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OCT 25 1991

WBRD-50-390/83-46
WBRD-50-391/83-45

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)
Tennessee Valley Authority)

Docket Nos. 50-390
50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - ROUTING OF RADIOACTIVE AND
NONRADIOACTIVE SYSTEM INSTRUMENT LINES - NONCONFORMING CONDITION REPORT
(NCR) W-130-P - WBRD 50-390/83-46 AND WBRD 50-391/83-45 - REVISED FINAL
REPORT

The subject deficiency was originally reported to NRC-OIE Inspector
Linda Watson on July 29, 1983, in accordance with 10 CFR 50.55(e). A
revised final report was submitted on April 19, 1985, and a supplemental
final report for Unit 2 was submitted on April 7, 1986. Contrary to
corrective action completion statements reported in these submittals,
some additional work remains in order to resolve this deficiency. This
remaining work was discovered during preparation of a closure package for
NRC review.

This report revises the work completion status for reconnecting Systems
72 and 78 instrument panel drains and high-point vent lines to the closed
drain system. In addition, this submittal revises the work completion
status for tagging instrument valves on systems with instrument panel
drains and high-point vent lines connected to the closed drain system,
with uniquely numbered identifiers.

Enclosure 1 provides TVA's revised final report for this deficiency.
Enclosure 2 provides the additional commitments listed in this report.

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U. S. Nuclear Regulatory Commission

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

Sincerely,



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Enclosures

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN)
ROUTING OF RADIOACTIVE AND NONRADIOACTIVE SYSTEM INSTRUMENT LINES
NCR W-130-P
WBRD-50-390/83-46, WBRD-50-391/83-45
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REVISED FINAL REPORT

Description of Deficiency

The instrument panel drawings (47W600 series drawings) required instruments located on a local panel, regardless of the system, to have their drains and high-point vent lines connected to the closed drain system. This presented the potential for radioactive material to enter non-radioactive systems. In addition, this design allowed nitrogen from the cold leg accumulator No. 4 pressure transmitter high-point vent to enter the component cooling system through the high-point vent for loop 4 reactor coolant pump's (RCP) motor oil cooler flow transmitter as a result of a specific instrument valve alignment problem. Enough nitrogen entered the system to cause the component cooling system pumps to cavitate. This condition represents a potential common mode failure for this system.

TVA did not consider that two (or more) normally-closed instrument drain/high-point vent valves could be in the open position, simultaneously during operation, when designing the routing of the instrument drain and high-point vent lines to the closed drain system. All instruments installed on a panel were typically routed to the closed drain system for ease and simplification of installation.

Safety Implications

Uncontrolled system crossties, if uncorrected, could allow the introduction of radioactive fluid into systems that are not designed to handle such materials. This could result in the possible release of radioactive materials to the environment. In addition, the possibility of safety-related pump degradation due to cavitation induced by the injection of gas into liquid filled systems, if uncorrected, could have adversely affected the safe operation of the plant.

Corrective Action

Instrument drain lines which were originally connected to the closed drain system, but were not associated with a radiation hazard, were disconnected from the closed drain system in accordance with Engineering Change Notice (ECN) 4287. Subsequently, ECNs 5553 (Unit 1) and 5554 (Unit 2) were issued to reconnect the vent/drain lines to the closed drain system for the Containment Spray System (No. 72) and the Spent Fuel Pit Cooling System (No. 78). Field implementation of ECN 5553 was completed under Workplan 5122, with the exception of the high-point vent valves for flow indicators 0-FI-78-39 and -40 located on panel 2-L-24. This exception is contrary to the Unit 1 work completion statement specified in our revised final report submitted on April 19, 1985, and has been identified by Problem Evaluation Report (PER) WBPUR 910051. An investigation into this exception determined that the

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Corrective Action (Continued)

responsible workplan engineer apparently failed to perform a field verification of the high-point vent lines installation. Currently, the new work control process requires a minimum of three independent verifications of field work completion. These high-point vent valves will be connected to the closed drain system by the Unit 1 system completion milestone date for System 78. All System 78 instrument panel drains and high-point vent lines are required for Unit 1 operation.

TVA reported to NRC in Supplemental Final Report for Unit 2 dated April 7, 1986, that the construction work to reconnect Systems 72 and 78 panel drains and high-point vent lines to the closed drain system for Unit 2 was complete. However, a field walkdown of Unit 2 System 72 instrument panels, documented in PER WBPEN 910051, revealed that two high-point vent lines were not connected to the closed drain system. Therefore, TVA will ensure that System 72 panel drains and high-point vent lines on Unit 2 are connected to the closed drain system. This action will be completed by Unit 2 fuel load.

In an effort to minimize improper instrument valve alignments and system crossties, Design Change Request (DCR) 536 was initiated to uniquely identify and tag each instrument valve in safety-related systems, including the systems with instrument panel drains and high-point vent lines connected to the closed drain system. This instrument valve tagging effort has not been fully implemented as determined by a field walkdown of Systems 72 and 78 instrument valves described in PER WBPEN 910051. Therefore, TVA will ensure that instrument valves on systems with panel drains and high-point vent lines connected to the closed drain system are tagged with unique identification tags. This action will be completed by the corresponding Unit 1 system completion milestone date for each applicable system required for Unit 1 operation. Applicable Unit 2 systems will be tagged by Unit 2 fuel load.

To prevent recurrence, TVA drawing 47W600-0-4 (Note 6) was issued to identify systems that present a radiation hazard and thus must have their high-point vent and panel drain lines routed to the closed drain system. This requirement was later included in Project Engineering Specification N3E-934 paragraph 3.2.13. In addition, instrumentation connected to the closed drain system will be controlled by plant instructions to verify that no unacceptable crosstie exists before or during system operation. Instrument Maintenance Instruction (IMI) - 150, "Essential Instrumentation Operability Verification," was issued to assure that pertinent valves are verified to be properly oriented prior to operation. IMI-150 will be performed just prior to startup from each refueling outage.

ENCLOSURE 2

LIST OF COMMITMENTS

1. Connect high-point vent valves for flow indicators 0-FI-78-39 and -40 to the closed drain system. This action will be completed by the Unit 1 system completion milestone date for System 78.
2. Ensure that System 72 instrument panel drains and high-point vent lines on Unit 2 are connected to the closed drain system. This action will be completed by Unit 2 fuel load.
3. Ensure that instrument valves on systems with instrument panel drains and high-point vent lines connected to the closed drain system are tagged with unique identification tags. This action will be completed by the corresponding Unit 1 system completion milestone date for each applicable system required for Unit 1 operation. Applicable Unit 2 systems will be tagged by Unit 2 fuel load.
4. Issue Instrument Maintenance Instruction (IMI)-150, "Essential Instrumentation Operability Verification," to assure that pertinent valves are verified to be properly oriented prior to operation.