



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

September 13, 2013

10 CFR 21.21(d)(3)(ii)

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

Watts Bar Nuclear Plant, Unit 1  
Facility Operating License No. NPF-90  
NRC Docket Nos. 50-390

**Subject: Dresser Masoneilan Valve Stem/Plug Assemblies Found Out-of-Tolerance**

In accordance with Title 10 of the Code of Federal Regulations (10 CFR) Part 21, "Reporting of Defects and Noncompliance," the Tennessee Valley Authority is providing the required written notification of a defect in a basic component associated with a steam generator level control valve located in the Auxiliary Feedwater System. The enclosure to this letter provides the information required by 10 CFR 21.21(d)(4).

There are no new regulatory commitments contained in this letter. Should you have questions regarding this report, please contact Donna Guinn, WBN Site Licensing Manager, at (423) 365-1589.

Respectfully,

A handwritten signature in black ink that reads "Timothy P. Cleary".

Timothy P. Cleary  
Site Vice President  
Watts Bar Nuclear Plant

Enclosure: Notification of 10 CFR 21 Defect, Dresser Masoneilan Valve Stem/Plug Assemblies Found Out-of-Tolerance

cc: NRC Regional Administrator - Region II  
NRC Senior Resident Inspector - Watts Bar Nuclear Plant, Unit 1  
NRC Project Manager - Watts Bar Nuclear Plant

**Enclosure**

**Watts Bar Nuclear Plant, Unit 1**

**Notification of 10 CFR 21 Defect  
Dresser Masoneilan Valve Stem/Plug Assemblies Found Out-of-Tolerance**

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- (i) Name and address of individual informing the Commission:

Mr. T. P. Cleary  
Tennessee Valley Authority  
Vice President, Watts Bar Nuclear Plant Unit 1  
Post Office Box 2000,  
Spring City, Tennessee 37381

- (ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

Watts Bar Nuclear Plant Unit 1 (WBN1)  
Facility Operating License No. NPF-90  
NRC Docket Nos. 50-390

Basic Component: Auxiliary Feedwater Level Control Valve 1-LCV-3-156-A  
Masoneilan Model 37-20721, 4 inch Control Valve  
Stem Part No. 012160204-215-J000  
Plug Part No. 011501710-1H6U

This level control valve is a basic component which regulates auxiliary feedwater (AFW) flow to Steam Generator 2.

- (iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

Manufacturer: Dresser Masoneilan  
GE Energy  
85 Bodwell St.  
Avon, MA 02322

- (iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

Nature of Defect/Noncompliance:

The valve internals were replaced on October 7, 2009, during a refueling outage. On June 9, 2013, AFW Level Control Valve 1-LCV-3-156-A, failed its closed-to-open stroke time during quarterly surveillance testing. A Kepner-Tregoe (K-T) problem analysis revealed the direct cause was binding due to the stem/plug assembly being out of tolerance. Upon inspection, the Total Indicated Run-out (TIR) of the stem/plug assembly removed from the affected valve was determined to be 0.022 inches. Dresser Masoneilan specifies that the TIR should be less than or equal to 0.005 inches.

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Inspection of five spare un-used stem/plug assemblies in storage at WBN1 revealed that the TIR ranged from 0.006 to 0.022 inches. Because the stem/plug assembly removed from the affected AFW level control valve and five of the new stem/plug assemblies were found to be out-of-tolerance, a Part 21 exists and is being reported in accordance with 21.21(d)(3)(ii).

The AFW system is used to remove decay and stored heat from the reactor coolant system in the event of a loss of normal feedwater, a main steamline break or a small break loss of coolant accident. The safety hazard created by this defect degraded the AFW system's ability to provide feedwater flow to Steam Generator 2 via motor driven AFW Pump 1A-A. However there was no loss of safety function for the AFW system. The failure was determined to be a Maintenance Rule Functional Failure and a CC1 Functional Failure.

- (v) The date on which the information of such defect or failure to comply was obtained.

Discovery Date: June 9, 2013. The condition was initially reported to the NRC on August 16, 2013 via the Emergency Notification System under Event Notification No. 49288.

- (vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

In addition to AFW level control valve 1-LCV-3-156-A, the stem/plug assembly for AFW level control valves 1-LCV-3-148-B, -164-A, and -171-B were also replaced during the fall 2009 refueling outage. Diagnostic tests performed on the remaining three AFW LCVs in July 2013 showed no indication of sticking in the seat or erratic operation of the valves.

- (vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been taken or will be taken to complete the action.

The following actions have been entered in the corrective action program and are being tracked under problem evaluation report no. 737874.

Corrective actions taken:

1. TVA has revised Maintenance Instructions for potentially affected valves to include the requirement to measure valve stem/plug assembly for TIR prior to installation.
2. TVA has revised the vendor manual to include TIR specification for the valve stem/plug assembly.

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3. TVA has revised quarterly surveillance instructions to include a visual observation of the valve stroke during testing of the LCVs and Bypass LCVs.

The following corrective actions will be taken:

1. Procurement Engineering Group will revise procurement documentation for air and motor operated valves for receipt inspections to include the requirement to measure TIR on 10 CFR Appendix B stem assemblies, by October 2013.
  2. Mechanical Maintenance Group will disassemble and inspect the remaining AFW level control valves 1-LCV-3-148-B, -166-A, and -171-B. This action is proposed to be completed by the end of the next refueling outage, or at the first available opportunity thereafter.
- (viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensee.

Licensees should check trueness of the valve stem/plug assembly and the acceptance criteria for TIR prior to installation.