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DEC 11 1996

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket No. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION REGARDING REQUEST FOR LICENSE AMENDMENT TO
TECHNICAL SPECIFICATIONS - SPENT FUEL POOL STORAGE CAPACITY
INCREASE (TAC NO. M96930)

The purpose of this letter is to provide TVA's response to NRC's
request for additional information dated November 7, 1996. This
letter is concerned with the license amendment to the WBN
Technical Specifications for increasing the spent fuel pool
storage. The Enclosure provides the response to each of NRC's
questions.

No commitments are identified in this letter. If you should have
any questions, please contact P. L. Pace at (423) 365-1824.

Sincerely,

J. A. Scalice

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cc (Enclosure):

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QUESTION 1

Proposed TS 3.7.15 requires verification by administrative means that the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.15-1 or TS 4.3.1.1. Are there any subsequent checks for proper storage after the fuel assembly is placed in the cell?

RESPONSE 1

Yes, a surveillance instruction verifies proper storage after the fuel assembly is placed in the cell. The final check for proper storage involves verifying the identification numbers of the fuel assemblies in specific storage rack cell locations. This is followed by confirmation that the particular assemblies have initial enrichment and burnups consistent with Technical Specification (TS) Figure 3.7.15-1 and TS 4.3.1.1. Fuel movement is not considered complete until these verifications have been completed. In addition, TS 3.9.9, Spent Fuel Pool Boron Concentration, surveillance requirement verifies boron concentration in the spent fuel pool prior to movement of fuel in the pool and every 72 hours thereafter. This surveillance requirement is applicable during fuel movement in the flooded spent fuel pool. In order to terminate boron monitoring, fuel movement must be complete as discussed under "Applicability" in the TS Bases B 3.9.9. Similarly, TS 3.9.10 provides the same requirement for the cask pit.

QUESTION 2

TS 4.3.1.2 for the new fuel storage racks is not being changed. Where will fresh fuel with U-235 enrichment greater than 4.3 weight percent be stored?

RESPONSE 2

Fresh fuel purchased for Cycle 2 has a U-235 enrichment greater than 3.5 weight percent but less than 4.3 weight percent. This enrichment is still within the technical specification requirements for new fuel storage. TVA does not anticipate fresh fuel with enrichment greater than 4.3 weight percent to be stored in the new fuel storage area before fuel is purchased for Cycle 3. TVA understands that a license amendment to TS 4.3.1.2 must be requested before that time.

QUESTION 3

The description of the storage rack cell modeled in the criticality safety analyses states that the Boral plate is located in the water tight void existing between the two concentric, square stainless steel tubes. Is the encapsulated Boral vented to allow for relief of off-gases?

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RESPONSE 3

The encapsulated Boral is not vented. The outer concentric tube is folded into the inner tube at the ends and totally seal welded to isolate the neutron poison from the pool water. Without contact between water and the Boral aluminum cladding, there is essentially no off-gassing. The in-service performance of the Programmed and Remote System Corporation (PaR) storage racks (Region 1) at Sequoyah Nuclear Plant was satisfactory for 13 years; no fuel insertion or withdrawal problems were encountered. At the time of the spent fuel rack replacement in 1995 to increase Sequoyah's pool storage capacity, 901 fuel assemblies were stored in the PaR racks.

QUESTION 4

Why was Boron particle self-shielding not accounted for in the Region 2 calculations?

RESPONSE 4

The reactivity effect of particle self-shielding is known to be small for the finely divided B_4C particles used in the manufacture of Boral. Neutron attenuation measurements suggest the effect of particle self-shielding would reduce the effective Boron-10 loading by about 2 percent which is well within the manufacturing tolerance used to assure the Boron-10 loading is adequate. Currently, a significantly higher Boron-10 loading is used in practice to assure the design specifications are conservatively met. Nevertheless, if the conservative estimate of a $0.0030 \Delta K_{eff}$ effect of particle self-shielding [page 4-12] is assumed to be added to the maximum K_{eff} values in Table 4.5.12, the maximum K_{eff} for Region 2 storage still remains below the regulatory limit of 0.95.

QUESTION 5

Should the method bias given as 0.00727 in Table 4.3.2 actually be 0.00827?

RESPONSE 5

The method bias 0.00727 in Table 4.3.2 is correct. The KENO method bias referred to in Table 4.3.2 is described in Section 4.2.1 under the heading KENO-5 (pages 4-4 and 4-5). The KENO method bias is 0.00727 ΔK based on comparison with benchmark cases. As described in the paragraph following the discussion of the method bias, the average uncertainty in the KENO results was determined to be 0.00827 ΔK . In addition, the last paragraph under the header KENO-5 explains that this uncertainty was increased by 0.00182 ΔK (i.e., $0.00827 + 0.00182 = 0.01009 \Delta K$) to account for enrichment extrapolation of the

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benchmark cases. This KENO uncertainty (i.e., 0.01009 ΔK) is included in the uncertainties of Table 4.3.2.

QUESTION 6

Revised Bases B 3.7.15, Spent Fuel Assembly Storage, seems to imply that there are 449 storage positions in the Region 2 burnup credit rack modules and 225 additional positions in the cask pit. Should this section be reworded to clarify the storage capacities?

RESPONSE 6

There are a total of 449 storage positions in the Region 2 burnup credit rack modules; 224 of the positions are in the spent fuel pool, and 225 are in the cask pit module. The sentence which begins "In addition, the Region 2 rack...." is intended to indicate that fresh (new) fuel with enrichment of 4.95 ± 0.05 weight percent can also be stored in the Region 2 rack in the cask pit loading area (the 15 x 15 array) when placed in storage locations which have empty face-adjacent storage cells. To clarify this paragraph, the sentence has been modified to delete the words "In addition," and insert "also" before "designed" to indicate that the cask pit area of Region 2 is designed to store new fuel as well as spent fuel. The modified Technical Specification Bases page B 3.7.75 and the draft markup of the page, are attached to this enclosure.