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

John A. Scalice
Site Vice President, Watts Bar Nuclear Plant

TVA-WBN-TS-97-001

APR 3 0 1997

10 CFR 50.90
10 CFR 50.91

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

Gentlemen:

In the Matter of)
Tennessee Valley Authority)

Docket Nos. 50-390

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - TECHNICAL SPECIFICATIONS (TSs) CHANGE 97-001 - TRITIUM PRODUCING BURNABLE ABSORBER ROD (TPBAR) LEAD TEST ASSEMBLIES (LTAs)

In accordance with the provisions of 10 CFR 50.90, TVA submits this request for an amendment (TS 97-001) to Appendix A of license NFP-90, WBN Unit 1 TSs. The proposed amendment would change the design features section to provide for insertion of LTAs containing TPBARs in the WBN reactor core during cycle 2. The purpose of the change is to provide irradiation services to support U.S. Department of Energy (DOE) investigations into the feasibility of using commercial light water reactors to maintain the DOE inventory of tritium.

This change is justified based on extensive analysis, testing and evaluation of the TPBARs as reported in DOE Technical Report PNNL-11419, Revision 1, dated March 1997. The technical report documents specific evaluations for WBN which demonstrate that the TPBARs will be reliable and do not pose a concern for plant operation.

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NRC's review of the technical report is in progress. TVA is submitting this license amendment request to maximize the available review time for NRC review. TVA intends to supplement this request with additional information to address any plant specific issues raised during NRC's review of the technical report. TVA expects issues regarding TPBAR design and fabrication to be resolved by DOE.

TVA has determined that calculated doses in the unlikely event of a large loss of coolant accident are increased by a very small amount; therefore, a license amendment is being submitted. TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

The WBN Plant Operations Review Committee and the WBN Nuclear Safety Review Board have reviewed this proposed change and have determined that operation of WBN Unit 1 in accordance with the proposed change will not endanger the health and safety of the public.

In accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Tennessee State Division of Radiological Health.

Enclosure 1 to this letter provides the description and evaluation of the proposed change. This includes TVA's determination that the proposed change does not involve a significant hazards consideration.

Enclosure 2 contains marked-up copies of the appropriate page from current Unit 1 TS to show the proposed change.

Enclosure 3 forwards the revised current TS which incorporate the proposed change.

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Enclosure 4 forwards a copy of Technical Report PNNL-11419, Revision 1, dated March 1997.

Enclosure 5 provides information addressing operation of Watts Bar Unit 1 with TPBAR LTAs.

Enclosure 6 provides a list of commitments for this submittal.

Irradiation of the LTAs needs to be completed during WBN Unit 1 Cycle 2 to support the DOE schedule for a decision on using commercial light water reactors for tritium production. Accordingly, TVA is requesting review of the proposed TS change with sufficient lead-time to support loading LTAs into the reactor core in early September 1997.

TVA requests that the revised TS be made effective immediately upon NRC approval. If you have any questions about this change, please telephone P. L. Pace at (423) 365-1824.

Sincerely,

R. Purcell for

J. A. Scalice

Enclosures
cc: See page 4

Subscribed and sworn to before me
on this 30 day of April 1997

Judy C. Lancaster
Notary Public

My Commission Expires 2-28-2001

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cc (Enclosures):

Mr. Mark S. Lesser, Chief
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

NRC Resident Inspector
WBN Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Mr. Robert Martin, Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. Michael H. Mobley, Director
Division of Radiological Health
3rd Floor
L & C Annex
401 Church Street
Nashville, Tennessee 37243

50-390 WATTS BAR 1 TVA

TECH SPECS CHANGE 97-01, TRITIUM PRODUCING BURNABLE ABSORBER ROD LEAD TEST ASSEMBLIES

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-97-001
DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

I. DESCRIPTION OF THE PROPOSED LICENSE AMENDMENT

A change is requested to the current WBN Unit 1 TSs to provide for insertion of four lead test assemblies containing up to a total of 32 tritium producing burnable absorber rods (TPBARs) into the Unit 1, Cycle 2 reactor core. After a single operating cycle of irradiation, the TPBARs will be removed from the reactor and stored in the spent fuel pool. The TPBARs will be placed in shipping casks and transported off-site under Department of Energy (DOE) control.

The specific change is described below:

Current TS page - 4.0-1.

In paragraph 4.2.1, an additional sentence will be added to existing text as follows: "For Unit 1, Cycle 2, WBN is authorized to place a limited number of tritium producing burnable absorber rod lead test assemblies into the reactor in accordance with TVA's application dated April 30, 1997."

II. REASON FOR THE PROPOSED LICENSE AMENDMENT

The purpose of providing irradiation services to DOE is to verify that DOE tritium production experience and prototypical tests transfer to production in a commercial light water reactor. Specifically, the LTAs will demonstrate the production systems and capabilities necessary to safely produce and contain tritium in a commercial light water reactor.

TVA has reviewed the results of dose analyses and has determined that there are very small increases in radiological consequences for certain postulated events with LTAs. Accordingly, the change is being submitted for review by NRC prior to operating with

LTAs. Approval of the proposed section 4.2.1 revisions will document NRC's review.

III. SAFETY ANALYSIS

The proposed change is justified based on detailed evaluations and analyses performed by DOE, its subcontractors, and TVA as described in DOE Technical Report PNNL-11419, Revision 1, dated March 1997. The report was based on plant parameters taken from the WBN FSAR. Except where noted otherwise, the data and evaluations provided in PNNL-11419, Revision 1 are based upon the design and operational practices of WBN Nuclear Plant, and they are considered to be bounding. The portions of the technical report which are associated only with the effectiveness of tritium production are not considered applicable to this amendment request.

As part of the process of incorporating TPBAR LTAs into WBN operating Cycle 2, TVA and Westinghouse will perform plant-specific reload safety evaluations in support of the Cycle 2 core reload.

IV. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TVA has concluded that operation of WBN in accordance with the proposed change to the TS does not involve a significant hazards consideration. TVA's conclusion is based on its evaluation, in accordance with 10 CFR 50.91(a)(1), of the three standards set forth in 10 CFR 50.92(c).

A. The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

LTAs do not adversely affect reactor neutronic or thermal-hydraulic performance; therefore, they do not significantly increase the probability of accidents or equipment malfunctions while in the reactor. The neutronic behavior of the LTAs mimics that of standard burnable absorbers with only slight differences which are accommodated in the core design. The reload safety analysis performed for WBN Unit 1, Cycle 2 will confirm that any minor effects of LTAs on the reload core will be within established fuel design limits.

As described in DOE Technical Report PNNL-11419, Revision 1, the LTA design is robust to all accident conditions except the large loss of coolant accident where the rods are susceptible to failure. However, the failure of the small number of TPBARS rods has been determined to have an insignificant effect on the thermal hydraulic response of the core to this event.

The impacts of LTAs on the radiological consequences for certain postulated events are very small, and they remain within 10 CFR 100 regulatory limits. The additional offsite doses due to tritium leakage from the containment are small with respect to loss of coolant accident source terms and are well within regulatory limits.

The LTAs will not result in an increase in combustible gas released to the containment. Therefore, the LTAs do not result in a significant increase in the consequences of those previously considered.

Analysis has shown that TPBARs will not fail during Condition I through IV events, with the exception of a Large Break LOCA. The radiological consequences of the non-Large-Break LOCA events are essentially unchanged by the expected TPBAR tritium leakage to reactor coolant, and doses remain within a small fraction of 10 CFR 100 regulatory limits. Therefore, there is no significant increase in the consequences of these previously evaluated accidents.

The expected occupational and offsite doses, as reported in Technical report PNNL-11419, Revision 1, resulting from release of tritium from TPBARs over the plant operating cycle, including refueling, are not significantly increased and are within applicable regulatory limits.

B. <u>The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.</u>

LTAs have been designed to be compatible with existing Westinghouse 17x17 fuel assemblies and

conventional Burnable Poison Rod Assembly (BPRA) handling tools, equipment, and procedures, and therefore no new accidents or equipment malfunctions are created by the handling of LTAs.

LTAs use materials with known and predictable performance characteristics and are compatible with PWR coolant. The LTA design has specifically included material similar to those used in standard burnable absorber rods with the exception of internal assemblies used in the production and retention of tritium. As described in the technical report, these materials are compatible with the reactor coolant system and the core design. For the irradiation proposed, the quantities of these materials is small. Therefore, no new accidents or equipment malfunctions are created by the presence of the LTAs in the reactor coolant system.

Thermal-hydraulic criteria have been established to ensure that TPBARs will not fail during Condition I or II events. Analysis has shown that TPBARs, appropriately positioned in the core, operate within the established thermal-hydraulic criteria. Therefore, no new accidents or equipment malfunctions are created by the presence of the LTAs in the reactor.

Analysis has shown that TPBARs will not fail during Condition III and IV events, with the exception of a large-break loss-of-coolant-accident. The radiological consequences of these events are small, with doses that are a small fraction of the 10 CFR 100 limits. Therefore there is no significant increase in consequences of these previously evaluated accidents.

LTAs do not adversely affect reactor neutronic or thermal-hydraulic performance; therefore, they do not create the possibility of accidents or equipment malfunctions of a different type than previously evaluated while in the reactor.

C. **The proposed amendment does not involve a significant reduction in a margin of safety.**

LTAs do not adversely affect reactor neutronic or thermal-hydraulic performance. Analysis indicates that reactor core behavior and offsite doses remain relatively unchanged. TPBAR performance under Condition I, II, III, and IV events are very similar to standard burnable absorber rods previously evaluated. For these reasons, the proposed amendment does not involve a significant reduction in a margin of safety.

V. ENVIRONMENTAL IMPACT CONSIDERATION

The proposed change does not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or a significant increase in individual or cumulative occupational radiation exposure. The LTA design leakage goal for tritium is less than 6.7 Ci/yr per rod. Given this design limit, WBN tritium releases during cycle 2 will remain less than that described in the Revised Final Environmental Impact Statement. For these reasons, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-97-001
MARKED PAGES

I. AFFECTED PAGE LIST

Unit 1 - page 4.0-1

II. MARKED PAGES

See attached.