April 19, 2004

Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 — ISSUANCE OF AN AMENDMENT REGARDING THE SOURCE RANGE NEUTRON FLUX REACTOR TRIP FUNCTION RESPONSE TIME TEST (TAC NO. MC0485)

Dear Mr. Scalice:

The Commission has issued the enclosed Amendment No. 52 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant, Unit 1. The amendment approves changes to Technical Specification 3.3.1 regarding the source range neutron flux reactor trip function response time test. This amendment is in response to your application dated August 22, 2003, as supplemented on March 19, 2004.

A copy of the safety evaluation is also enclosed. Notice of issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Margaret H. Chernoff, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosures: 1. Amendment No. 52 to NPF-90
2. Safety Evaluation

cc w/enclosures: See next page

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATTS BAR NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 52
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (TVA or the licensee) dated August 22, 2003, as supplemented by letter dated March 19, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-90 is hereby amended to read as follows:

   (2) Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 52, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

William F. Burton, Acting Chief, Section 2
Project Directorate II
Division of Project Licensing Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: April 19, 2004

ATTACHMENT TO AMENDMENT NO. 52

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace the following page of the Appendix A Technical Specifications with the attached page. The revised page is identified by amendment number and contains a vertical line indicating the area of change.

Remove Page	Insert Page
3.3-16	3.3-16

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 52 TO FACILITY OPERATING LICENSE NO. NPF-90

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

1.0 INTRODUCTION

By letter dated August 22, 2003, as supplemented on March 19, 2004 (ADAMS Accession Nos. ML032400448 and ML040850112, respectively), the Tennessee Valley Authority (licensee) submitted a request for approval of changes to the Technical Specifications (TSs) for Watts Bar Nuclear Plant (WBN), Unit 1. The changes would revise TS Table 3.3.1-1, "Reactor Trip System Instrumentation," to add a requirement to perform response time testing on the source range neutron flux monitors.

The supplemental letter provided clarifying information that did not expand the scope of the original amendment request and did not change the initial proposed no significant hazards consideration determination.

2.0 REGULATORY EVALUATION

In its Nuclear Safety Advisory Letter NSAL-00-016, dated December 4, 2000, Westinghouse identified an issue regarding the protection functions assumed for the typical Final Safety Analysis Report (FSAR) analysis of the Uncontrolled Rod Cluster Control Assembly Bank Withdrawal from a Low Power or Subcritical Condition event (RWFS). The primary protection for this event is provided by the Power Range Neutron Flux - Low Setpoint. In NSAL-00-16, Westinghouse stated that for an RWFS event during plant operation in Modes 3, 4 or 5, where the Power Range Neutron Flux - Low Setpoint is not required to be operable, the source range reactor trip function is implicitly credited as the primary protection function in the typical analysis. That is, it is assumed that an RWFS event occurring in Modes 3, 4, or 5 is bounded by the standard FSAR RWFS analysis performed in Mode 2, based on implicitly crediting the source range reactor trip function. The licensee stated that this TS amendment request was the result of the review of NSAL-00-016. The licensee further stated that the response time of the source range reactor trip function must be verified consistent with the analysis assumptions.

The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, General Design Criteria (GDC) 13, “Instrumentation and control,” and 20, “Protection system functions,” are directly applicable to this proposed change. GDC 13 requires, in part, that instrumentation be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary and the containment and its associated systems. GDC 20 requires that the protection system be designed to initiate automatically the operation of appropriate systems to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences. To assure that the conditions of GDC 13 and 20 are met, 10 CFR 50.36(c)(3), requires that TSs include surveillance requirements relating to tests to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions of operation will be met.

3.0 TECHNICAL EVALUATION

The RWFS event is addressed in Section 15.2.1 of the WBN Unit 1 Updated FSAR (UFSAR). The analysis is performed assuming bounding Mode 2 initial conditions, and primary protection is provided by the Power Range Neutron Flux-Low Setpoint. This trip function is required to be operable during Modes 1 and 2 and has a TS response-time requirement of 0.5 seconds, consistent with the UFSAR accident analyses.

The source range reactor trip function is also identified in the UFSAR as being available to terminate this event; however, it is not explicitly credited in the analyses. Rather, it is assumed that an RWFS event that occurs in Modes 3, 4 or 5 is bounded by the UFSAR analysis performed for Mode 2 with an implicit credit given to the source range trip function.

Verification of the response time per the TS ensures that protective function actuation times are less than or equal to the values assumed in the UFSAR accident analyses. Thus, a required periodic response-time testing of the source range reactor trip function, to assure that a value of 0.5 seconds is not exceeded, will provide assurance that a RWFS event in Modes 3, 4 or 5 will remain bounded by current analyses.

Not all components within the source range nuclear flux trip function will be physically tested. WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. Use of WCAP-14036-P-A for WBN was approved in License Amendment No. 24, dated June 13, 2000 (ADAMS Accession No. ML003724116). WCAP-14036 allowed, in some instances, response time to be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. In the case of the source range nuclear flux trip function, the response time will be verified by a combination of measured and allocated response times.

The licensee has stated that the Gamma-Metrics Source Range Nuclear Instrumentation used at WBN was not evaluated in WCAP-14036, and, therefore, the response time of this equipment will be verified by an actual test. The response time of the signal processing portion of the source range trip channels will be determined by injecting a signal into the input of the wide range amplifier and measuring the time until a channel trip output is generated by the source range trip bistable. The licensee has also stated that the neutron detectors are exempt from response time testing. The Solid State Protection System logic will not actually be tested, as an allocated response time was provided and approved for WBN. Additional tests measure the reactor trip breaker response time and control rod gripper release delay time. The results of the tests are summed with the allowance for the actuation logic to verify that the total response time for the trip function is less than 0.5 seconds.

The staff has confirmed that the Solid State Protection System relays used by WBN were evaluated in WCAP-14036-P-A. The staff concurs that use of an allocated response time rather than actual test is appropriate in this instance, and that the Gamma-Metrics Source Range Nuclear Instrumentation System used at WBN, not evaluated in WCAP-14036-P-A, will require actual response time test.

The staff has reviewed the licensee's proposed TS change that will revise Table 3.3.1-1 (page 2 of 9), Reactor Trip System Instrumentation, of the WBN Unit 1 TS by adding Surveillance Requirement 3.3.1-15 to Function 5, "Source Range Neutron Flux." Concomitant with this revision, the licensee will revise Table 3.3.1-1 of the Technical Requirements Manual to include the required function response time of less than or equal to 0.5 seconds. The staff finds that the addition of this Surveillance Requirement to the WBN TSs complies with the conditions set forth in GDC 13 and 20 and the associated requirements of 10 CFR 50.36 and is, therefore, acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (68 FR 54753). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Yuri Orechwa
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Date: April 19, 2004

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WATTS BAR NUCLEAR PLANT

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