Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

SEP 10 2003

WBN-TS-03-02

10 CFR 50.90

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 - TECHNICAL SPECIFICATION (TS) CHANGE 03-02, "REVISION OF BORON REQUIREMENTS FOR COLD LEG ACCUMULATORS AND REFUELING WATER STORAGE TANK" - RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MB 9480)**

The purpose of this letter is to provide TVA's response to an NRC request for additional information (RAI) received via email on September 2, 2003, and to provide a minor clarification regarding information previously provided by TVA letter dated August 18, 2003. Subsequent to the receipt of the RAI, a teleconference was held on September 4, 2003, between TVA, NRC, and Westinghouse. As a result of this teleconference, it was agreed that TVA would provide the subject response.

Enclosure 1 provides TVA's response to each of the three NRC questions. Enclosure 2 provides a replacement page for page E1-9 of TVA's letter dated August 18, 2003, which reflects the clarification made to that page. This clarification does not change any of the conclusions contained in the August 18, 2003, letter.

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There are no regulatory commitments associated with this submittal. If you have any questions, please contact me at (423) 365-1824.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 10th day of September 2003.

Sincerely,

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures
cc: See page 3

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cc (Enclosures):
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ENCLOSURE 1
WATTS BAR NUCLEAR PLANT, UNIT 1
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1. **(RAI I.A.) - For this amendment, WBN is taking partial credit for containment spray volume. This is a different and new input assumption compared to the original WBN TPBAR submittal. Please explain what is meant by 'partial credit,' and why partial credit is acceptable.**

   Response:

   Up to the time of switchover to cold leg recirculation Reactor Coolant System (RCS), Refueling Water Storage Tank (via containment spray and emergency core cooling paths) and Ice Melt are assumed to dump into the active sump. The volume of liquid involved exceeds the total volume of the active sump. It is assumed that the active sump spills into the reactor cavity via the RCS nozzle penetrations and into the raceway via crane wall penetrations. The liquid in the reactor cavity, raceway, and active sump have boron concentrations which are relatively high. The liquid in the reactor cavity and raceway are removed from the calculation. This results in partial credit for containment spray and also represents a better accounting of water distribution post accident. Therefore, partial credit for containment spray is acceptable.

2. **(RAI III.A) - Only the 0 - 240 TPBAR range is being requested and will be added to the TSs at this time. During a previous phone call with the staff, WBN stated that the limiting cases listed in Table 1 are all Hot Leg break cases, and that Cold Leg break cases would become limiting if control rod insertion was no longer assumed. This RAI response states that the Cold leg break is now limiting and lists the assumptions applied. The requested boron concentrations (in the marked-up TS pages) appear to be taken from the 241 - 1000 TPBAR range (Hot Leg Break, case 2) in Table 1. Please discuss the analyses/evaluations performed to justify these boron concentrations are acceptable for the 0 - 240 TPBARs with a cold leg break. Also, please provide the critical and sump boron concentrations to show the margin available.**

   Response:

   Two analyses were performed to verify that the 3100 ppm RWST and 3000 ppm CLA boron concentrations are acceptable for 0 - 240 TPBARs. Both analyses assumed TPBAR failure and no control rod insertion.

   The first analysis corresponds to the long term subcriticality calculation in which xenon is assumed to be completely decayed away. For this case, a sump boron of 2078 ppm and a critical

boron of 1943 ppm were calculated. Thus, the subcriticality margin was 135 ppm.

In the second analysis, subcriticality at the time of hot leg switchover was evaluated three hours after the initiation of the event. In this case, some credit for xenon is assumed. For this scenario, a sump boron of 1799 ppm and a critical boron of 1733 ppm were calculated. Thus, the subcriticality margin for this case was 66 ppm.

3. **(RAI V) - WBN states that the feedline break, steamline break, and inadvertent ECCS actuation events are the only non-LOCA events potentially impacted by changes in RWST and CLA boron concentrations. The ECCS actuation and SLB events are discussed in Section 2.15.2 of Watts Bar TPBAR Topical Report NDP-00-0344. The feedline break was not discussed in that report. Please describe why the feedline break event is not adversely affected by the proposed boron concentrations.**

Response:

The feedline break event is not adversely affected by the proposed boron concentrations because low boron concentrations are conservative with respect to the concerns of the event. The current licensing basis analysis assumes a conservative RWST and accumulator boron concentration of 2000 ppm.

**ENCLOSURE 2**
**REPLACEMENT PAGE E1-9 FOR**
**PREVIOUS LETTER DATED AUGUST 18, 2003**

ENCLOSURE 1
WATTS BAR NUCLEAR PLANT, UNIT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**VII. Section 4 of the LAR submittal states that the required boron concentration considers the "reactivity holddown effect," and the effects of possible leaching of the lithium following a LOCA. Please provide a description of how these effects impact the boron concentration requirements, and provide representative values which demonstrate the magnitude of the impact on the required boron concentration.**

The subcriticality calculations for the cold leg break case considered TPBAR failure. It is assumed that 12 inches of pellets are lost and 50% of the lithium instantaneously leaches from the TPBARs. Since the lithium in the TPBARs reduces core reactivity (reactivity holddown), loss of this material has the effect of increasing core reactivity and the critical boron concentration at post-LOCA conditions. For a case with the maximum number of TPBARs (2304), the effect of leaching and pellet loss was an increase of 336-352 ppm in the critical boron concentration at the limiting burnup step. For the 0-240 case, with up to 240 TPBARs, the critical boron increase was proportionally smaller - less than 40 ppm.

Since the RWST and CLA volumes represent only a portion of the fluid that is mixed in the sump, their boron concentrations would have to increase by more than the values above to have comparable subcriticality margin at both the time of HSLO and in the long term.