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

CNL-14-031

February 21, 2014

10 CFR 50.4
10 CFR 50 Appendix H

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: **Response to Request for Additional Information Regarding Revision to Watts Bar Nuclear Plant, Unit 1, Reactor Vessel Surveillance Capsule Withdrawal Schedule**

References:
1. Letter from TVA to NRC, "Revision to Watts Bar Nuclear Plant, Unit 1, Reactor Vessel Surveillance Capsule Withdrawal Schedule," dated November 22, 2013
2. Electronic Mail from NRC to TVA, "Watts Bar Nuclear Station, Unit 1 – Request for Additional Information Related to Request Change to the Reactor Vessel Surveillance Capsule Withdrawal Schedule (TAC No. MF3162)," dated February 11, 2014

By letter dated November 22, 2013 (Reference 1), the Tennessee Valley Authority (TVA) requested a change to the Watts Bar Nuclear Plant (WBN) Unit 1 reactor vessel surveillance capsule withdrawal schedule. By electronic mail (email) from NRC to TVA dated February 11, 2014 (Reference 2), TVA received a Request for Additional Information (RAI) regarding the proposed revision to the WBN Unit 1 reactor vessel surveillance capsule withdrawal schedule. The NRC requested the response by February 19, 2014. On February 19, 2014, Andrew Hon, WBN NRC Project Manager, approved a revised due date of February 21, 2014.

The enclosure to this letter contains TVA's responses to the Reference 2 RAI.

Please address any questions regarding this request to Ed Schrull at (423) 751-3850.

Respectfully,

J. W. Shea
Vice President, Nuclear Licensing

Enclosure:
Response to NRC Request for Additional Information (RAI)

cc (Enclosure):

NRC Regional Administrator - Region II
NRC Resident Inspector – Watts Bar Nuclear Plant
Director, Division of Radiological Health - Tennessee State Department of Environment and Conservation

ENCLOSURE

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT UNIT 1

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

NRC Question:

Background: In the November 22, 2013 submittal, TVA states the following in Section 4 of the Justification:

The WBN, Unit 1, Reactor Vessel Irradiation Surveillance Program complies with ASTM E-185-82 and 10 CFR 50, Appendix H, with the exception that four of the six reactor vessel irradiation surveillance capsules will receive a fluence that is 3.6 times the maximum reactor vessel fluence (i.e., a lead factor of 3.6) rather than the required lead factor of 3.0. At the time of the design of the surveillance program, all capsules were positioned as near to the vessel wall as possible and were limited to a fluence less than 3.0 times the vessel fluence. A more accurate method of calculating vessel and capsule fluence was subsequently developed which results in a lead factor of 3.6 for four of the capsules. This difference is not considered to be of any significant consequence because the test results from the encapsulated specimens will represent the actual behavior of the material in the vessel. Therefore, the evaluation of the effects of radiation on the actual vessel material is not influenced by the larger lead factor.

Issue: In contrast, the tables in Attachments 1 and 2 list the lead factors as 4.31 for Capsules V and Y.

Request: Explain the differences noted in the lead factors for Capsules V and Y. Will this affect the withdrawal schedule?

TVA Response:

Dual-specimen baskets are located on opposite sides of the core. Each dual-specimen basket contains a pair of capsules instead of a single capsule as contained by the baskets containing capsules W and Z. Capsules U and V are located in one basket; capsules X and Y are located in the other basket. The dual-specimen baskets are located such that the centerline of one of the two capsules in each basket is located at the 34.0° azimuthal location, in symmetry with capsules W and Z. However, the remaining capsule in each dual-specimen basket is offset slightly from this location, which means that the centerlines for standby capsules V and Y are actually in the 31.5° azimuthal location as compared to the typical 34.0° azimuthal location. This exposes capsules V and Y to a slightly reduced fast neutron (i.e., E > 1.0 MeV) flux as compared to the capsules aligned at the 34.0° azimuthal locations.

The changes to the withdrawal schedule for capsules V and Y are based on the future fast neutron fluence quantities projected by WCAP-16760-NP for the 31.5° azimuthal locations. As such, these projections already account for the differences in the calculated fluence that result from the azimuthal location of these capsules. The differences between the U, W, X, and Z lead factors and the V and Y lead factors did affect the calculation of withdrawal schedule for Capsules V and Y, but the effect was already accounted for in the calculation of withdrawal effective full power years that was used to generate the new schedule.