UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 24, 2009

Mr. Preston D. Swafford
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 – ISSUANCE OF AMENDMENT REGARDING THE REVISION TO TECHNICAL SPECIFICATIONS FOR INVERTERS (TAC NO. MD9714)

Dear Mr. Swafford:

The Commission has issued the enclosed Amendment No. 76 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant (WBN), Unit 1. This amendment is in response to your application dated September 18, 2008 (Agencywide Document and Access Management System Accession No. ML082670361).

This amendment revises the WBN Unit 1 Technical Specification 3.8.7, "Inverters – Operating," to require two inverters for each of the four channels.

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

Sincerely,

John G. Lamb, Senior Project Manager
Watts Bar Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosures: 1. Amendment No. 76 to NPF-90
2. Safety Evaluation

cc w/enclosures: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATTS BAR NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 76
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 September 18, 2008, 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 Facility Operating License and 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. 76 , 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. Further, Facility Operating License No. NPF-90 is hereby amended to authorize a change to the Updated Final Safety Analysis Report (UFSAR) requirement of one inverter for each of the four channels to two inverters for each of the four channels, as set forth in the license amendment application dated September 18, 2008, and evaluated in the associated safety evaluation by the Commission's Office of Nuclear Reactor Regulation dated March 24 , 2009. The licensee shall update the FSAR by adding a description of this change, as authorized by this amendment, and in accordance with 10 CFR 50.71(e).

4. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 240 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

L. Raghavan, Chief
Watts Bar Special Projects Branch
Division of operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License
And Technical Specifications

Date of Issuance: March 24, 2009

ATTACHMENT TO AMENDMENT NO.76 -

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace Page 3 of Operating License NPF-90 with the attached Page 3.

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
3.8-37	3.8-37

(4) TVA, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required, any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis, instrument calibration, or other activity associated with radioactive apparatus or components; and

(5) TVA, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect, and is subject to the additional conditions specified or incorporated below.

(1) Maximum Power Level

TVA is authorized to operate the facility at reactor core power levels not in excess of 3459 megawatts thermal.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A as revised through Amendment No. 76 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) Safety Parameter Display System (SPDS) (Section 18.2 of SER Supplements 5 and 15)

Prior to startup following the first refueling outage, TVA shall accomplish the necessary activities, provide acceptable responses, and implement all proposed corrective actions related to having the Watts Bar Unit 1 SPDS operational.

(4) Vehicle Bomb Control Program (Section 13.6.9 of SSER 20)

During the period of the exemption granted in paragraph 2.D.(3) of this license, in implementing the power ascension phase of the approved initial test program, TVA shall not exceed 50% power until the requirements of 10 CFR 73.55(c)(7) and (8) are fully implemented. TVA shall submit a letter under oath or affirmation when the requirements of 73.55(c)(7) and (8) have been fully implemented.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters-Operating

LCO 3.8.7 Two inverters in each of four channels shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION		REQUIRED ACTION		COMPLETION TIME
A.	One inverter in one channel inoperable.	A.1	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems-Operating", with any AC Vital Bus deenergized. ---------- Restore inverter to OPERABLE status.	24 hours
B.	Required Action and associated Completion Time not met.	B.1 <u>AND</u> B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 76 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 September 18, 2008 (Agencywide Document Access and Management System (ADAMS) Accession No. ML082670361), the Tennessee Valley Authority (TVA or the licensee), submitted a request for changes to the Watts Bar Nuclear Plant (WBN), Unit 1, Technical Specifications (TSs). The requested changes would revise TS 3.8.7, "Inverters – Operating," from the requirement of one inverter for each of the four channels to the requirement to have two inverters for each of the four channels. This amendment is related to the completion of construction of the 120 volt (V) alternating current (AC) vital instrument power system for WBN Unit 2.

2.0 REGULATORY EVALUATION

General Design Criterion (GDC) 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10, Part 50, of the *Code of Federal Regulations* (CFR) states, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as a result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

GDC 18, "Inspection and testing of electric power systems," states that electric power systems that are important to safety be designed to permit appropriate periodic inspection and testing.

Regulatory Guide (RG) 1.6, "Independence between Redundant Standby (Onsite) Power Sources and between their Distribution Systems," describes an acceptable degree of independence between redundant standby (onsite) power sources and distribution systems.

3.0 BACKGROUND

The purpose of the 120 V AC Vital Power System at WBN is to provide reliable source of instrument and control power for reactor protection circuits and other critical instrumentation systems and components within the plant. The system is configured to preclude the loss of any redundant essential and/or protective function due to a single failure within the system, meeting GDC 17 requirements.

The current WBN Unit 1 120 V Vital AC system has four identical power channels (designated as Channels I, II, III, and IV) with the equipment of each channel electrically and physically independent from the equipment of other channels such that a failure in one channel will not cause a failure in another channel. Each channel consists of an uninterruptible power supply (UPS), a spare UPS, and the distribution board that facilitates load grouping and provides circuit protection. Each channel has access to a normal, a standby, and a regulated transformer bypass source supply, as well as a spare inverter. In the current configuration, the four WBN Unit 2 Vital Instrument Power Boards are lightly loaded (3 kilovolt-ampere (kVA) or less) and are fed by the WBN Unit 1 inverters (rated at 20 kVA). The WBN Unit 2 Vital Instrument Power Board loads are required for Unit 1 operation.

AC power for each UPS is derived from the Class 1E Auxiliary Power System via two 480 V AC, 3-phase circuits. The Direct Current (DC) input power source is derived from the Class 1 E 125 V DC Vital Power System. The normal source to each 120 V AC Vital Instrument Power Board is from its associated UPS system.

4.0 TECHNICAL EVALUATION

The licensee stated that it will be adding four new 20 kVA UPSs in relation to construction completion of the 120 V AC Vital Instrument Power System for WBN Unit 2. The cross-connections between Unit 1 and Unit 2 120 V AC Vital Instrument Power Boards will be removed. The current spare inverters will be connected to the new Unit 2 UPS as installed spare swing inverters—one for each channel. After completion of the modification, each channel of vital power will have three UPS sources: the Unit 1 UPS, the Unit 2 UPS, and a spare swing UPS that can be substituted for either the Unit 1 or Unit 2 UPS for that channel.

The license amendment request (LAR) states that the vital inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to vital instrumentation so that the fuel, reactor coolant system, and containment design limits are not exceeded. The licensee has performed design calculations to show that the inverters have adequate capacity to support the loads required by the units. The U. S. Nuclear Regulatory Commission (NRC) staff has reviewed the 120 V AC Vital Instrument Power Board Load Data and finds the capacity of the inverters to be sufficient. The maximum load rating for each inverter is 20 kVA, while the largest load limits are 14 kVA. Furthermore, the NRC staff concludes that the availability of one inverter plus a swing inverter per unit per channel in conjunction with the existence of four independent channels complies with GDC 17 requirement of minimizing the probability of losing electric power from the remaining electric power supplies as a result of loss of power from the unit, the offsite transmission network, or the onsite power supplies. Also, the design provides sufficient independence, redundancy, and testability to perform its safety function in case of a single failure.

In the LAR, the licensee stated that the spare inverters, which are currently connected to the Unit 1 125 V vital board, will also be connected to the new Unit 2 UPS, and they will be utilized as installed swing inverters when the normal supply is out of service for maintenance or fault conditions. Furthermore, the licensee is revising the WBN Unit 1 TS 3.8.7, "Inverters – Operating," to require two inverters (unit or spare) to be operable instead of one inverter for each of the four channels. The NRC staff finds that due to these changes the licensee will maintain adequate defense-in-depth and continue to meet the requirements in GDC 17.

The inverters and the associated 120 V AC Vital Instrument Power Boards are utilized to support instrumentation that monitor critical plant parameters to aid in the detection of accidents and to support the mitigation of accidents. The swing inverters are spare components, and the NRC staff finds that the loss of one of the swing inverters would not affect the availability of the other inverters.

In the LAR, the licensee stated that the cross-connections between Unit 1 and Unit 2 120 V AC Vital Instrument Power Boards will be removed. This cross-connection has been utilized to load WBN Unit 2 Vital Instrument Power Boards from WBN Unit 1 inverters. Since Unit 2 construction is being completed, the WBN Unit 2 Vital Instrument Power Boards will be fed from Unit 2 inverters, and the cross-connection will not be needed. The NRC staff finds the removal of the cross-connection to be essential in keeping the independence between the two units. Because each Vital Instrument Power Board will be powered from one of its unit's inverters with connection to separate AC and DC power sources, the independence between the two units including the independence between redundant stand by power sources and between their distribution systems will be maintained consistent with the guidance provided in RG 1.6.

The NRC staff finds the configuration of a single battery with two UPSs per channel acceptable for Unit 1 operation only.

Based on the above evaluation, the NRC staff finds the proposed revisions to the WBN Unit 1 TSs are reasonable. The proposed changes continue to ensure the availability of the required 120 V AC power to safely shut down the reactor and to maintain the reactor in a safe condition after an anticipated operational occurrence or a postulated design-basis accident. The NRC staff finds this configuration acceptable for Unit 1 operation only. The NRC staff also concludes that with the proposed TS changes, the licensee will continue to meet the requirements of GDC 17 and 18. Therefore, the NRC staff finds the proposed changes 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. 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 73 FR 65697, dated November 4, 2008. 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: Sheila Ray
Sergiu Basturescu

Date: March 24, 2009

March 24, 2009

Mr. Preston D. Swafford
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 – ISSUANCE OF AMENDMENT REGARDING THE REVISION TO TECHNICAL SPECIFICATIONS FOR INVERTERS (TAC NO. MD9714)

Dear Mr. Swafford:

The Commission has issued the enclosed Amendment No. 76 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant (WBN), Unit 1. This amendment is in response to your application dated September 18, 2008 (Agencywide Document and Access Management System Accession No. ML082670361).

This amendment revises the WBN Unit 1 Technical Specification 3.8.7, "Inverters – Operating," to require two inverters for each of the four channels.

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/
John G. Lamb, Senior Project Manager
Watts Bar Special Projects Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosures: 1. Amendment No. 76 to NPF-90
2. Safety Evaluation

cc w/enclosures: Distribution via Listserv

DISTRIBUTION:

PUBLIC	RidsNrrPMJLamb	RidsNrrDorlDpr	RidsAcrsMailCenter
LPWB Reading File	RidsNrrLABClayton	RidsOgcRp	S. Ray, NRR
RidsRgn2MailCenter	RidsNrrDeEeeb	RidsNrrPMPMilano	RidsNrrDorlLp-Wb
S. Basturescu, NRR			

ADAMS Accession Number Amendment: ML090650018 *via memorandum

OFFICE	WBSPB/PM	WBSPB/LA	EEEB/BC	OGC – "NLO"	WBSPB/BC
NAME	JLamb	BClayton	GWilson*	DRoth	LRaghavan
DATE	03/ 17 /09	03/ 24 /09	03/16/09	03/20/09	03/ 24 /09

OFFICIAL RECORD COPY