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AUG 23 1988

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) - REGION II INSPECTION REPORT NOS. 50-390/88-01 AND 50-391/88-01 - REPLY TO NOTICE OF VIOLATION 390, 391/88-01-02, CABLE TRAY INSTALLATION

Enclosed is our revised response to Kenneth P. Barr's letter dated April 29, 1988, to S. A. White, which transmitted the subject inspection report, citing activities at WBN that appear to be in violation of NRC regulations. Enclosure 1 is our revised response to the notice of violation 390, 391/88-01-02. This revised response more clearly characterizes the reason for the violation in response to Frank R. McCoy's letter dated August 5, 1988, to S. A. White. Enclosure 2 contains a list of commitments made by TVA in this response.

This violation response will be updated after the Corrective Action Program (CAP) plan for cable trays and cable tray support deficiencies has been reviewed by the Watts Bar Program Team and submitted to NRC. The updated response will provide specific details, conveying the program and schedule for implementing the CAP.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

M. Ray for

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Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2
RESPONSE TO VIOLATION 390, 391/88-01-02
REFERENCE: NRC INSPECTION REPORT
NOS. 50-390/88-01 AND 50-391/88-01

Violation 390, 391/88-01-02, "Cable Tray Installation"

10 CFR Part 50, Appendix B, Criterion III, as implemented by TVA's QA Topical Report, Section 17.1.3, "Design Control," requires measures for verifying or checking the adequacy of design, such as by the performance of design reviews, calculations, or suitable testing.

QA Topical Report Table 17D-1, "Quality Assurance Standards for Design and Construction", commits to conforming fully to ANSI N45.2-1971, "Quality Assurance Program Requirements for Nuclear Power Plants".

ANSI N45.2-1971, Paragraph 4.3, requires the following in those cases where the adequacy of a design is to be verified by test:

- The testing is to be identified
- The testing must demonstrate adequacy of performance under the most adverse design conditions.
- If testing indicates that modifications are necessary, the item shall be modified and retested.

10 CFR Part 50, Appendix B, Criterion V, as implemented by the QA Topical Report, Sections 17.1.5 and 17.2.5, "Instruction, Procedures and Drawings", requires that activities affecting quality be accomplished in accordance with instructions, procedures, or drawings.

TVA Design Criteria WB-DC-20-21.1 requires cable tray fittings and supports to be qualified by:

- conformance to NEMA Standard VE1-1971, Section 5.05 or
- requirements specified by the cable tray manufacturer or
- analysis or testing.

TVA drawings 48W970-1 thru -5 and 45W869-Series drawings specify the installation details for cable trays attached to the steel containment vessel.

1. Contrary to the above, cable tray fittings and supports were not properly qualified for the as-built plant. Examples include:

   a. adjustable horizontal connectors (ZNK) have not been qualified.

b. adjustable riser connectors (ZNB) have not been qualified for use in the vertical position. ZNB connectors are installed in the plant in the vertical position.

c. ZNB connectors have been qualified for use in the horizontal position when used within 12 inches of a support. Many ZNB connectors used in the plant are greater than 12 inches from the nearest support.

d. offset fittings have not been qualified.

2. Contrary to the above, the as-installed configuration of cable trays do not match design drawings. An example is that drawing 45W869-2 fails to show the location of all ZNB connectors on Cable raceway 4A1916 in the Reactor Building Annulus.

This is a Severity Level IV violation (Supplement II) and applies to Units 1 and 2

Admission or Denial of the Violation

TVA admits the violation occurred as stated.

Reason for the Violation

PART 1:

While the application of fittings and connectors were not always specified in accordance with design criteria requirements, they typically were specified in applications and configurations similar to qualified configurations. These configurations were designed based on unsubstantiated engineering judgement in lieu of tests and/or analysis. These engineering judgements resulted in designs which do not comply with the design criteria with no documented basis for exceptions.

PART 2:

Appropriate administrative emphasis was not placed on controlling documentation of construction-identified field changes necessary for the installation of the cable trays. This resulted in field changes that were either not documented or were not incorporated into the design drawings.

Quality Control Procedure (QCP)-3.04, revision 0, "Installation, Inspection, and Documentation of Cable Tray Systems," was used for field verification of the as-installed configuration. Cable tray fittings and connectors were not considered as essential attributes and, therefore, were not specifically detailed in the procedure.

Corrective Steps Which Have Been Taken and Results Achieved

Condition Adverse to Quality Reports (CAQRs) WBP 880040 for unit 1 and WBP 880041 for unit 2 have been issued to address the lack of qualification documentation of the cable tray fittings, connectors, and supports. CAQR WBP 880167 has been issued to address the fact that the as-installed

configuration of the cable trays do not match the design drawings. These cable tray and cable tray support deficiencies have been identified as an issue requiring a Corrective Action Program (CAP) and will be reviewed by the Watts Bar Program Team and submitted to NRC.

The corrective action plan for these CAQRs is as follows:

An engineering walk-through will be performed to determine cable tray fittings and support configurations to be evaluated. An acceptance criteria will be determined from new analysis and tests performed for these selected configurations. The acceptance criteria will also take into consideration any vendor information, contractor data, and currently available TVA data. From the engineering walk-through and the established acceptance criteria, bounding configuration will be determined and evaluated to determine the limits of acceptable configurations. The cable tray and cable tray support drawings will then be revised to reflect the acceptable configurations for cable tray fittings (ZNB, ZNK, etc.) in all category I structures including appropriate bolting details. Where required, field modifications will be made. The CAP plan will define the necessary relationship between the limits of acceptable configurations, design drawings, and quality assurance records to be reflected on the drawings and in the documentation.

Engineering evaluation has begun on the cable tray fittings in the Reactor Building annulus region. Preparation of calculations has been initiated to assess qualification of the existing fittings. Preliminary results indicate that the configurations of the ZNK and ZNB fittings used in the annulus are acceptable. The lack of full thread engagement on the ZNB fittings and the orientation of the hinge pins on the ZNK fittings are still being evaluated.

Corrective Steps Taken to Avoid Further Violation

PART 1:

Procedures are in place now that require the documentation of engineering judgement and the basis for which that judgement was made--Nuclear Engineering Procedure (NEP)-3.1, "Calculations." No further recurrence control actions are required.

PART 2:

TVA has implemented a Design Change Improvement Program at WBN in which greater administrative control has been placed on field-identified changes. A design change notice (DCN) will be used for identification, request, evaluation, resolution, and approval of necessary changes or clarifications to engineering documents. Their primary use will be to resolve installation problems encountered during construction or design change implementation. For completion of major modifications, an engineering change notice (ECN) modification package will become the primary means to maintain design control. It is a standalone document which provides design requirements, design bases, installation guidelines, and verification requirements for a plant modification. Drawing change authorizations (DCAs) are prepared as part of the ECN modification package to provide a method of revising issued drawings or detailing design information not on the issued drawing. Drawing

and document revisions necessary to reflect design changes will be issued after the modification is completed, verified, and accepted before the ECN package or DCN is closed. The use of ECNs and DCNs will provide the necessary controls for field-identified changes.

When installation or design change implementation problems occur, the responsible site organization is to initiate a DCN. Construction Engineering Procedure (CEP)-1.13 requires that field work shall not be performed related to the change until the change is formally approved. Work may be performed before formal approval if advance engineering authorization is given and documented on an A-DCN. Unauthorized work is considered to be a condition adverse to quality (CAQ) and will be documented on a CAQR.

For verification of as-installed cable tray configuration, QCP-3.04 will be revised by August 31, 1988, to include verifying correct installation of fittings and connectors.

Date for full Compliance

An updated report will be provided by November 7, 1989, to provide you the details of the corrective actions resulting from implementation of the CAP. Corrective action for the hardware deficiencies identified will be completed before fuel load. Upon issue of revised procedure QCP-3.04, TVA will be in compliance for ongoing activities.

ENCLOSURE 2

LIST OF COMMITMENTS
VIOLATION 390, 391/88-01-02

The following is a list of the commitments made in this response:

- Perform engineering walk-through to determine cable tray fitting and support configuration needing evaluations. This is a portion of the corrective action for CAQR WBP 880040.

- Determine acceptance criteria for cable tray fittings from new analysis and tests performed for these selected configurations. This is a portion of the corrective action for CAQR WBP 880040.

- Determine the limits of acceptable field configurations. This is a portion of the corrective action for CAQR WBP 880040.

- Revise cable tray support drawings if required. This is a portion of the corrective action for CAQR WBP 880041 and CAQR WBP 880040.

- Revise cable tray drawings to reflect the acceptable configurations for fittings for Category I structures, including appropriate bolting details. This is a portion of the corrective action for CAQR WBP 880040.

- Perform any necessary modifications. This is a portion of the corrective action for CAQR WBP 880040.

- Revise Quality Control Procedure (QCP)-3.04 to include cable tray fittings and connections as essential attributes for inspection.

- Nuclear Engineering Procedure (NEP)-3.1, "Calculations," is in place that require the documentation of engineering judgement and the basis for which the judgement was made.

- As part of the Design Change Improvement Program, greater administrative control was placed on field-identified changes.

- Provide updated report to NRC providing the details of the Corrective Action Program (CAP) plan.

- The Corrective Action Program (CAP) plan will define the necessary relationship between the limits of acceptable configurations, design drawings, and quality assurance records to be reflected on the drawings and in the documentation.