Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

February 9, 2010

10 CFR 50.4

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 No. 50-390

Subject: **Clarification Regarding the Number of Tritium Producing Burnable Absorber Rods in Operating Cycle 10 and Program Update**

References:
1. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 1 – Issuance of Amendment Regarding the Maximum Number of Tritium Producing Burnable Assembly Rods in the Reactor Core (TAC No. MD5430)," dated January 18, 2008.
2. TVA letter to NRC, "Watts Bar Nuclear Plant (WBN) Unit 1 – Revised Technical Specifications Change WBN-TS-08-04 – Revision to the Maximum Number of TPBARS that can be Irradiated in the Reactor Core Per Cycle (TAC No. MD9396)," dated December 31, 2008.
3. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 1 – Issuance of Amendment Regarding the Maximum Number of Tritium Producing Burnable Assembly Rods in the Reactor Core (TAC No. MD9396)," dated May 4, 2009.
4. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 1 – Tritium Producing Burnable Absorber Rods (TAC No. ME2775)," dated January 5, 2010.

The purpose of this letter is twofold: (1) to provide clarification regarding the number of Tritium Producing Burnable Absorber Rods (TPBARs) loaded in the Cycle 10 core relative to the number approved by the Nuclear Regulatory Commission (NRC) in Amendment No. 77 to the Watts Bar Nuclear Plant, Unit 1, facility operating license; and, (2) to provide a description of planned future licensing actions.

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The Tennessee Valley Authority (TVA) irradiated 368 TPBARs for the U.S. Department of Energy (DOE) during Watts Bar Nuclear Plant, Unit 1, Cycle 9, which ran from March 25, 2008 to September 20, 2009, as authorized by License Amendment No. 67 issued January 18, 2008 (Reference 1). This Amendment also approved the use of the new Mark 9.2 design TPBAR which was expected to exhibit a tritium permeation rate that was less than the rate in previous cycles. In response to increased DOE tritium production goals, TVA submitted a revised License Amendment Request (LAR) dated December 31, 2008 for Cycle 10, requesting to increase the number of TPBARs from 400 to 704 (Reference 2). This request was based in part on a lower expected tritium permeation rate and also stated the planned number of TPBARs to be loaded was to be 576. The December 31, 2008 request was approved by License Amendment No. 77 transmitted by NRC letter dated May 4, 2009 (Reference 3).

During the course of Cycle 9 operation, it became apparent by February 2009 that the new Mark 9.2 design TPBARs had permeation rates higher than expected and possibly higher than that in the previous cycles, resulting in more tritium passing through the TPBARs into the reactor coolant system. Based on this information, in March 2009 TVA conservatively chose to limit the number of TPBARs to 240, instead of 576, to be irradiated in Cycle 10, which was scheduled to begin in October 2009. This decision allowed TVA to gather data from an additional cycle with the new Mark 9.2 design TPBARs and to provide additional margin to ensure TVA would stay below its regulatory limits for tritium level. DOE's contractor, Pacific Northwest National Laboratory confirmed after completion of Cycle 9 in November 2009 that calculated tritium levels, when using the latest adjusted methodology for TPBAR calculation, were essentially the same as previous cycles in which TPBARs were irradiated.

Neither the decision to irradiate only 240 versus the 576 TPBARs during Cycle 10 nor the apparent change to the calculated permeation rate observed during Cycle 9 were communicated to the NRC. TVA did enter this issue into its Corrective Action Program. The resulting evaluation has determined that while TVA made a conservative decision and reduced the number of TPBARs to 240, the NRC was not notified of these changes. This is considered inappropriate for two reasons.

1. TVA had requested that the license amendment allowing the loading of up to 704 TPBARs be approved by August of 2009 to support Cycle 10. However, before the amendment was approved by the NRC, TVA revised the number of TPBARs to be placed in the Cycle 10 reactor core to less than that which was previously approved by the NRC for the Cycle 9 core. As a result, even though TVA determined that only 240 TPBARs would be loaded into the Cycle 10 reactor core, TVA did not inform the NRC that the amendment would no longer be needed to support Cycle 10.

2. TVA based a portion of its LAR on the TPBAR performance data from Cycles 6, 7, and 8, and stated that the increase to 704 TPBARs could be accomplished even if the tritium permeation did not decrease from Cycles 6, 7, and 8. However, TVA did not inform the NRC after performance data during Cycle 9 indicated that tritium permeation values were observed to be higher than expected and possibly higher than those in Cycles 6, 7, and 8. TVA became aware of increased permeation values prior to the NRC issuing Amendment No. 77.

The decision to irradiate only 240 versus the 576 TPBARs during Cycle 10 due to the apparent change to the calculated permeation rate observed during Cycle 9 was communicated to the NRC on December 7, 2009 (Reference 4).

Accordingly, TVA has concluded that in accordance with 10 CFR 50.9, "Completeness and accuracy of information," paragraph (a), it should have notified the NRC of these changes in March 2009 when TVA determined that only 240 TPBARs would be loaded in the Cycle 10 reactor core in order to account for apparently higher than expected permeation. The reason for this lack of proper notification was that the TVA TPBAR team was focused on ensuring regulatory limits would not be exceeded during Cycle 10 to the exclusion of recognizing the requirement for the NRC to have complete and accurate information. This letter therefore constitutes TVA's notification to the NRC of changes to the TPBAR program. TVA is now evaluating if any conforming changes need to be made to the Watts Bar Nuclear Plant, Unit 1 license. TVA has evaluated the current Watts Bar Nuclear Plant, Unit 1 Technical Specifications (TS) relative to NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Ensure Plant Safety," and has concluded that with regard to the TPBARs the TS do not contain non-conservative values or specify incorrect actions.

TVA will inform NRC of the number of TPBARs planned for irradiation in Cycle 11 by no later than September 30, 2010. TVA is working with DOE to evaluate options to increase tritium production to meet Department of Defense requirements, by increasing the number of TPBARs. TVA anticipates the need to submit a License Amendment Request in late 2011 in support of Cycle 12 which is scheduled to begin in the fall of 2012.

As this information is provided for NRC information only, no NRC action is being requested at this time.

The Enclosure provides a regulatory commitment associated with this submittal. If you have any questions about this letter, please contact Kevin Casey at (423) 751-8523.

Respectfully,

R. M. Krich
Vice President
Nuclear Licensing

ENCLOSURE

cc (w/ Enclosure):

NRC Regional Administrator – Region II

NRC Senior Resident Inspector – Watts Bar Nuclear Plant

ENCLOSURE

COMMITMENT

1. TVA will inform the NRC of the number of TPBARs planned for irradiation in Cycle 11 by no later than September 30, 2010.