



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

10 CFR 2.201

November 24, 2010

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 2  
NRC Docket No. 50-391

**Subject: Watts Bar Nuclear Plant Unit 2 - Reply to Notice of Violation  
05000391/2010603-08 - Failure to Adequately Evaluate and Qualify  
Molded Case Circuit Breakers**

- References:
1. NRC letter to TVA, "Watts Bar Nuclear Plant Unit 2 Construction - NRC Integrated Inspection Report 05000391/2010603 and Notice of Violation," dated August 5, 2010 (ML102170465)
  2. TVA letter to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 - Denial of Notice of Violation (NOV) 05000391/2010603-08, Failure to Adequately Evaluate and Qualify Molded Case Circuit Breakers," dated September 7, 2010 (ML102520435)
  3. TVA letter to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 - Denial of Notice of Violation (NOV) 05000391/2010603-08, Failure to Adequately Evaluate and Qualify Molded Case Circuit Breakers - Additional Information," dated October 15, 2010 (ML102880493)
  4. NRC letter to TVA, "Response to Disputed Notice of Violation (NOV) 05000391/2010603-08," dated October 19, 2010 (ML102920665)

The purpose of this letter is to further respond to Notice of Violation 391/2010603-08, "Failure to Adequately Evaluate and Qualify Molded Case Circuit Breakers." NRC issued the NOV in a letter dated August 5, 2010 (Reference 1). TVA initially denied the violation in a letter dated September 7, 2010 (Reference 2), and provided additional information in a letter dated October 15, 2010 (Reference 3). NRC subsequently

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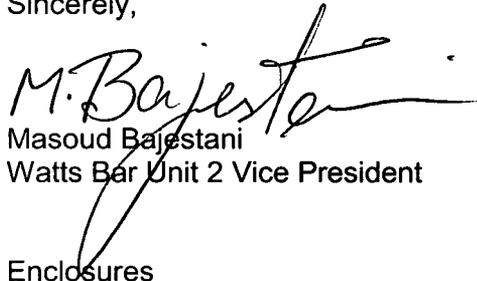
concluded that the violation occurred as stated in a letter dated October 19, 2010 (Reference 4).

TVA admits that the violation occurred and provides its reply in Enclosure 1. Enclosure 2 provides the list of commitments made in this letter.

The schedule for submitting this reply was discussed between William Crouch and Mark Lesser on November 19, 2010. If you have any questions, please contact William Crouch at (423) 365-2004.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 24<sup>th</sup> day of November, 2010.

Sincerely,



Masoud Bajestani  
Watts Bar Unit 2 Vice President

Enclosures

1. TVA's Reply to the Notice of Violation 391/2010603-08
2. List of Commitments

cc (Enclosures):

U. S. Nuclear Regulatory Commission  
Region II  
Marquis One Tower  
245 Peachtree Center Ave., NE Suite 1200  
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NRC Resident Inspector Unit 2  
Watts Bar Nuclear Plant  
1260 Nuclear Plant Road  
Spring City, Tennessee 37381

## Enclosure 1

### Watts Bar Nuclear Plant (WBN) Unit 2 "Response to Notice of Violation (NOV) 05000391/2010603-08"

#### Description of the Violation

*"10 CFR 50, Appendix B, Criterion III, "Design Control," states that measures shall be established for the review for suitability of application of materials, parts, and equipment that are essential to the safety-related functions of the structures, systems, and components (SSCs). The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Where a test program is used to verify the adequacy of a specific design feature in lieu of other verifying or checking processes, it shall include suitable qualifications testing of a prototype unit under the most adverse design conditions.*

*Contrary to the above, measures used to review the suitability of application of materials, parts, and equipment essential to the safety-related functions of molded case circuit breakers and measures to provide for the verification of checking the adequacy of design, such as, calculational methods, performing a suitable test program, including qualifications testing of a prototype unit under the most adverse design conditions, were not adequate in that:*

#### Example 1

*On October 5, 2009, the applicant installed molded case circuit breakers into the 120VAC vital instrument power boards; however, the test program used to seismically qualify a prototype circuit breaker failed to use a suitable mounting method that reflected the most adverse mounting condition."*

#### TVA Response:

TVA admits that the violation occurred.

#### Reason For The Violation - Example 1:

The reason for this violation is that Calculation WCG-ACQ-1004 failed to fully establish that (1) the 1992 test mounting represented a suitable mounting method and that (2) the 1992 test bounded the configuration of the breakers installed in 2009. The calculation should have identified that the method of support for breakers within the board was a rigid mounting system which would have justified the 1992 testing for replacement breakers.

#### Corrective Steps That Have Been Taken And The Results Achieved (Example 1):

1. TVA performed Calculation WCG-ACQ-1301 to verify the rigidity of the panel assembly.

#### Corrective Steps That Will Be Taken:

1. TVA will revise calculation WCG-ACQ-1004 to address the method of support for breakers within the board as a rigid mounting system which will validate taking credit for the 1992 replacement breaker testing.

## Enclosure 1

### Watts Bar Nuclear Plant (WBN) Unit 2 "Response to Notice of Violation (NOV) 05000391/2010603-08"

2. As an enhancement to address any potentially misaligned breakers, TVA will review WBN maintenance and Unit 2 refurbishment procedures to ensure that the design basis for the breakers is maintained by: 1) that the procedures provide sufficient guidance that the breakers make positive contact with the angles in the rear, and 2) that the breakers project appropriately through the front-face panel openings after any maintenance involving full or partial removal of the front-face panel. In addition, the review will determine whether directions are needed to avoid excessive clamping pressure and to implement simple checks to status and correct for minor irregularities in contact between the Micarta insulation board and rear angles. Based on this review, TVA will determine the appropriate implementing documents to be revised.
3. TVA will evaluate the installed breakers to ensure breaker operation will not be affected by the applied clamping breakers.

#### **Date When Full Compliance Will Be Achieved.**

TVA will be in full compliance by March 18, 2011.

#### **Example 2**

*"On September 3, 2009, the applicant failed to perform an adequate review for suitability of application parts and material used to modify dimensional critical characteristics in molded case circuit breakers; further, the applicant failed to verify the adequacy of design for the modification and the effects on essential safety related functions of the circuit breakers."*

#### **Reason For The Violation - Example 2:**

The reason for this violation is that the manufacturer made a production change to the breaker configuration but did not revise the model number or publish schematics to reflect a component change. As a result, TVA failed to identify a change in a critical characteristic (i.e., the required mounting depth between the front face and the rear angles) and the resulting impact on device seismic qualification and functionality. Rather than performing a new equivalency evaluation, TVA applied a technical evaluation for the original breakers and concluded that the breakers were seismically and functionally qualified.

#### **Corrective Steps That Have Been Taken And The Results Achieved (Example 2):**

1. TVA performed an equivalency evaluation for the reconfigured Heinemann breakers that identifies the critical characteristics, addresses the role of the Micarta insulation board in restoring the needed mounting depth for contact between the rear angles and front-face panel, and addresses seismic qualification requirements.
2. A unique identifier (CATID) was established for the reconfigured breaker to be used for future purchases of reconfigured breakers for WBN Units 1 and 2. Use of a unique ID will distinguish the reconfigured breakers from the original breakers.

## Enclosure 1

### Watts Bar Nuclear Plant (WBN) Unit 2 "Response to Notice of Violation (NOV) 05000391/2010603-08"

3. As an enhancement, TVA updated both the TVA and Westinghouse drawings to ensure consistency between drawings and with the installed configuration.

#### **Corrective Steps That Will Be Taken:**

1. Instructions will be issued to procurement and engineering organizations providing the necessary direction to use the unique CATID described above which will distinguish the reconfigured breakers from the original breakers. The CATID for original breakers will be retained to support the existing qualification of replacement original breakers procured in the past.
2. TVA will revise calculation WCG-ACQ-1004 to confirm the design basis performance of the reconfigured breaker in support of the equivalency evaluation (i.e., demonstrate the breaker will function as designed with the current configuration of breaker and spacer board attachment in the clamping arrangement of rear angles and front-face panel sections).

#### **Date When Full Compliance Will Be Achieved.**

TVA will be in full compliance by March 18, 2011.

## Enclosure 2

### List of Commitments

#### Example 1

1. TVA will revise calculation WCG-ACQ-1004 to address the method of support for breakers within the board as a rigid mounting system which will validate taking credit for the 1992 replacement breaker testing.
2. As an enhancement to address any potentially misaligned breakers, TVA will review WBN maintenance and Unit 2 refurbishment procedures to ensure that the design basis for the breakers is maintained by the following: 1) that the procedures provide sufficient guidance that the breakers make positive contact with the angles in the rear, and 2) that the breakers project appropriately through the front-face panel openings after any maintenance involving full or partial removal of the front-face panel. In addition, the review will determine whether directions are needed to avoid excessive clamping pressure and to implement simple checks to status and correct for minor irregularities in contact between the Micarta insulation board and rear angles. Based on the above review, TVA will determine the appropriate implementing documents to be revised.
3. TVA will evaluate the installed breakers to ensure breaker operation will not be affected by the applied clamping breakers.

#### Example 2

1. Instructions will be issued to procurement and engineering organizations providing the necessary direction to use the unique CATID described above which will distinguish the reconfigured breakers from the original breakers. The CATID for original breakers will be retained to support the existing qualification of replacement original breakers procured in the past.
2. TVA will revise calculation WCG-ACQ-1004 to confirm the design basis performance of the reconfigured breaker in support of the equivalency evaluation (i.e., demonstrate the breaker will function as designed with the current configuration of breaker and spacer board attachment in the clamping arrangement of rear angles and front-face panel sections).

#### Date When Full Compliance Will Be Achieved.

TVA will be in full compliance by March 18, 2011.