

TENNESSEE VALLEY AUTHORITY

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APR 27 1990

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 No. 50-390

WATTS BAR NUCLEAR PLANT (WBN) - NRC INSPECTION REPORT NO 50-390/89-200 - REPLY  
TO NOTICE OF VIOLATION

Enclosed is TVA's response to the subject notice of violation. As discussed in the enclosure, TVA admits that Example 2 of Violation A and the four examples of Violation B involve a noncompliance with regulatory requirements. For Examples 1 and 3 of Violation A, TVA does not consider the cited activities to represent noncompliance with regulatory requirements.


Enclosure 2 lists the commitments made in this submittal.

The delays in submitting this response were discussed with K. P. Barr on April 13, 1990, and M. W. Branch on April 20, 1990.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
E. G. Wallace, Manager  
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Regulatory Affairs

Enclosures  
cc: See page 2

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U.S. Nuclear Regulatory Commission

APR 27 1990

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ENCLOSURE 1

RESPONSE TO NOTICE OF VIOLATION  
NRC INSPECTION REPORT 50-390/89-200

Description of Violation A

10 CFR 50, Appendix B, Criterion X, requires, in part, that a program for inspection of activities affecting quality be executed by or for the organization performing the activity to verify conformance with the documented instruction, procedures, and drawings for accomplishing the activity.

Contrary to the above, the following deficiencies in TVA's Quality Control inspection program were identified:

1. Quality Control inspectors at Watts Bar plant did not verify the ratings and post installation attributes of installed devices (hand switches, indicating meters, and recorders) in the control room. The lack of QC inspector verifications was apparently a result of Nuclear Construction Department engineers eliminating inspection steps from QC records without the concurrence of the Quality Assurance Department.
2. Quality Control records used by electricians and inspectors for wiring installations referenced an uncontrolled specification. QC records for control board wiring referenced TVA Drawing 45W1640, Revision 3, which referenced Westinghouse Specification 953267. Both documents were required to complete the installation. The Westinghouse specification was not within TVA's program for controlled documents.
3. The work package data sheets that were used to document Quality Control inspections in the control room were inadequate for their various uses. Data Sheet 1 was used to document inspections of fabrication and installation of wire bundles, terminations of two separate wire ends, and installation of jumper wires. The inappropriate multiple uses of the data sheets required the addition of confusing footnotes and annotations and resulted in the inability to determine what previous activities had been performed and inspected.

This is a Severity Level IV violation (Supplement II) and applies to Unit 1.

Admission or Denial of Violation A, Example 1

TVA denies that Example 1 cited in Violation A involves a noncompliance with Criterion X of 10 CFR 50, Appendix B.

Reason for Denial of Violation A, Example 1

TVA's quality assurance (QA) program requires the site quality control (QC) organization to perform work control inspections of the critical and necessary attributes associated with the installation or modification of vendor-supplied equipment. The resistors in question are in the hand switches' internal electrical circuit associated with their status lights. The function of the hand switches is independent of these resistors. Therefore, the internal resistor rating is not considered a critical and necessary attribute and does not require QC inspection at the time of installation. However, the functionality and quality aspects of the hand switches are subject to other elements of our QA program including postinstallation testing.

WBN's Administrative Instruction (AI)-8.8 provides the administrative controls and requirements for the development, review, and approval of workplans to accomplish the various installation and modification activities performed by the construction organization (e.g., hand switch installation). Detailed instructions associated with each individual work activity required to accomplish an installation or modification (e.g., cable installation) is included in the workplan by reference to work activity procedures. The work activity procedures make use of generic data sheets that are adapted by the Nuclear Construction (NC) engineer as necessary to document the specific task associated with the work activity (e.g., wire bundle fabrication, wire termination). In generating data sheets from the work activity procedures referenced in approved workplans, either construction engineers or QC inspectors mark "not applicable" for those inspection attributes on portions of generic data sheets that do not apply due to the scope of the work performed. The program in place at the time required a back-end QA review of quality-related workplans at the time of workplan closure which provides confidence that the critical and necessary attributes have been QC inspected. TVA has recently implemented an enhanced inspection program which makes use of inspection reports (IRs) for work activities. This program will replace data sheets with IRs as appropriate in the workplans. The IRs are developed by QA on the front end to capture the critical and necessary attributes for work activities, and a technical review of the IR is performed by QA during the closure process. This enhanced inspection program provides additional assurance that critical and necessary attributes are appropriately inspected and documented.

For Example 1 cited in Violation A, the postinspection requirements that are marked as "not applicable" on the Data Sheet 1 pertain to the restoration of temporary conditions and temporary wire lifts associated with internal wiring of components. Since the work activity performed on the subject workplan did not involve temporary alterations to installed equipment, that portion of the Data Sheet 1 was correctly marked as "not applicable."

The discrepant ratings of internal resistors in the subject hand switches were identified by TVA's QC inspectors during a routine surveillance activity. Condition Adverse to Quality Report (CAQR) WBP 890515 was issued to resolve this discrepancy and was provided to NRC for review during the WBN Broad-Based Construction Assessment.

Corrective Steps Taken and Results Achieved (Violation A, Example 1)

Not applicable.

Corrective Steps Taken to Avoid Further Violation (Violation A, Example 1)

Not applicable.

Date When Full Compliance Will Be Achieved (Violation A, Example 1)

TVA is in full compliance.

Admission or Denial of Violation A, Example 2

TVA admits that Example 2 cited in Violation A involves a noncompliance with regulatory requirements. However, TVA considers some clarification to be necessary.

Reason for Violation A, Example 2

Westinghouse E-Specification 952367 (Note: the notice of violation incorrectly referenced the E-Specification as 953267) is included on drawing 45W1640 as an upper-tier source document providing reference back to the original vendor manufacturing requirements and is not required for installation or QC inspection. E-Specification 952367 indicates in its scope that it is a manufacturing specification that governs only through shipping. The necessary configuration requirements from the E-Specification were invoked through TVA drawing 45W1640. The necessary information for the internal wiring modification of the subject control boards is provided on drawing 45W1640 and the other associated design output drawings which are part of the design change notice (DCN) for that modification. The E-Specification referenced on the TVA drawing is not design output nor does it supply additional requirements for wiring installation. Therefore, TVA considers no deficient condition or violation of regulatory requirement to have occurred with the additional reference of the subject E-Specification on the TVA design output drawing.

In order to determine if the subject E-Specification was used in connection with the control room design review (CRDR) modifications, TVA has evaluated approximately 10 implementing workplans and the associated data sheets. In the course of this evaluation, TVA identified that the E-Specification was referenced on the data sheets of an implementing workplan contrary to the associated DCN requirements. TVA has determined that a construction engineer mistakenly referenced the E-Specification on the workplan data sheets. This reference of the E-Specification on the workplan data sheets constitutes a failure to follow WBN's work control program.

Corrective Steps Taken and Results Achieved (Violation A, Example 2)

TVA has issued CAQR WBN 900175 to document and resolve this issue. TVA has determined that this deficiency does not constitute a problem with the installed equipment since the E-Specification requirements referenced on the workplan data sheets are consistent with the requirements of the TVA design output drawing. Corrective actions to resolve this deficiency include:

- (a) The construction engineer has been counseled regarding this error and the importance of specifying appropriate design output documents on workplan data sheets;
- (b) Other engineers and QC inspectors will be instructed regarding the use of appropriate design documents in performing work; and
- (c) Though this deficiency appears to be a case of isolated personnel error, TVA will further determine through the condition adverse to quality process whether this deficiency could exist in other workplans.

Corrective Steps Taken to Avoid Further Violation (Violation A, Example 2)

TVA will complete any corrective steps necessary as determined by the extent of condition evaluation described above. Any additional corrective actions taken will be documented on the associated CAQR.

Date When Full Compliance Will Be Achieved (Violation A, Example 2)

TVA will be in full compliance for ongoing work with the instruction of the engineers and inspectors by May 1990. Any other examples of this deficiency will be resolved and documented on CAQR WBN 900175.

Admission or Denial of Violation A, Example 3

TVA denies that Example 3 cited in Violation A involves a noncompliance with Criterion X of 10 CFR 50, Appendix B.

Reason for Denial of Violation A, Example 3

The Data Sheet 1 identified in Violation A, Example 3, is a generic form that has been utilized up to four times for some devices to document integral parts of internal wiring modifications (i.e., wire bundle fabrication, wire bundle installation, and two separate wire end terminations). Although the same equipment number appears at the top of each data sheet, the specific activity documented can be determined by the generic notes listed in the comments section in conjunction with the applicable design output documents listed on the data sheet.

TVA admits that Data Sheet 1 appears "busy," and a new program of inspection planning and reporting has recently been implemented. This program enhancement incorporates IRs that capture the applicable inspection attributes for work activities in a checklist format. However, the subject data sheets adequately document the required inspections for the subject modification, and we do not consider a violation of regulatory requirements to have occurred.

Corrective Steps Taken and Results Achieved (Violation A, Example 3)

Not applicable.

Corrective Steps Taken to Avoid Further Violation (Violation A, Example 3)

Not applicable.

Date When Full Compliance Will Be Achieved (Violation A, Example 3)

TVA is in full compliance.

Description of Violation B

10 CFR 50, Appendix B, Criterion VII, requires, in part, that measures shall be established to assure that purchased material, equipment and services, conform to the procurement documents, and that documentary evidence shall be sufficient to identify the specific requirements, such as codes, standards, or specifications, met by the purchased material and equipment.

Contrary to the above, the following vendor equipment deficiencies that had not been detected by TVA's source inspection or QC inspection programs, and receipt inspection program deficiencies existed:

1. Undersized nozzle-to-shell welds on 8 to 12 tanks, heat exchangers, and filters.
2. Varying fastening arrangements existed among the eight fan-damper assemblies for the emergency diesel generator room exhausts. In researching procurement documents in response to these differences in bolting, TVA determined that the fan-damper assemblies had not been seismically qualified as an assembly, as required by TVA's procurement specifications.
3. Heat-shrinkable tubing did not meet vendor requirements for overlap on electrical penetration leads. The vendor requires a two-inch overlap and the heat-shrinkable tubing on all leads for penetration 27 for Train A control power had overlaps less than two inches, with several instances of 1/4- to 1/2-inch overlap.
4. Wiring with bend radius deficiencies in the diesel generator 6.9 kV control board DG-1A-A, motor control centers 1MCC-214-A1-A and 1MCC-214 B1-1, and hydrogen monitor 1-H2AN-43-200. The hydrogen monitor also contained 30 terminations which did not meet TVA's electrical specification G-38 requirements in that the wire protruded through the lug more than 1/16 inch and all strands of the wire were not terminated on the terminal screw.

This is a Severity Level IV violation (Supplement II) and applies to Unit 1.

Admission or Denial of Violation B

TVA admits the violation occurred.

Reason for Violation B

TVA concludes that the four examples of Violation B are a result of weaknesses in the vendors' QA programs as well as weaknesses in TVA's source surveillance and receipt inspection programs which failed to identify these items.

Corrective Steps Which Will Be Taken to Avoid Further Violation (Violation B)

The individual corrective action plans for each of the individual examples cited in Violation B are described in the following sections and will provide assurance that the identified vendor-supplied equipment deficiencies will be resolved in accordance with TVA design criteria.

The four examples of Violation B are associated with equipment received before 1986. As described in the TVA Nuclear Performance Plan (NPP), Volumes 1 and 4, TVA began a long-term effort in 1986 to identify and correct QA-related problems at TVA and WBN. This effort led to several changes in our QA source surveillance and receipt inspection programs. Some of the significant changes include:

- Vendor audit and surveillance organizations were combined under one manager in QA;
- Integrated audits and surveillance planning based on trending data have been incorporated;
- New contracts for QA equipment provide for TVA's right of access to vendor facilities to perform surveillances in addition to right of access to perform audits;
- Improved surveillance plans have been implemented to provide more specific requirements for reviewing vendor activities;
- QC receipt inspection procedures now provide checklists to ensure that material is received in accordance with contract requirements; and
- QC receipt inspection facilities and personnel qualification/training requirements have been upgraded.

TVA's extensive discovery/corrective action efforts described in NPP Volume 4, as well as our commitment to address the deficiencies described in NRC's Broad-Based Construction Assessment report including the corrective actions described below to address Violation B, provide reasonable assurance that vendor-related deficiencies have been or will be identified and corrected before fuel load. Corrective actions for each identified deficiency also include the evaluation of extent of condition as required by the condition adverse to quality program. A collective evaluation of the deficiencies identified in Violation B will be performed to determine if there are areas where additional corrective action may be necessary. This evaluation is currently underway, and a supplemental report describing the results will be provided by July 31, 1990.



Date When Full Compliance Will Be Achieved (Violation B)

TVA's QA source surveillance and receipt inspection programs for equipment received after 1986 are in full compliance with regulatory requirements. As noted above, a supplemental report addressing the results of the collective evaluation of the deficiencies identified in Violation B will be provided by July 31, 1990.

The following corrective actions have been identified to resolve the specific examples of Violation B associated with vendor-supplied equipment.

Corrective Steps Taken and Results Achieved (Violation B, Example 1)

As a result of NRC findings during the WBN Broad-Based Construction Assessment, CAQR WBP 890514 was issued to document and resolve the deficiencies associated with nozzle-to-shell fillet welds on tanks, filters, and heat exchangers.

TVA has inspected approximately 65 components and confirmed that this condition exists at WBN. TVA is currently developing a plan to resolve this issue based on the inspection results and other approaches taken in the nuclear industry. The results of our evaluation and the corrective actions to resolve this issue will be provided in a supplemental report by July 31, 1990.

Corrective Steps Taken and Results Achieved (Violation B, Example 2)

During the Broad-Based Construction Assessment of WBN, NRC inspectors noted that the fan-to-damper bolting arrangement for the emergency diesel generator room fans varied among the eight units. In reviewing these findings, TVA determined that the fan and damper were not seismically qualified as an assembly as required by the purchase contract. CAQR WBP 890511 was issued to document and resolve the deficiencies associated with the assemblies.

In order to resolve the identified deficiency with the subject fans and dampers, the corrective actions include the following:

- (a) TVA will evaluate the seismic qualification of the combined assembly (fan and damper together) and document the findings in a calculation report. This evaluation will determine the correct fastener details (e.g., material type, fastener size, and number of fasteners, etc.) and establish seismic qualification of the combined assembly; and
- (b) TVA will generate a DCN to correct hardware deficiencies discovered during the evaluation and document the fastener details on the vendor drawing(s).

The corrective action steps described above for the fan and damper deficiency will be complete by November 1990.

Corrective Steps Taken and Results Achieved (Violation B, Example 3)

As a result of NRC findings during the WBN Broad-Based Construction Assessment, CAQR WBP 890567 was issued to document and resolve the deficiency regarding a vendor's (Conax) use of Raychem heat shrinkable materials where seal lengths were less than required by Raychem for harsh environment qualification.

The corrective actions for the seal length deficiency include removal and replacement of the subject heat shrinkable material installations on the electrical containment penetrations associated with safety-related circuits.

The corrective action steps described above for the seal length deficiency will be complete by January 1991.

Corrective Steps Taken and Results Achieved (Violation B, Example 4)

Diesel Generator (DG) Control Cabinets

As a result of an NRC finding during the WBN Broad-Based Construction Assessment, the vendor's (Morrison-Knudsen) assistance was obtained in addressing this issue. TVA will evaluate this issue and either provide technical justification for the installed configuration or rework/replace any deficient cables identified in accordance with TVA's condition adverse to quality program by January 1991.

Motor Control Centers (MCC)

As a result of an NRC finding during the WBN Broad-Based Construction Assessment, CAQR WBP 890529 was issued to document and resolve a potential cable bend radius deficiency associated with ITE Imperial MCCs. Based on information supplied by Telemecanique (the current vendor for these MCCs) and General Electric (the cable vendor), TVA has evaluated the subject cables and has determined them to be acceptable-as-is based on the following:

- (a) The flexible strand construction allows for a smaller bend radius installation than required by the contract; and
- (b) The MCC vendors' past experience (including Telemecanique and the original vendor, ITE Imperial) indicated that this configuration will perform as designed.

Hydrogen Analyzer 1-H2AN-43-200

TVA is not aware that cable bend radius inside hydrogen analyzer 1-H2AN-43-200 was identified as an issue during the WBN Broad-Based Construction Assessment. However, TVA is reviewing this analyzer for cable bend radius deficiencies and will correct any identified deficiency in accordance with the condition adverse to quality program. As a result of the NRC finding regarding cable terminations inside the subject analyzer, CAQR WBP 890544 was issued to document and resolve this deficiency.

As a matter of clarification, Specification G-38 does not apply to the vendor requirements for this equipment. G-38 specifies requirements applicable to TVA's construction organization and was not specified in the associated hydrogen analyzer contract.

In order to resolve the identified deficiency with the subject analyzers and ensure similar deficiencies with that vendor (Comsip) are identified and resolved, the corrective actions include the following:

- (a) TVA will correct the identified condition;
- (b) The other safety-related components supplied by Comsip will be examined; and
- (c) Any similar deficiencies identified with the other Comsip-supplied components will be resolved in accordance with TVA's condition adverse to quality program.

The corrective action steps described above for the hydrogen analyzer deficiency will be complete by January 1991.

## ENCLOSURE 2

### LIST OF COMMITMENTS

1. This discrepancy [associated with the hand switches addressed in Violation A, Example 1] will be corrected in accordance with TVA's condition adverse to quality program.
2. TVA will complete any corrective steps necessary as determined by the extent of condition evaluation described above [for the deficiency addressed in Example 2 of Violation A]. Any additional corrective actions taken will be documented on the associated CAQR.
3. A collective evaluation of the deficiencies identified in Violation B will be performed to determine if there are areas where additional corrective action may be necessary. This evaluation is currently underway and a supplemental report describing the results will be provided by July 31, 1990.
4. TVA is currently developing a plan to resolve this [nozzle-to-shell fillet weld] issue based on the inspection results and other approaches taken in the nuclear industry. The results of our evaluation and the corrective actions to resolve this issue will be provided in a supplemental report by July 31, 1990.
5. The corrective action steps described above [Violation B, Example 2] for the fan and damper deficiency will be complete by November 1990.
6. The corrective action steps described above for the seal length deficiency [Violation B, Example 3] will be complete by September 1990.
7. TVA will evaluate this issue [Violation B, Example 4 regarding the DG control cabinets] and either provide technical justification for the installed configuration or rework/replace any deficient cables identified in accordance with TVA's condition adverse to quality program.
8. TVA is evaluating this analyzer [I-H2AN-43-200] for cable bend radius deficiencies and will correct any identified deficiency in accordance with the condition adverse to quality program by January 1991.
9. The corrective action steps described above [Violation B, Example 4] for the hydrogen analyzer deficiency will be complete by January 1991.