



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-15-079

May 1, 2015

10 CFR 2.201

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
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 (EA-14-179)**

Reference: NRC letter dated April 7, 2015, "Notice of Violation (NRC Inspection Report No. 05000391/2015614, and Investigation Report No. 2-2013-011, Watts Bar Nuclear Plant)"

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 2.201, Tennessee Valley Authority's (TVA) response to Notice of Violation EA-14-179 is enclosed.

As previously presented during the Nuclear Regulatory Commission Region II pre-decisional enforcement conference held on March 6, 2015, TVA accepts the violation and recognizes the importance of the finding. Accordingly, TVA has developed and implemented corrective actions to ensure the identified discrepancies have been corrected and will not recur.

The enclosure provides TVA's reply to the violation, including a detailed description of the corrective steps taken and the results achieved. TVA is in full compliance and will be ready by June 15, 2015 for a traditional enforcement follow-up inspection.

There are no new regulatory commitments made in this letter. Should you have questions regarding this response, please contact Gordon Arent at (423) 365-2004.

Respectfully,

  
J. W. Shea  
Vice President, Nuclear Licensing

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cc: See Page 2

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**WATTS BAR NUCLEAR PLANT, UNIT 2  
ENCLOSURE  
REPLY TO NOTICE OF VIOLATION**

**Description of the Violation**

*10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.*

*TVA Procedure MAI-5.1B, Wedge Bolt (WB) Anchor Installation, Revision 21, is the implementing/controlling process for anchor bolt installation, and includes the requirements for perpendicularity of newly installed wedge bolt anchors.*

*MAI-5.1B, Revision 21, Section 6.2.6.D, states that wedge bolt anchors shall be installed to within 5 degrees of perpendicular. Newly installed wedge bolt anchors exceeding this requirement are removed and replaced per Section 6.4 or approval of the deviation obtained from Site Engineering.*

*Contrary to the above, on or about December 19, 2011, contract employees assigned to install anchor bolts for overhead base plates, which support safety related ventilation in the containment building, willfully failed to remove and replace, or obtain site engineering approval for, newly installed wedge bolt anchors that exceeded 5 degrees of perpendicular, as required by TVA Procedure MAI-5.1B. Specifically, out of tolerance anchor bolts on hangers 86-1541 and 86-1545 were bent (straightened) to within 5 degrees of perpendicular utilizing a non-approved modified tool. All four overhead base plates of hangers 86-1541 and 86-1545 had at least one bent (weakened) bolt.*

*This is a Severity Level III violation (Enforcement Policy Sections 2.2.1.d, 6.5).*

**TVA Response**

TVA does not dispute the facts as described by the Nuclear Regulatory Commission and accepts the violation. As noted in the Notice of Violation, the violation did not result in any actual consequences; the issue was self-identified and corrected during construction.

**Reason for the Violation**

On or about December 19, 2011, a General Foreman and Foreman performed work, or directed employees to perform work, outside of the scope of the work order, invoking shortcuts to get the work completed, contrary to TVA procedure MAI-5.1B, Wedge Bolt (WB) Anchor Installation. TVA's extent of condition review determined that the inappropriate work was isolated to one crew.

## **Corrective Steps That Have Been Taken And The Results Achieved**

Upon notification of the events and circumstances surrounding this violation, Employee Concerns Program (ECP) personnel initiated file ECP-2012-WC-279-I1. A Problem Evaluation Report (PER 635002) was generated to enter the concern into the Corrective Action Program and TVA completed an apparent cause evaluation. The apparent cause evaluation prompted corrective actions which corrected the nonconforming anchor bolt installations.

Following discovery, management directed a work stoppage of anchor bolt installation. Craft work on drilling and installing anchor bolts was stopped, and anchor bolt installation retraining was conducted with emphasis on strict procedure use and adherence. This retraining also focused on criteria for contacting Engineering and obtaining Engineering authorization before drilling into rebar or other embedded features, emphasized that bending of bolts is not procedurally allowed and that scanning for rebar must occur prior to boring holes in concrete for anchor bolt installation. Additionally, a directive was issued and disseminated to applicable craft personnel to provide requirements for personnel to perform rebar scanning prior to boring holes for anchor bolts. Disciplinary actions were taken against the responsible individuals where violations of procedures and/or processes took place, including the removal of site access for the responsible Foreman.

The apparent cause evaluation and an extent-of-condition review included the following.

- Interviews were conducted with involved personnel.
- A walk down of the Unit 2 Reactor Building Annulus and South Fan Room was conducted where the bending of anchor bolts and fabrication of unapproved tools was alleged to have occurred.
- Work Orders (WOs) and their associated Drawing Revision Authorizations (DRAs) and Field Change Requests (FCRs) were reviewed where work was performed in the identified areas by the responsible individuals.
- Accountability Logs for Unit 2 Upper and Lower Containment were also reviewed to determine employees' whereabouts in comparison to the date and time recorded in the work logs of associated Work Orders.
- Rebar scanning and internal inspections using boroscoping tools were utilized to confirm design compliance and mitigate destructive testing.

The results of the interviews, walkdowns, and rebar scanning identified a baseline of suspected areas. Ultrasonic testing, fiberscope/boroscope, and destructive testing (concrete chipping to expose rebar) were used on selected hangers in Reactor Building South Fan Room and Annulus to determine the extent of damage and repairs needed. The final scope of bent bolts and damaged rebar was determined to be limited to baseplates for Hangers 197-4001, located in the Reactor Building South Fan Room, and 86-1541 and 86-1545 located in the upper dome of the Unit 2 Reactor Building.

To address the three (3) specific locations for potential for bent bolts and damaged rebar, TVA issued work orders as outlined below.

1. Removed portions of Heating Ventilation and Air Conditioning (HVAC) Support 197-4001 to allow removal of baseplate bolting, inspection of base plate bolt holes for cut rebar, and inspection of any anchor bolt damage. No nicks or cuts were found in adjacent rebar. Bolts were also examined by a Field Engineer and no adverse conditions were found.
2. Removed portions of HVAC Support 86-1541 to allow removal of baseplate bolting, inspection of base plate bolt holes for cut rebar, and inspection of any anchor bolt damage. Inspection of Section E-E baseplate revealed the meridional reinforcement was damaged during the installation of the four anchor bolts, and the bottom right anchor bolt was bent. Inspection of Section E1-E1 baseplate revealed the one meridional reinforcement was damaged during the installation of the bottom right anchor bolt, and the bottom right anchor bolt was bent. The condition of the reinforcement for both sections E-E and E1-E1 was evaluated and determined to be acceptable-as-is. All anchor bolts were removed, a structural repair of concrete performed, new anchor bolts were installed, and the plate was modified as required.
3. Removed portions of HVAC Support 86-1545 to allow removal of baseplate bolting, inspection of base plate bolt holes for cut rebar, and inspection of any anchor bolt damage. Engineering reviewed the condition of the anchor bolts and reinforcement in the vicinity of baseplates J-J and J1-J1 on hanger 86-1545. On section J-J, the hoop reinforcement was damaged during the installation of both the bottom left and bottom right anchor bolt. The meridional reinforcement was damaged during the installation of the bottom right anchor bolt. The bottom left anchor bolt was bent. On Section J1-J1, the top-right anchor location rebar was nicked, and the top-right anchor bolt was bent. The condition of the reinforcements was evaluated and determined to be acceptable-as-is. All anchor bolts were removed, a structural repair of concrete was performed, and new anchor bolts and baseplates were installed.

Engineering analysis of the bent expansion anchors demonstrated they met design criteria requirements. The damaged rebar was also evaluated by Engineering, which concluded the damaged rebar would not have affected the structural integrity of the containment building, and that the containment building would have performed its required design safety function.

### **Related Corrective Actions**

As a result of this willful violation and a previous 2010 willful violation (EA-12-021) and subsequent alternate dispute resolution resulting in a Confirmatory Order by the NRC, TVA has taken a significant number of actions addressing expectations for assuring work activities are performed in a complete and accurate manner. Specifically, the following actions were taken.

- The Chief Nuclear Officer and the Senior Vice President of Nuclear Construction issued a joint communication to all Nuclear Power Group and Nuclear Construction employees regarding expectations for assuring work activities are performed and documented in a complete and accurate manner.

- The executive management expectations (above) were reinforced through the use of fleet wide posters and communications. These communications specifically discussed 10 CFR 50.9, Completeness and Accuracy of Information, willful violations, and the consequences of non-compliance.
- TVA revised the existing Nuclear Power Group (NPG) procedure on procedure use and adherence NPG-SPP-01.2, "Administration of Site Technical Procedures" to reinforce the requirements of 10 CFR 50.9 and the need to ensure complete and accurate documentation of work completion steps. Additionally, TVA revised "Nuclear Construction Plant Procedure PP-1," "Watts Bar Nuclear Plant Unit 2 Procedure Control, BPP-01.2," "Administration of Site Technical Procedures" for Bellefonte, and BPP-01.1 "Administration of Site Technical Procedures" for Bellefonte and updated major contracts to include the requirement to comply with TVA's Procedure Use and Adherence procedures in 2012.
- TVA provided initial 10 CFR 50.9 training in 2012 (manager, supervisor and craft-level) to employees at all Nuclear Construction sites.
- TVA provided refresher 10 CFR 50.9 training in 2014 (manager, supervisor and craft-level) to Watts Bar Unit 2 employees, which will continue every two years through 2016, or until construction is complete.
- TVA enhanced existing 10 CFR 50.9 related general employee training (GET) for new employees joining Nuclear Power Group and Nuclear Construction, and updated the associated annual requalification training.
- Within six months of issuance of the Confirmatory Order and prior to July 1, 2013, TVA performed checks of the WBN Unit 2 construction contractors and subcontractors via the Employee Concerns Program (ECP), to identify undue scheduling pressure issues. Surveys were taken in December 2012 and May 2013. Issues identified were and continue to be addressed commensurate with safety and in accordance with TVA's Corrective Action Program.

In 2013, TVA performed effectiveness reviews of actions taken and actions planned, including those taken in response to the ECP checks described above. Based on the results of the effectiveness review, TVA implemented appropriate corrective actions.

### **Project Oversight:**

Broader project oversight activities are also continually being performed to assess Unit 2 performance. These activities include the following.

- Independent Project Assurance organization established and began performing assessments in Summer 2012.
- Work environment (cultural risk) assessment was initiated in conjunction with Office of Inspector General (OIG) in January 2013. The purpose of this assessment is to improve dialogue, build trust and a better work environment, identify potential risks to the project, and help ensure the project is completed in accordance with regulatory requirements.

- Nuclear Construction Review Board was established in April 2012. The board performs independent review / assessments in selected focus areas including nuclear safety culture work environment and safety concerns.
- Office of Inspector General (OIG) staff is located on site. Senior project management routinely interfaces with OIG staff as issues are identified and requests assistance with investigations as needed.
- Independent Project Review Team was established. The team provides insight to the TVA Nuclear Oversight Committee from independent nuclear experts and provides an independent perspective of nuclear safety culture.

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

TVA will continue to provide refresher 10 CFR 50.9 training (manager, supervisor and craft-level) to Watts Bar Unit 2 employees every two years through 2016, or until construction is complete.

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

TVA achieved full compliance in October 2013 when repair and reinstallation was complete for the HVAC hangers 86-1541 and 86-1545.