WBN2Public Resource

From: Lamb, John
Sent: Thursday, June 03, 2010 10:06 AM
To: Arent, Gordon; wdcrouch@tva.gov
Cc: WBN2HearingFile Resource; Wiebe, Joel; Raghavan, Rags; Milano, Patrick; Haag, Robert
Subject: For Your Review - Watts Bar Unit 2 - Preliminary RAIs - SNPB, SBPB, and CPTB
Attachments: Prelim RAIs June 2010.docx

Gordon and Bill,

Attached, for your review, are preliminary Request for Additional Information (RAI) questions regarding Watts Bar Nuclear Plant (WBN), Unit 2. Please review to ensure that the RAI questions are understandable, the regulatory basis is clear, there is no proprietary information contained in the RAI, and to determine if the information was previously docketed. Please also let me know how much time Tennessee Valley Authority (TVA) needs to respond to the RAI questions.

Thanks.
John

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PRELIMINARY REQUEST FOR ADDITIONAL INFORMATION

FOR WATTS BAR NUCLEAR PLANT, UNIT 2

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-391

Below, for your review, are preliminary Request for Additional Information (RAI) questions regarding Watts Bar Nuclear Plant (WBN), Unit 2. Please review to ensure that the RAI questions are understandable, the regulatory basis is clear, there is no proprietary information contained in the RAI, and to determine if the information was previously docketed. Please also let me know how much time Tennessee Valley Authority (TVA) needs to respond to the RAI questions.

Nuclear Performance and Code Review (SNPB)

All references to WBN Unit 1 are from the approved Final Safety Analysis Report (FSAR) Amendment No. 7. All references to WBN Unit 2 are from Amendment No. 95.

Chapter 4.4.2

> U.S. Nuclear Regulatory Commission (NRC) Information Notice 2009-23 identified that the fuel thermal conductivity experiences a 5 to 7 percent degradation for every 10 gigawatt-days per metric ton of exposure. The thermal conductivity for uranium dioxide provided in equation 4.4-1 does not take this degradation into account. All of the references that are used to generate the thermal conductivity [14, 28, 29, 30, 31, 32, 33] predate the fuel thermal conductivity experiments performed in 1990 that demonstrate the fuel thermal conductivity degradation effects. Justify the use of equation 4.4-1 given that it will over-predict the fuel thermal conductivity at higher burnups that would lead to an underproduction of fuel temperatures.

Plant Systems (SBPB)

RAI 3.6-01

Section 3.6A.2.2.2 "Blowdown Thrust Loads" contains the following equation:

$$V_E = [2g_c(P_0 - P_A)/\rho_E]^{½}$$

The equivalent equation in the WBN Unit 1 FSAR, Amendment No. 7 is:

$$V_E = [2g_c(P_0 - P_A)]^{½} /\rho_E \text{ (see page 3.6A-17)}$$

TVA is requested to clarify the differences in the two equations.

RAI 5.2.5-01

Previously there existed an intersystem leakage path “upper head injection system (UHI)”. This system is no longer described in the FSAR. TVA is requested to confirm this system is no longer included in the WBN plant and provide the basis for deleting the system.

RAI 9.2.6 – 1

In the Safety Evaluation Report related to the operation of WBN Units 1 and 2, NUREG – 0847, Supplement 12, dated October 1993, the NRC staff wrote in Section 9.2.6, Condensate Storage Facilities:

> In Section 9.2.6 of the SER, the NRC staff indicated that the two condensate storage tanks reserved 200,000 gallons of condensate for each unit's auxiliary feedwater (AFW) system. In FSAR Amendment No. 72, TVA revised this reserved amount to 210,000 gallons. The basis for the storage capacity is not affected and this correction is made for clarification purposes only. This does not change any of the NRC staff's conclusions reached in the SER or supplements related to the condensate storage facilities or the AFW system. The NRC staff's effort was tracked by TAC M85037 and M85038.

In the proposed FSAR for WBN Unit 2, Section 9.2.6.2 System Description, TVA proposal states:

> The condensate facility, shown in Figure 10.4-7, consists of one condensate transfer pump and two condensate storage tanks connected in parallel (one tank for each unit) and associated piping, controls, and instrumentation. The tanks are located in the plant yard adjacent to the east wall of the Turbine Building. The auxiliary feedwater pumps take suction directly from the condensate storage tanks to supply treated water for cooldown of the reactor coolant system. A minimum of 200,000 gallons in each tank is reserved for the auxiliary feedwater system. This quantity is assured by means of standpipes through which other systems are supplied.

The NRC staff requests TVA to justify the why the change to 210,000 gallons was not incorporated.

RAI 9.3.1 – 1

TVA provided a document titled, “FSAR Cross Referenced to SER sorted by SER, then by FSAR.” In this document under the line item SER Section 9.3.1, “Compressed Air System,” the scope identified new essential air compressors were installed. The compressed air system is a shared system between WBN Units 1 and 2. During a review of the proposed FSAR for WBN Unit 2, the NRC staff did not detect any changes.

The NRC staff requests TVA to explain whether there were any changes needed to be made to the proposed FSAR for WBN Units 1 and 2, based upon the installation of new essential air compressors.

RAI 10.3.0 Main Steam System

TVA provided a document titled, "FSAR Cross Referenced to SER sorted by SER, then by FSAR." In this document under SER Section 10.3.0, "Main Steam Supply System," TVA identifies that this section includes a review of the following FSAR sections:

- 10.3 MAIN STEAM SUPPLY SYSTEM
- 10.3.0 Main Steam Supply System 10.3.1 Design Bases
- 10.3.0 Main Steam Supply System 10.3.4 Inspection and Testing Requirements
- 10.3.0 Main Steam Supply System 10.4.11 Steam Generator Wet Layup System

During a review of the FSAR, the NRC staff noted that FSAR Section 10.4.11, "Steam Generator Wet Layup System," was not included.

The NRC staff requests TVA to justify the omission of the FSAR Section 10.4.11, to include disposition of safety-related components that were a part of this system. e.g., containment isolation valves, piping and components.

RAI 10.4.7 Condensate and Feedwater Systems

TVA provided a document titled, "FSAR Cross Referenced to SER sorted by SER, then by FSAR." I n this document under SER Section 10.4.7, "Condensate and Feedwater System," TVA identifies that this section includes a review of the following FSAR sections:

- FSAR 5.5.9 Main Steam Line and Feedwater Piping
- FSAR 10.4.7 Condensate and Feedwater Systems
- FSAR 10.4.10 Heater Drains and Vents

During a review of the FSAR, the NRC staff noted that FSAR Section 10.4.10, "Heater Drains and Vents," shows up in the table of contents, but the text section is not included.

The NRC staff requests TVA to justify the omission of the FSAR Section 10.4.10, to include disposition of any safety-related components that were a part of this system.

Component Performance And Testing (CPTB)

RAI - IST

In Amendment No. 97, TVA states that inservice testing (IST) of ASME Code Class 1, 2, and 3 pumps and valves will be conducted to the extent practical in accordance with the 2001 Edition of the ASME OM code with Addenda through 2003. This does not conform to 10 CFR 50.55a.

Title 10 of the *Code of Federal Regulations*, Section 50.55a (10 CFR 50.55a), requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) and applicable addenda.

Paragraph 10 CFR 50.55a(f)(4)(i) requires:

"Inservice tests to verify operational readiness of pumps and valves, whose function is required for safety, conducted during the initial 120-month interval must comply with the requirements in the latest edition and addenda of the Code incorporated by reference in paragraph (b) of this

section on the date 12 months before the date of issuance of the operating license under this part, or 12 months before the date scheduled for initial loading fuel under a combined license under part 52 of this chapter (or the optional ASME Code cases listed in NRC Regulatory Guide 1.192, that is incorporated by reference in paragraph (b) of this section), subject to the limitations and modifications listed in paragraph (b) of this section."

As of today, the Code of record for WBN Unit 2 should be 2004 Edition of the OM Code, (not the 2001 Edition through 2003 Addenda as stated in Amendment No. 97). Therefore, to comply with the regulation, TVA must submit its first 10-year IST program specifically for WBN Unit 2 in accordance with requirements of the applicable (2004) Edition of OM Code and modifications specified in 10 CFR 50.55a(b)(3). For example, one modification in 10 CFR 50.55a(b)(3)(ii) requires that a program be established to ensure that motor-operated valves (MOVs) continue to be capable of performing their design basis safety functions.

TVA also indicates in Amendment No. 97 that exceptions to the OM Code requirements are noted in the IST program submittal made to NRC. Exceptions to the Code requirements are allowed by NRC regulations, but they must be identified in the IST program specifically for WBN Unit 2 along with proposed alternatives and relief requests. In proposing alternatives or requesting relief, TVA must demonstrate that: (1) the alternatives will provide an acceptable level of quality and safety, (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, or (3) conformance would be impractical for its facility. The regulations in 10 CFR 50.55a authorize the Commission to approve alternatives and to grant relief from OM Code requirements upon making the necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "A Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to Code requirements that are acceptable to the NRC staff. Further guidance for developing an IST program is given in NUREG-1482, Revision 1, "A Guidance for Inservice Testing at Nuclear Power Plants," GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance ," and GL 95-07, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves."