which must be considered during the development and review of design changes. Additionally, design and calculation reviews are conducted using checklists contained in WBN desktop instruction, "Administrative Handling of Quality Monitoring Checklists." The checklist assists designers during the design change process and includes consideration for pipe rupture/environmental effects.

ENCLOSURE 2

LIST OF COMMITMENTS

TVA plans to modify the design of the subject piping to allow manual isolation of these lines in the yard area prior to where the piping enters the Auxiliary Building. This modification will eliminate this high energy line break potential within the Auxiliary Building and is scheduled to be completed prior to System 41 (Layup Water Treatment) testing for Units 1 and 2, respectively.