

September 8, 2003

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
FOR THE 120V AC VITAL INSTRUMENT POWER SYSTEM (TAC NO. MB8749)

Dear Mr. Scalice:

The Commission has issued the enclosed Amendment No. 45 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant (WBN), Unit 1. The amendment consists of a change to Technical Specification (TS) 3.8.7, "Inverters - Operating," and is in response to your application dated May 1, 2003, as supplemented on July 8, 2003.

The revised TS would require only one inverter for each of the four instrument channels. This is the initial phase of a project that will update the 120V AC vital instrument power system at Watts Bar.

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. 45 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. 45
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated May 1, 2003, as supplemented on July 8, 2003, 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. 45, 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 prior to MODE 4 entry following the next refueling outage in the fall of 2003.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by M.Marshall acting for/

Allen G. Howe, 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: September 8, 2003

ATTACHMENT TO AMENDMENT NO. 45
FACILITY OPERATING LICENSE NO. NPF-90
DOCKET NO. 50-390

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove Pages

3.8-37
B3.8-81
B3.8-82
B3.8-83
B3.8-86

Insert Pages

3.8-37
B3.8-81
B3.8-82
B3.8-83
B3.8-86

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 45 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 May 1, 2003, as supplemented by letter dated July 8, 2003, (ADAMS Accession Nos. ML031260181 and ML031920663, respectively), the Tennessee Valley Authority (the licensee), submitted a proposed change to the Technical Specifications (TSs) for Watts Bar Nuclear Plant (WBN), Unit 1. The proposed change would modify TS 3.8.7, "Inverters - Operating."

The 120V AC vital power system is a Class 1E system that provides a source of instrument and control power for reactor protection circuits and other critical instrumentation systems and components within the plant. The system is configured and the loads arranged to preclude the loss of any redundant essential or protective function due to a single failure within the system. The system currently consists of eight uninterruptible power supplies, eight 120V AC vital instrument power boards, and protective devices. Each unit has four identical power channels with the equipment of each channel being electrically and physically independent from the equipment of the other channels so that a failure in one channel will not cause a failure in another channel. Some of the vital power boards used for Unit 1 operation are powered from Unit 2 inverters.

Currently the TS requires two operable inverters for each of four channels. The revised TS would require one operable inverter for each of the four channels. This change would allow the Unit 2 vital power boards required for Unit 1 operation to be powered from the Unit 1 inverters and the Unit 2 inverters to be abandoned. The licensee stated that this proposed amendment is the initial phase of a project that will replace the vital inverters to achieve improvements in the reliability of the 120V AC vital instrument power system. In addition, the licensee has revised the appropriate TS Bases to reflect this change.

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

2.0 REGULATORY EVALUATION

The regulatory requirements that are applicable to onsite power distribution systems include Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, General Design Criterion (GDC) 5, "Sharing of structures, systems, and components," which states, in part, that "structures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions . . . ," and GDC 17, "Electric Power Systems," which requires in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. In addition, GDC 17 requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as the result of loss of power from the unit, the offsite transmission network, or the onsite power supplies. Additionally, GDC 18, "Inspection and Testing of Electric Power Systems," requires that electric power systems important to safety be designed to permit appropriate inspection and testing. Furthermore, guidance is provided in Regulatory Guide 1.81, "Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants."

In NUREG 0847, "Safety Evaluation Report related to the operation of Watts Bar Nuclear Plant, Units 1 and 2," dated June 1982, the U.S. Nuclear Regulatory Commission (NRC) staff examined the issue of AC and DC Distribution Systems shared between Watts Bar Units 1 and 2, and concluded that the design met the guidelines of Regulatory Guide 1.81 and was acceptable.

3.0 TECHNICAL EVALUATION

Currently, there are four 120V AC vital power boards per unit (total of eight) and each receives power from its own dedicated inverter. Some loads necessary to operate Unit 1 are currently supplied by the Unit 2 vital power boards, which receive power from the Unit 2 inverters. Unit 2 is in a deferred status. The licensee proposes to shift the loads from the Unit 2 inverters to the Unit 1 inverters and abandon the Unit 2 inverters in place.

The licensee stated that the proposed change will not introduce any new inter-ties between redundant Class 1E buses or create opportunities for single failures that could result in the loss of multiple redundant buses. The licensee stated that channel separation will be maintained. On the basis that these loads are required to operate Unit 1 and no significant reduction in the ability of the system to perform its safety function would be created, the staff finds this change to be in conformance with GDC 5 and therefore acceptable.

The licensee has performed a load analysis and found that the Unit 1 inverters have the capacity and capability to accommodate the additional loads from the Unit 2 inverters with sufficient margin. Currently, Unit 1 vital power board loading can be as high as approximately 13 KVA. Unit 2's vital power board loading can be as high as 2 KVA. Since the capacity of the inverters is 20 KVA, the staff finds this change acceptable on the basis of inverter capacity.

TS 3.8.7 currently requires two inverters per channel to be operable. This requirement is based on the fact that both Unit 1 and Unit 2 inverters are currently being used to supply power to the loads needed for Unit 1 operation. The proposed revision would change this requirement to

one inverter per channel. This change would allow the Unit 1 and Unit 2 120V AC vital power boards to be connected so that both boards are supplied from the Unit 1 inverters. Since only the loads on the Unit 2 vital power boards necessary for Unit 1 operation will be carried by the Unit 1 inverters, the four Unit 1 inverters in their respective four channels will satisfy the requirements of GDC 5 and 17 with respect to safety system capacity and capability. On this basis the staff finds the proposed change to WBN Unit 1 TS 3.8.7 to be acceptable.

This vital power board configuration would need modification if Unit 2 were to become operational. In a letter dated July 8, 2003, the licensee committed to add a paragraph to the Updated Final Safety Analysis Report to provide assurance that the configuration of the vital AC system is addressed should action be taken to complete Unit 2. The new paragraph will state: "In this configuration, the four Unit 2 distribution panels (vital instrument power boards) are fed by the Unit 1 inverters in support of Unit 1 operation. This configuration will require modification for operation of Unit 2, including the installation of additional inverters."

The NRC staff has reviewed the licensee's proposed TS change that would allow Unit 1 and Unit 2 vital instrument power boards to be supplied from the Unit 1 inverters. Based on its evaluation, as set forth above, the staff concludes that the system will continue to meet GDC 5, 17 and 18 after the proposed change is implemented. Therefore, the proposed TS change is acceptable.

4.0 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.

5.0 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. 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 28859). 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.

6.0 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 Contributor: Trevor Specht, NRR

Date: September 8, 2003

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WATTS BAR NUCLEAR PLANT

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