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OCT 30 1987

WBRD-50-390/85-50
WBRD-50-391/85-49

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 - INADEQUATE SLOPE ON INSTRUMENT SENSE LINES - WBRD-50-390/85-50, WBRD-50-391/85-49 - REVISED FINAL REPORT

The subject deficiency was initially reported to NRC-Region II Inspector Al Ignatonis on October 8, 1985, in accordance with 10 CFR 50.55(e) as NCR WBN 6172 R1. NCR WBN 6359 was initiated later on the same subject for unit 2 and is reported with WBN 6172 R1. Our interim and final reports were submitted on November 10, 1985 and February 10, 1986, respectively. Resident Inspector Glenn Walton was notified of our changed corrective action plans on February 12, 1987. Enclosed is our revised final report.

If there are any questions, please telephone R. D. Schulz at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley, Director
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Regulatory Affairs

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

OCT 30 1987

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
INADEQUATE SLOPE ON INSTRUMENT SENSE LINES
WBRD 50-390/85-50 AND WBRD 50-391/85-49
NCRs 6172 AND 6359
10 CFR 50.55(e)

REVISED FINAL REPORT

DESCRIPTION OF DEFICIENCY

A number of instrument sense lines have been found that do not conform to the minimum slope requirements as specified in TVA drawing 47W600-0-4 notes. TVA considers this a generic deficiency in that this condition may exist in the majority of the sense lines at the plant and has determined that the major contributing factors causing this problem were unclear design requirements and poor installation requirements and techniques.

SAFETY IMPLICATIONS

Inadequate sense line slope could result in the degradation over the plant's lifetime of the associated safety-related instruments due to the effects of air entrapment which could accumulate and adversely affect the accuracy or time response of the instrument. As determination and justification of safety-related instrument set points do not include errors due to air entrapment in sense lines, there is a potential that over time air accumulation could cause a failure of various safety-related instruments to perform their required safety or control functions within analyzed limits. This condition could adversely affect the safety of operations of the plant.

DISCUSSION

TVA issued a stop work order for physical construction, fabrication, and installation of instrumentation work at WBN on January 12, 1987. As part of the TVA action plan to release the stop work order, TVA has issued an Engineering Requirement (ER) Specification ER-WBN-EEB-001, entitled "Instrument and Instrument Line Installation and Inspection." As a result of issuance of these specifications, changes to prior commitments of both a programmatic and a technical nature are necessary. The purpose of this report is to explain these changes.

Our final report described the program established by the Instrumentation Project to provide the corrective actions and the actions to prevent recurrence for instrument sense lines with inadequate slope. This program was described basically on drawings 47W600-0-4, 47W600-0-7, and 47W600-0-8. However, requirements that were previously specified on various drawings are now listed in our ER specification. The 47W600 drawing series has been revised by ECN 6772 to delete or inactivate general notes that provide requirements now controlled by the ER specification.

The ER specification requirements are applicable to work which is not documented as acceptable by inspection and all future work including rework. For clarification, the ER specification requirements will apply to rework on existing instrument lines if the configuration is changed or the pressure retention boundary is violated. The ER specification establishes the engineering and design requirements for instrument sensing line slope, high point vents, low point drains, loop seals, collection chambers, sensing line inside diameter, and other related sensing line air entrapment issues. A requirement of the ER specification is that any deviations from requirements will be approved by the Division of Nuclear Engineering (DNE) before implementation for new work and be specifically listed as a variance to the specification with documented technical justification for the variance.

The specification establishes a minimum slope requirement of 1/4-inch per foot for 1/2-inch diameter pipe and 1-inch per foot for 1/2-inch and smaller diameter tubing and does not require the preparation of configuration control drawings and subsequent DNE evaluation solely for slope control purposes. This slope value and slope configuration control method differs from our prior commitments. However, based on design criteria WB-DC-30-16 and the additional controls and enhancements specified by ER-WBN-EEB-001, this program will provide a clear, more standardized approach that will result in quality installations that are functional and consistent with nuclear safety.

CORRECTIVE ACTION

Unit 1

The disposition for NCR 6172 was revised February 20, 1987 to include a listing of all unit 1 instruments previously labeled as table A (reference drawing 47W600-0-7 R5) and as table B (reference drawing 47W600-0-8 R3). All sensing lines associated with instruments on this list will be reworked, inspected, and documented in accordance with the requirements (including slope) specified in ER-WBN-EEB-001 or will specifically be listed as a variance from ER-WBN-EEB-001 with documented technical justification for the variance. This work will be accomplished before unit 1 fuel load.

Unit 2

The disposition for NCR 6359 was revised Feburary 20, 1987 to include a listing of all unit 2 instruments previously labeled as table A (reference drawing 47W600-0-7 R5) and as table B (reference drawing 47W600-0-8 R3). All sensing lines from instruments on this list will be installed or reworked, inspected, and documented to meet the engineering requirements (including slope) specified in ER-WBN-EEB-001. Any deviation from the requirements of ER-WBN-EEB-001 will be listed as a variance from the specification with documented technical justification for the variance. This work will be accomplished before unit 2 fuel load.

ACTION TO PREVENT RECURRENCE

ER-WBN-EEB-001 establishes the basis for the preparation of installation, inspection, and documentation procedures and instructions by the implementing organizations. The requirements of this specification are applicable to all safety-related and nonsafety-related work performed in seismic and nonseismic buildings, structures, and areas and will minimize sensing line air entrapment and ensure the quality of future installations.

Applicable construction and inspection procedures (CEPs, QCPs, and M&AIs) have been revised to incorporate the ER specification requirements. DNE has reviewed procedures that are associated with sensing line installation, inspection, and documentation to confirm compliance with ER specification requirements. Training to the requirements of the ER specification and revised site procedures will be provided to appropriate personnel before their involvement in engineering, installation, or inspection of instrument sense lines.