



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 20, 2011

Mr. Ashok S. Bhatnagar
Senior Vice President
Nuclear Generation Development
and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 2 – REQUEST FOR ADDITIONAL
INFORMATION REGARDING FINAL SAFETY ANALYSIS REPORT RELATED
TO SECTION 15 (TAC NO. ME4074)

Dear Mr. Bhatnagar:

By letters dated February 10 and May 24, 2011, Tennessee Valley Authority in part provided its response to a request for additional information (RAI) by the U.S. Nuclear Regulatory Commission (NRC) staff regarding the analysis of a potential chemical and volume control system malfunction that increases reactor coolant inventory as described in Chapter 15 of the Final Safety Analysis Report for Watts Bar Nuclear Plant, Unit 2.

The NRC staff has reviewed the information provided and has determined that the following information is required to complete its review. The specific questions are discussed in the enclosed RAI.

A response is required within 30 days of receipt of this letter.

If you should have any questions, please contact me at 301-415-1457.

Sincerely,

A handwritten signature in black ink, appearing to read "Patrick D. Milano".

Patrick D. Milano, Senior Project Manager
Watts Bar Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-391

Enclosure:
RAI

cc w/encl: Distribution via Listserv

Request for Additional Information

Watts Bar Nuclear Plant, Unit 2

Final Safety Analysis Report Section 15

Tennessee Valley Authority

Docket No. 50-391

By letters dated February 10 and May 24, 2011, Tennessee Valley Authority (TVA) in part provided its response to a request for additional information (RAI) by the U.S. Nuclear Regulatory Commission (NRC) staff regarding the analysis of a potential chemical and volume control system (CVCS) malfunction that increases reactor coolant inventory as described in Chapter 15 of the Final Safety Analysis Report for Watts Bar Nuclear Plant (WBN), Unit 2. The NRC staff has reviewed the information provided and has determined that the following information is required to complete its review.

FSAR Section 15.2.4, "Chemical and Volume Control System Malfunction that Results in a Decrease in Boron Concentration in the Reactor Coolant"

Section 15.4.6 of NRC Report NUREG-0800, "Standard Review Plan" [Reference 1] lists the following acceptance criteria for boron dilution event analyses:

If operator action is required to terminate the transient, the following minimum time intervals must be available between the time an alarm announces an unplanned moderator dilution and the time shutdown margin is lost:

- A. During refueling: 30 minutes.
- B. During startup, cold shutdown, hot shutdown, hot standby, and power operation: 15 minutes.

In response to the NRC staff's question RAI 15.0.0-1.b [Reference 2], TVA listed the following acceptance criteria for boron dilution event analyses:

If operator action is required to terminate the transient, the following minimum intervals must be available between the initiation of the uncontrolled boron dilution event and the time of complete loss of shutdown margin:

- a. Refueling (Mode 6): 30 minutes
- b. Startup and Power (Modes 2 and 1): 15 minutes

Consequently, TVA's analysis of the CVCS malfunction that results in a decrease in boron concentration addresses only Modes 1, 2, and 6.

1. Provide the analyses for this event in Modes 3, 4, and 5 (hot standby, hot shutdown, and cold shutdown, respectively). Initial conditions should consider the available shutdown

Enclosure

margin, reactor coolant system (RCS) pressure and charging flow, control rod positions and operability, available instrumentation and protective functions, and active RCS water volume (e.g., mid-loop operation) that are appropriate to each of these Modes.

2. List the trips, alarms, and other indications that are required to be operable in each Mode that could alert the operator to an abnormal situation involving CVCS.
3. Identify the trip, alarm, or other indication that is assumed to alert the operator to the possibility that a boron dilution event is occurring.
4. Provide a discussion that shows that the operator, working according to the applicable procedures, will locate the boron dilution source and flow path(s), and terminate the dilution flow within 15 minutes after receipt of the assumed trip, alarm, or other indication.

References:

- [1] Standard Review Plan, NUREG-0800 (formerly NUREG-75/087), Revision 1, March 2007.
- [2] Letter from M. Bajestani (TVA) to NRC, "Watts Bar Nuclear Plant (WBN) Unit 2 – Final Safety Analysis Report (FSAR) – Response to Requests for Additional Information," December 10, 2010.

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/RA/

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