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TENNESSEE VALLEY AUTHORITY

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

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - NRC-OIE REGION II INSPECTION REPORT
50-391/86-18 AND 390/86-18 - RESPONSE TO VIOLATIONS AND DEVIATIONS

Enclosed is our response to G. G. Zech's letter dated October 28, 1986 to
S. A. White which transmitted IE Inspection Report Nos. 50-390/86-18 and
50-391/86-18, citing activities at Watts Bar Nuclear Plant which appeared to
be in violation of NRC regulations. Enclosed is our response to violations
390,391/86-18-01, 390/86-18-03, and deviations 390/86-18-06 and 391/86-18-03.

To the best of my knowledge, I declare the statements contained herein are
complete and true.

If there are any questions, please get in touch with J. A. McDonald at
(615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley
R. Gridley, Director
Nuclear Safety and Licensing

Enclosure

cc (Enclosure):

Mr. James Taylor, Director
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U.S. Nuclear Regulatory Commission
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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
RESPONSE TO NRC REGION II LETTER
FROM GARY G. ZECH TO S. A. WHITE DATED OCTOBER 28, 1986
REFERENCE: REPORT NOS. 50-390/86-18 AND 391/86-18

This report responds to the notices of violations and the notice of deviation described in enclosure 1 of the NRC Region II inspection report referenced above. This is our first report on these items of noncompliance, our final report will be submitted on or about June 30, 1987.

In addition to the specific violations and deviation, NRC expressed a concern with the implementation of TVA's Design Control Program that permitted the situations to develop. As a result, NRC requested that TVA describe actions taken or planned to improve the effectiveness of the design control program. These improvements are currently being developed as a part of the Engineering and Configuration Assurance Program (formerly Design Baseline and Licensing Verification Program) which will be discussed in detail in Volume 4 of the Nuclear Performance Plan (NPP). This is currently planned to be addressed in Section II.5.0 of the NPP.

Broader actions undertaken by TVA in response to the concern have also been described in our response to James M. Taylor's request that TVA review Sequoyah Nuclear Plant NRC Inspection Reports 50-327/86-27 and 50-328/86-27 deficiencies for applicability to WBN. TVA's response was enclosed in my letter to Mr. Taylor dated November 3, 1986 (L44 861103 808).

Violation 390/86-18-01; 391/86-18-01

- A. 10 CFR 50, Appendix B, Criterion III, as implemented by TVA's QA Topical Report, TVA-TR-75-1A, revision 8, paragraphs 17.1.3 and 17.2.3, requires that measures be established and implemented to ensure that regulatory and design bases requirements are correctly translated into specifications, drawings, and procedures and instructions.
1. Contrary to the above, the American Switch Company (ASCO) Solenoid Valves Manual NP-1 requirements to orient solenoid valves, model 206.381, vertical and upright, were not translated into installation instructions. This failure resulted in installed equipment not meeting vendor requirements.
 2. Contrary to the above, seismic requirements of IEEE 344-1975, which requires the effects of electrical connections, conduit, and sensing lines, etc., be considered were not translated into installation instructions. This failure resulted in installed equipment, as referenced in Construction Deficiency Report (CDR) WBRD 50-390/86-59, not meeting regulatory requirements.

This is a Severity Level IV Violation (Supplement II) and applies to units 1 and 2.

1. Admission or Denial of the Alleged Violation

TVA admits the violation occurred as stated.

2. Reason for the Violation, Section A, Item 1

Thus far, TVA has identified several potential contributing factors to this violation. However, a complete identification of the root cause of this violation will occur when the detailed evaluation described under corrective actions taken to avoid further violations is complete. TVA will submit a supplemental response upon completion of the evaluation.

A contributing factor to this violation was that procedures for installation and inspection did not provide acceptance criteria for the orientation attribute.

3. Corrective Actions Taken and Results Achieved, Section A, Item 1

Significant Condition Report W-415-P was initiated to document this deficiency. TVA has now qualified the ASCO 206 solenoid valves (operationally and seismically) for up to 45 degrees from vertical and upright. This was done based upon a combination of vendor certification and additional seismic qualification testing.

4. Corrective Actions Taken to Avoid Further Violations, Section A, Item 1

Procedure MAI-23, "Routing, Separation, and Interface of Instrument Lines," for maintenance and modification activities was issued, and WBN QCP-3.06-9, for construction activities, was revised prior to the issuance of this violation to include inspection requirements that will verify ASCO solenoid valve orientation.

TVA is also developing an action plan to resolve the generic implications to other ASCO solenoid valves. The following actions will be taken: 1) A review will be performed to identify those safety-related ASCO solenoid valves with specific orientation requirements. 2) A walkdown of those valves will be performed to determine the actual valve orientation. 3) A review of supplier qualifications will be performed of any installation for which the actual orientation does not agree with the ASCO installation requirements. Also, a review of data for the assembly will be performed to determine if the assembly, including the ASCO valve, was qualified in its current orientation. Any unacceptable installations will be documented via TVA's corrective action process. 4) TVA and vendor drawings will be revised as required to clearly specify the orientation requirements for the ASCO solenoid valves. 5) For any unacceptable installations identified through this walkdown, TVA will perform an evaluation to determine whether there are additional root causes applicable to this violation. Unit 2 installations have not been finalized, and conformance to the orientation requirements as specified in

the revised drawings should alleviate this condition for unit 2. Any discrepancies identified as a result of these actions will be documented and corrected via TVA's corrective action process.

With the respect to the generic implications to the seismic qualification of other equipment, TVA has undertaken a broad reevaluation. Its purpose is to respond not only to this violation but also to several other identified Conditions Adverse to Quality (CAQs) and NRC raised questions related to maintaining configuration control for seismic qualification. As a result of these concerns, a team has been established to perform the following review to ensure that regulatory and design bases are correctly translated in specifications, drawings, and instructions:

1. An assessment of the seismic qualification of equipment program from design input, design output (including vendor information), construction, operations, maintenance, and documentation of requirements.
2. An assessment of seismic qualification of equipment issues revealed by the program from employee concerns, CAQs, NRC concerns, walkdowns, and planned modifications.

The team will then define needed actions to confirm and ensure that the installed configuration of equipment is adequate for the seismic requirements and that an acceptable program is in place to ensure future modifications and maintenance activities will be adequately implemented.

1. Admission or Denial of the Alleged Violation

TVA admits the violation occurred as stated.

2. Reason for the Violation, Section A, Item 2

The cause of the violation was an ineffective interface review that resulted in a lack of recognition of a need for seismic considerations of conduit hardware installed between safety-related instruments and their respective flexible conduits. TVA construction specification G-40, Section 3.2.2.2 states "that supports for straight runs of exposed rigid metal conduit shall not exceed the maximum distances listed in the NEC for systems made up with threaded couplings. This requirement also applies where conduit bodies are attached directly to electrical equipment and isolated from the rigid conduit by flexible conduit." Even though this requirement is stated in G-40, TVA failed to provide adequate details for installation configurations in order to implement the specification.

3. Corrective Actions Taken and Results Achieved, Section A, Item 2

This condition was initially identified and documented by NCR W-416-P, which was also reported as CDR-WBRD 50-390/80-59 on May 23, 1986. Significant Condition Reports (SCR) WBN NEB 8663 R0 and SCR WBN EEB 8664 R0 were also written to include other electrical devices that have conduit routed to them. The resolution of these NCR/SCRs will also resolve the violation.

4. Corrective Actions Taken to Avoid Further Violations, Section A, Item 2

TVA will develop guidelines and design limits such that various seismically acceptable conduit installation configurations between instruments and flexible conduit can be detailed. These details will be documented on design drawings. This will provide sufficient information to then verify or rework unit 1 installations according to these design details. Unit 2 installations have not been finalized and conformance to the above requirements should alleviate this condition for unit 2.

TVA will evaluate the effects of seismic conditions when issuing design changes. This will be done as a portion of the interface reviews required by NEP 5.2; specifically design interface policy agreement CEB DI 121.03. NEP 5.2 was issued on July 1, 1986, and should enhance interdiscipline coordination. This action should prevent similar violations.

5. Date When Full Compliance Will Be Achieved

TVA will be in full compliance by unit 1 fuel load for unit 1 related items, and unit 2 fuel load for unit 2 items

Violation 390/86-18-03

- B. 10 CFR 50, Appendix B, Criterion V, as implemented by TVA's QA topical Report TVA-TR-75-1A, Revision 8, Paragraph 17.1.5 and 17.2.5, requires that activities affecting quality shall be prescribed by procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures.

1. Quality Control Procedure (QCP) L36, Revision 9, "Storage and House-keeping," requires that QC personnel remove deficiency tags after reinspection and closure of nonconforming items that have been corrected.

Contrary to the above, on July 23, 1986, deficiency tags, for deficiency report number 36-Q-1285-48-2, were found on electric spools after the QC inspector verified the items as closed on May 12, 1986.

2. Quality Control Procedure 4.23, Appendix 4, Attachment A, "Visual Examination of Support Weld Joints," allows fillet weld in any continuous weld to underrun the nominal fillet size required by 1/16-inch for a maximum length of 10 percent of the weld.

Contrary to the above, on July 30, 1986, a weld on support 70-1CC-R725 was measured with a fillet weld undersized by 1/16-inch for 25 percent of the weld length.

3. Quality Control Procedure 3.06-7, Revision 7, "Inspection of Electrical and Instrumentation Equipment Installation," requires the QC inspector to verify the installation and installation methods are in accordance with Foxboro Transmitters Models E11DM and E11GM, only two 3/8-inch diameter holes shall be drilled on the support centerline.

Contrary to the above, on August 4, 1986, Foxboro Transmitters, Model E11DM, for transmitters 1-PT-105, 1-PDT-70-126 and 1-FCV-43-63D-B, were observed installed in the containment building with six additional holes placed in the structural member of the supports.

This is a Severity Level IV Violation (Supplement II).

1. Admission or Denial of the Alleged Violation

TVA agrees with the violation as stated.

2. Reason for the Violation, Section B, Item 1

The reason for this violation is inspector oversight. Inspector No. 1 initiated deficiency 36-Q-1285-48-02 and hung required tags in accordance with procedure QCP-1.36 (L36 was an incorrect procedure reference) to identify a housekeeping deficiency. Inspector No. 2 witnessed the corrective action required to clear the deficiency. The corrective action consisted of re-reeling the cable in accordance with QCP-1.59. During the period that the corrective action was implemented, Inspector No. 1 was transferred to another unit. Inspector No. 2 forwarded the re-reel paperwork to Inspector No. 1 and based on that paperwork, Inspector No. 1 closed the deficiency. Inspector number 1 assumed that Inspector No. 2 would recover the deficiency tags; however, Inspector No. 2 did not remove the tags.

3. Corrective Action Taken and the Results Achieved, Section B, Item 1

The deficiency tags cited in this violation were removed on May 12, 1986. In addition, 13 NCRs and five housekeeping deficiencies were chosen at random for a check on deficiency and/or nonconformance tagging requirements. Ten of the NCRs were closed and tags had been removed. Three of the NCR's were open and were tagged. All five housekeeping deficiencies were closed and the tags had been removed. Therefore, TVA concluded this to be an isolated case.

4. Corrective Action To Avoid Further Violations, Section B, Item 1

The requirements to tag housekeeping deficiencies have been reviewed and TVA has decided to delete tagging requirements for housekeeping deficiencies. Tracking of housekeeping deficiencies and corrective action will be accomplished using the Storage and Housekeeping Deficiency Report, Attachment F to WBN QCP-1.36. QCP-1.36 was revised to incorporate these new requirements on November 3, 1986. TVA also reviewed its tagging requirements for nonconformances and determined that this instruction needed to be revised to more clearly state the requirements. The initiator of an NCR is now required to state on the NCR log whether or not tags were placed.

1. Admission or Denial of the Alleged Violation

TVA admits the violation occurred as stated.

2. Reason for the Violation, Section B, Item 2

The weld cited by this violation is located on support 70-1CC-R725 where the upper strut is welded to the baseplate on the wall and the bottom weld is undersized 1/16 of an inch, for more than 25 percent of the total weld. The welder failed to achieve the 1/4-inch fillet size required by the drawing and the inspector failed to identify the deficiency.

3. Corrective Action Taken and the Results Achieved, Section B, Item 2

Nonconforming Condition Report 6946, RO has been initiated to document the weld deficiency. The required rework has been added to workplan N-6946-1, which is scheduled for completion by December 29, 1986.

4. Corrective Action Taken to Avoid Further Violation, Section B, Item 2

This violation is typical of deficiencies identified by the WTG in its generic review of welding deficiencies. Therefore, completion of the WTG effort will provide adequate programmatic corrections to ensure that this violation will not recur.

1. Admission or Denial of the Alleged Violation

TVA admits the violation occurred as stated.

2. Reason for the Violation, Section B, Item 3

A reinspection of two of the three instruments cited in this violation (1-PT-3-105 and 1-PDT-70-126) determined that they were mounted properly per 47W600-19. No evidence of damage or broken ligaments as cited by the inspector could be found for these two brackets.

The original TVA designed and fabricated mounting bracket which had six holes (B-19) as required for differential pressure transmitters, was qualified as part of an assembly. This assembly was subjected to testing conditions by Wyle Lab, which would envelope the worst case conditions to which the bracket could be subjected. This bracket was intended to serve as a universal mount for Foxboro pressure and differential pressure transmitters. However, pressure transmitters require a different hole configuration from differential pressure transmitters. Two holes necessary to mount the pressure transmitters were initially omitted from the bracket. FCR I-1567 was subsequently submitted to and approved by DNE to modify the subject bracket for use in mounting Foxboro pressure transmitters. This FCR provided an appropriate basis for the inspectors acceptance of the transmitters.

From design standpoint, this proposed modification was considered acceptable since the bracket could be used in universal applications and conforms in configuration to Foxboro's original recommended mounting bracket. The TVA designed bracket had been demonstrated to have a significantly higher level of structural acceptance than the bracket offered by Foxboro. Thus, an engineering judgement was made that the proposed bracket modification to add the two 3/8-inch holes which were required to mount pressure transmitters would not invalidate the existing seismic qualification. However, this engineering judgement of the change by DNE was not documented as required.

The third instrument cited by the auditors is a flow control valve which is not mounted on a B-19 plate and was mounted on an appropriately qualified plate; however, TVA did reinspect the installation of this valve. One missing washer was noted during the inspection performed on 1-FCV-43-63D-B, 1-FSV-43-63D-B, associated limit switches, air set and tubing. The installation was checked per the vendor drawing (HOKE, N9303Q6Y-5, Revision 901) and TVA drawing 47A054-42, (reference item 81 on HOKE drawing).

3. Corrective Actions Taken and the Results Achieved, Section B, Item 3

CEB has subsequently, as of November 3, 1986, determined by analysis that the currently configured brackets are seismically acceptable for use with pressure transmitters and differential pressure transmitters. NCR-W-476-P was written to correct these deficiencies on the flow control valves for unit 1. Unit 2 installations will be inspected and documented per QCP-3.06-9.

NRC-W-476-P was written to correct the missing washer on the flow control valve for unit 1. Unit 2 installations will be written to correct the deficiencies inspected and documented per QCP-3.06-9.

4. Corrective Action Taken and the Results Achieved, Section B, Item 3

A sample inspection was performed on units 1 and 2 instrument brackets specified as Detail B-19 to identify broken and damaged plates, as cited by the inspectors. Results of this effort are documented on NCR W-487-P for unit 1 and NCR 7038 for unit 2.

5. Corrective Action Taken to Avoid Further Violations, Section B, Item 3

Any future FCRs which request a modification to a seismically qualified device will be coordinated with CEB in accordance with the requirements of CEB's design interface policy agreement CEB DI 121.03.

The problem of damaged mounting brackets for Foxboro transmitters previously was identified by TVA in NCR's 6287 and 6296. One of the corrective actions taken as a result of these NCR's include an instrumentation walkdown of which mounting brackets is an attribute. The result of these corrective actions should prevent a recurrence of this violation.

6. Date When Full Compliance Will Be Achieved, Section B, Item 3

TVA will be in full compliance by unit 1 fuel load for unit 1 items, and unit 2 fuel load for unit 2 items.

Deviations 390/86-18-06 and 391/86-18-03

Final Safety Analysis Report (FSAR) Section 6.3.2.2., "Recirculation Mode" states, in part, that to prevent large debris from entering the containment sump, trash racks, covered with 1/2-inch mesh screen are provided on each side of the sump inlet. The trash racks extend from the reactor shield wall to the divider wall from the floor to ceiling. The FSAR Figure 6.3-6 (Containment Sump), shows this 1/2-inch screen to be on the sump side of the trash rack.

The actual installation for units 1 and 2 deviates from FSAR commitments, in that 1/4-inch screen instead of the 1/2-inch mesh screen specified, is installed on the outside of the trash rack as opposed to the inside as shown on FSAR Figure 6.3-6 (Containment Sump).

Corrective Action

The original design of the trash racks called for 1/2-inch screens and grating over the containment sump (CS) and 1/4-inch mesh screen separating the intake piping from the CS free volume. In revising the sump layout to include outer trash racks, modifications were made based on scale model test results for the CS. These modifications included 1/4-inch mesh screen being used in conjunction with the outer trash racks. The scale testing modeled the 1/4-inch mesh being located on the inside of the trash racks. The as-constructed configuration has a 1/4-inch mesh screen over (outside) a 1-1/2 x 3/16-inch grating for the outside trash racks, 1-1/2-inch x 3/16-inch grating over the CS, and a 1/4-inch mesh screen separating the intake piping from CS free volume. The only difference between scale model and as-constructed configuration is that the 1/4-inch mesh on the outer trash rack is on the outside of the trash rack versus inside of the trash racks. The current design of the trash rack will have no adverse consequences on the RHR sump since scale testing verified that flow capability and sump configuration is essentially the same. The outer area trash racks have an effective screen open area which is twenty-five times larger than the combined flow area of both suction pipes. The corrective actions (Reference: Nonreportable CAQs PIR WBN NEB 8641 and PIR WBN NEB 8642) will be to revise WBN FSAR Section 6.3.2.2 to accurately describe the configuration of the containment sump. This description will include appropriate references to 1/4-inch mesh and the location of the mesh. In addition, FSAR Figure 6.3-6 will be revised to show the 1/4-inch mesh attached to the outer surface of the trash rack.

Corrective Actions Taken to Avoid Further Deviations

Actions to avoid further deviations are currently being developed as a part of the Engineering and Configuration Assurance Program (ECAP). One major task of this program is to perform a verification of the WBN FSAR against plant design. During this effort, the FSAR is being broken down into discrete units and cross-referenced to the plant design documents which accurately capture the commitments for each unit. Any identified discrepancies are to be documented and resolved as appropriate.

Dates When Corrective Action Will Be Completed

FSAR changes to Section 6.3.2.2., and Figure 6.3-6 to accurately describe the configuration of the containment sump will be submitted by unit 1 fuel load.