

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

October 7, 1985

WBRD-50-391/85-11

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

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNIT 2 - RESIDUAL HEAT REMOVAL SUMP SUCTION PIPING
OVERSTRESSED - WBRD-50-391/85-11 - FINAL REPORT FOR UNIT 2

The subject deficiency was initially reported to NRC-OIE Inspector
Al Ignatonis on January 29, 1985 in accordance with 10 CFR 50.55(e) as NCR WBM
MEB 8503. Related conditions were later documented on NCR 5962 for unit 1 and
on NCR 5969 for unit 2. We reported on all NCRs simultaneously. Our final for
unit 1 and first interim report for unit 2 were submitted on March 18, 1985.
Our second interim report for unit 2 was submitted on June 14, 1985. Enclosed
is our final report for unit 2.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Homer
J. W. Hufham, Manager
Licensing and Risk Protection

Enclosure

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

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Institute of Nuclear Power Operations
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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNIT 2
RESIDUAL HEAT REMOVAL SUMP SUCTION PIPING IS OVERSTRESSED
WBRD-50-391/85-11
NCRs WBN MEB 8503 AND 5969
10 CFR 50.55(e)
FINAL REPORT FOR UNIT 2

Description of Deficiency

An overstressed condition has been identified on the residual heat removal (RHR) system (system 74) with the lugs on the supply line from the reactor building emergency sump to the RHR pumps. The lugs are detailed on mechanical piping drawing 47W832-2 and were installed in order to center the line in the guard pipe. The lugs were modeled into the piping analysis as support locations. Support loads were not generated and evaluated for induced stress on the piping system. An evaluation of the induced stress caused by the lugs at supports inside the guard pipe on unit 2 rigorous analysis problem N3-63-88A indicates that the lugs are overstressed. This condition was documented in TVA's Office of Engineering (OE) nonconformance report (NCR) WBN MEB 8503.

Subsequent investigation revealed that the orientation, location, and quantity of the support lugs that were installed does not agree with design drawings. This condition was documented in TVA's Office of Construction (OC) NCR 5969.

The OE-identified nonconforming condition was the result of the original designer of the lugs not taking into consideration all of the loads that would be imposed on the lugs. The lugs were designed to center the line in the guard piping without consideration for the thermal and seismic loads that would be imposed on them. The cause for the incorrect lug installation is indeterminate due to the time lapse since the original installation.

Safety Implications

The RHR system is part of the emergency core cooling system (ECCS) utilized to mitigate a loss of coolant accident (LOCA). In this mode, the RHR system draws coolant inventory from the containment sump after the refueling water storage tank (RWST) inventory is depleted. If the overstressed RHR sump suction piping were to fail when required for recirculation in the ECCS mode, the safe operation of the plant could be adversely affected.

Corrective Action

TVA has determined the loading on the unit 2 lugs, designed or revised supports as needed, and made all the necessary revisions to affected drawings under engineering change notices (ECNs) 5461 and 5558. The construction work required will be completed by November 30, 1985.

The OE-identified condition is a unique situation which occurred on the original issue of the TVA piping and analysis drawing. A review of other safety-related piping systems on Watts Bar Nuclear Plant (WBN) has been accomplished, and no other problems of this nature were identified. A review for a generic condition found that Sequoyah Nuclear Plant (SQN) does not have this design on a similar system, and Bellefonte Nuclear Plant (BLN) has properly designed supports on this system. No further action is required.

Research of weld documentation shows that the lugs were installed in February 1975 during the early stages of construction of WBN. Changes made in the quality assurance program since 1975 will prevent any recurrence of this type of nonconformance. Specifically, quality control procedure (QCP) 4.23-8, "Support Field Inspection," states under acceptance criteria sections 7.5 and 7.6 that integral attachments to the pipe are to be inspected in accordance with OE-approved drawings.

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