

WBN2Public Resource

From: Campbell, Stephen
Sent: Wednesday, June 29, 2011 3:56 PM
To: 'wdcrouch@tva.gov'; WBN2HearingFile Resource
Cc: Raghavan, Rags; Milano, Patrick; Poole, Justin
Subject: Fw: WB2 RAI ques re B Dilution - per your request

Bill

Below is a draft RAI from SRXB regarding boron dilution. We will follow up with a formal RAI.

Sent from an NRC Blackberry
Stephen Campbell
202-527-5771

From: Miranda, Samuel
To: Campbell, Stephen
Cc: Ulses, Anthony
Sent: Wed Jun 29 15:49:59 2011
Subject: WB2 RAI ques re B Dilution - per your request

In order to complete its review of TVA's license application for Watts Bar Unit 2, the SRXB staff requests additional information regarding the applicant's analysis of the Chemical and Volume Control System Malfunction that Results in a Decrease in Boron Concentration in the Reactor Coolant (FSAR §15.2.4).

SRP Section 15.4.6 [1] lists the following acceptance criteria for B 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.

The applicant, in response to RAI question RAI 15.0.0-1.b [2], listed the following acceptance criteria for B 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, the applicant's analysis of the Chemical and Volume Control System Malfunction that Results in a Decrease in Boron Concentration in the Reactor Coolant (FSAR §15.2.4) addresses only Modes 1, 2 and 6.

1. Please provide 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 margin, 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, which are required to be operable in each Mode, and which could alert the operator to an abnormal situation.
3. Identify the trip, alarm or other indication that is assumed to alert the operator to the possibility that a B dilution event is occurring.
4. Show that the operator, working according to the applicable procedures, will locate the B 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), Rev 3, March, 2007
- [2] Letter from M. Bajestani, TVA, to USNRC, "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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From: Campbell, Stephen

Created By: Stephen.Campbell@nrc.gov

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