

November 19, 2004

Mr. Karl W. Singer  
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Executive Vice President  
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6A Lookout Place  
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SUBJECT: WATTS BAR UNIT 1 - ISSUANCE OF EXIGENT TECHNICAL SPECIFICATION  
AMENDMENT CONCERNING INOPERABLE REACTOR COOLANT SYSTEM  
TEMPERATURE INDICATOR (TAC NO. MC4979)

Dear Mr. Singer:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 53 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant, Unit 1. This amendment consists of a one-time change to the Technical Specifications (TSs) in response to Tennessee Valley Authority's application dated October 29, 2004, as supplemented by a letter dated November 5, 2004. Pursuant to Title 10, *Code of Federal Regulations*, Section 50.91(a)(6), you requested that your application be processed as an exigent TS amendment.

This amendment provides a one-time change to Function 4a, "Reactor Coolant System (RCS) Hot Leg Temperature Indication," of TS Table 3.3.4-1. Specifically, this amendment allows the Loop 4 RCS hot leg temperature indicator in the Auxiliary Control Room to be inoperable for the remainder of Cycle 6, which is scheduled to end at the conclusion of the spring 2005 refueling outage.

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

Sincerely,

/RA/

Chandu P. Patel, 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. 53 to  
License No. NPF-90  
2. Safety Evaluation

cc w/encls: See next page

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATT BAR NUCLEAR PLANT UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 53  
Renewed License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
  - A. The application for amendment by Tennessee Valley Authority (the licensee) dated October 28, 2004, as supplemented by a letter dated November 5, 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 set forth in 10 CFR Chapter I;
  - 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. 53, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented immediately upon receipt.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Michael L. Marshall, Jr., Chief, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: November 19, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 53

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace the following page of the Appendix A, Technical Specifications, with the attached revised page as indicated. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

Remove Page  
3.3-48

Insert Page  
3.3-48

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 53 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-90

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT NO. 1

DOCKET NO. 50-390

1.0 INTRODUCTION

On October 21, 2004, the Tennessee Valley Authority (TVA), the licensee for Watts Bar Nuclear Plant (WBN), Unit 1 discovered that Temperature Indicator 1-TI-68-65C was inoperable. This instrument provided indication of the reactor coolant system (RCS) Loop 4 hot leg temperature. The WBN Technical Specification (TS) 3.3.4, Remote Shutdown System Action A, requires the RCS hot leg temperature indication be restored in 30 days, or the plant must be shut down in accordance with Action B of TS 3.3.4. The affected instrument is located in an area accessible only during plant shutdown due to high radiological conditions. Due to the minimal safety effect of this out-of-service instrument and an operational transient following a plant shut down, the licensee did not see the justification of shutting down the plant to commence the repairs. Therefore, pursuant to Title 10, *Code of Federal Regulations* (10 CFR) Section 50.90 and 10 CFR 50.91(a)(6), the licensee requested an Exigent TS change on October 29, 2004. The licensee supplemented its request by the letter dated November 5, 2004, which is clarifying in nature, is within the scope of the original request, and does not change the proposed no significant hazards determination. The one-time change would permit continuing operation for the remainder of the Cycle 6. The next scheduled outage is in spring 2005.

Specifically, the licensee requested that the following footnote be added to Function 4a, "RCS Hot Leg Temperature Indication" in Table 3.3.4-1 of TS 3.3.4 :

*For Function 4a, the temperature indicator for RCS hot leg 4 is not required to be operable for the remainder of Cycle 6.*

2.0 REGULATORY EVALUATION

2.1 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 34, "Residual Heat Removal"

This GDC requires a residual heat removal system with suitable redundancy be provided to accomplish its intended safety function.

WBN Unit 1 is a four-loop Westinghouse pressurized-water reactor. Each loop is equipped with instrumentation to measure the hot leg and cold leg temperatures, respectively. Each hot leg's fluid temperature is measured by three resistance temperature detectors (RTD) mounted 120°

apart at a representative point in the hot leg. The three-temperature readings are averaged and signals are then processed by a microprocessor-based system called the Eagle-21. Eagle-21 and its associated signal transmission lines/sensing elements are all part of the Reactor Protection System (RPS) to trip the reactor in the event of a temperature excursion exceeding the safe design limits. These systems have been previously reviewed by the Nuclear Regulatory Commission (NRC) (see references 1 and 2).

## 2.2 10 CFR Part 50, Appendix A, General Design Criterion GDC 19, "Control Room"

This GDC requires, in part, that a control room capable of meeting personnel protection levels set forth in the regulation be provided. From the control room actions can then be taken to operate the plant under normal conditions and maintain it safely under accident conditions.

The WBN Main Control Room (MCR) is the location from which the licensee monitors the overall plant conditions. In the event of an MCR evacuation due to an emergency (e.g, fire or smoke), plant conditions can be monitored from an alternative location, the Auxiliary Control Room (ACR). Safe shutdown has been previously reviewed by the NRC (see Sections 3.2 and 3.3 of reference 4).

## 2.3 10 CFR 50.48, "Fire Protection" and 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979"

As required by 10 CFR Part 50.48(a), each operating nuclear power must plant have a fire protection plan which satisfies Criterion 3 of Appendix A to Part 50. As stated in 10 CFR 50.48(b) nuclear power plants licensed to operate prior to January 1, 1979, are required to implement Section III.G of Appendix R. For plants licensed after January 1, 1979, the applicable requirements were incorporated into the operating license for the facility. The licensee's fire protection program has been previously reviewed by the NRC (see reference 4).

## 3.0 TECHNICAL EVALUATION

### 3.1 10 CFR Part 50, Appendix A, GDC 34, "Residual Heat Removal"

The WBN Unit 1 TS 3.3.4, "Remote Shutdown System," Action A requires the RCS hot leg temperature indication be restored in 30 days if one or more is found inoperable. Otherwise, the plant must be shut down in accordance with the timeframe prescribed in Action B of TS 3.3.4.

As stated in the October 29, 2004, letter, the hot leg temperature indicators on the four loops are not safety-related equipment. Per TVA's letter dated November 5, 2004, the licensee confirmed that the affected instrument only displayed RCS Loop 4 temperature readings in the ACR. It is not part of the RPS and does not provide input to any safety related shut down system (e.g., over-temperature ) T confidence logic (see reference 3). The licensee further stated that the only component adversely impacted by the inoperable Loop 4 hot leg temperature indicator was the corresponding strip chart recorder.

Additionally, during a shutdown where the Residual Heat Removal system is activated to remove decay heat from the reactor, the plant operator could choose one of the remaining three loops (Loops 1 through 3) to achieve the intended goal. Therefore, the out-of-service temperature indicator has no impact on the safe operation and shutdown of the reactor.

### 3.2 10 CFR Part 50, Appendix A, GDC 19, "Control Room"

The overall operating conditions can be monitored from the MCR without this out-of-service temperature indicator. In the event of an MCR evacuation (e.g., fire/smoke in the MCR), the plant conditions during a safe shutdown mode can be inferred from other indicators (e.g., steam generator level/pressure/saturated temperature, etc.), which are observable from the ACR. Unlike the RCS Loop 4 hot leg temperature indication, these other indicators are located in areas where repairs can readily be made should they become inoperable. In addition, as stated in the licensee's October 29, 2004, letter, sufficient redundancy exists to provide indications in the ACR to carry out the safe shutdown without the inoperable temperature indication. Hence, the absence of RCS Loop 4 hot leg temperature indication in the ACR will not interfere with safe shutdown of the plant.

### 3.3 10 CFR 50.48, "Fire Protection" and 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979"

WBN Unit 1 was granted its operating license on February 7, 1996. Therefore, its ability to meet 10 CFR Appendix R requirements (e.g., III.G Fire Protection of Safe Shutdown Capability) has been incorporated into the operating license. As concluded in Section 7 of reference 4, NRC found the licensee's fire protection program to be acceptable. The inoperable temperature indicator has no impact on the licensee's fire protection program.

Finally, to ensure operating personnel are fully cognizant of the out-of-service instrument, the licensee indicated that it plans to take the following actions, per TVA's letter dated November 05, 2004, during the time the subject instrument is out of service:

1. All operating procedures impacted by the inoperable instrument will be revised in accordance with the licensee's established practice,
2. The inoperable instrument will be appropriately tagged,
3. The inoperable instrument will be incorporated into the re-qualification training and the required reading (i.e., Night Orders) for licensed operators, and
4. The inoperable instrument will be tracked by the "Limiting Condition for Operation Tracking" process.

### 4.0 STATEMENT OF EXIGENT CIRCUMSTANCES

The Commission's regulation, as stated in 10 CFR 50.91, provides special exceptions for the issuance of amendments when the usual 30-day public notice cannot be met. One type of special exception is an exigency. An exigency exists when the staff and the licensee need to act quickly and time does not permit the staff to publish a *Federal Register* notice allowing 30 days for prior public comment, and the staff also determines that the amendment involves no significant hazards consideration. In accordance with 10 CFR 50.91(a)(6)(i)(A), the staff issued a *Federal Register* notice providing an opportunity for hearing and allowing at least 2 weeks from the date of the notice for prior public comment on November 5, 2004 (69 FR 64596). No comments were received.

In its submittal, the licensee discussed the need for an exigent review of the proposed license amendment. This request was submitted on an exigent basis as a result of the unanticipated failure of temperature indicator (TI) 1-TI-68-65C that provides indication in the ACR for the hot



leg temperature of RCS Loop 4. Upon discovery of this condition, TVA entered Action A of TS 3.3.4. The 30-day allowed outage time for Action A of TS 3.3.4 will expire on November 20, 2004, at approximately 2:27 p.m. EST. Based on the actions taken, the problem most likely exists in the instrumentation (transmitter or thermocouple) located within the Reactor Building's Polar Crane Wall. While the plant is operating, the radiological conditions in this area prohibit access by plant personnel. Therefore, the repairs can not be safely implemented until the unit is shut down. If the proposed amendment is not granted, TS 3.3.4 would require that the plant be shut down by November 20, 2004, as repairs to the Loop 4 temperature indicator cannot be made while operating. The shutdown of the plant would result in an unnecessary operational transient since the indication parameters that remain available in the ACR are adequate to safely shut down the plant should an emergency arise.

On the basis of the above discussion, the NRC staff has determined that exigent circumstances exist and that the licensee used its best efforts to make a timely application and did not cause the exigent situation.

## 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 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the amendment, would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue. The NRC staff's analysis is set forth below.

The proposed amendment provides a one-time change to Function 4a, "Reactor Coolant System (RCS) Hot Leg Temperature Indication," of TS Table 3.3.4-1. Specifically, this amendment allows the loop 4 RCS hot leg temperature indicator in the ACR to be inoperable for the remainder of Cycle 6, which is scheduled to end at the conclusion of the spring 2005 refueling outage

(1) The proposed change does not significantly increase the probability or consequences of an accident previously evaluated because:

- The inoperability of the one T(hot) indicator does not change the probability of occurrence for these events since it is not an accident initiator. The T(hot) indicators on the four loops are non-safety related equipment.
- During safe shutdown for a MCR evacuation event, design basis flood or fire related event, no fuel damage is postulated to occur, nor is the integrity of the reactor coolant pressure boundary or containment barriers postulated to be lost. Sufficient redundancy exists with the operational instrumentation to ensure that decay heat removal functions are not adversely impacted by this change.

(2) The proposed change does not create the possibility of a new or different kind of accident from any previously evaluated because it does not alter the function of the Remote Shutdown System which is to achieve and maintain safe reactor shutdown from outside the MCR. The TS instrumentation and controls required will be such that sufficient capability is retained for decay heat removal via the steam generators to provide the indication required for safe shutdown capabilities. The change will not result in the installation of any new equipment or system. The T(hot) instrument is used for indication only and has no automatic control functions. No new operations procedures will be created by this change. Appropriate operational procedures will be updated to clarify that the Loop 4 T(hot) indication in the ACR is not available during the remainder of Cycle 6. No new operating conditions or modes will be created by this proposed change.

(3) The proposed change does not involve a significant reduction in a margin of safety as the radiological dose consequences are not impacted since this change is only applicable to the following conditions:

1. fire or smoke in the MCR,
2. an evacuation of the MCR due to some other (non-fire) unspecified reason, and
3. the design basis flood.

During safe shutdown for an MCR evacuation event, design basis flood or fire related event, no fuel damage is postulated to occur, nor is the integrity of the reactor coolant pressure boundary or containment barriers postulated to be lost. Sufficient redundancy exists with the operational instrumentation to ensure that decay heat removal functions are not adversely impacted by this change.

Based on the above considerations, the NRC staff concludes that the amendment meets the three criteria of 10 CFR 50.92. Therefore, the staff has made a final determination that the proposed amendment does not involve a significant hazards consideration.

## 7.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the 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 amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (69 FR 64596). Accordingly, these amendments meet 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 amendments.

## 8.0 CONCLUSION

On the basis of its review, the staff concluded that the licensee's request for the Exigent TS change meets the requirements of 10 CFR Part 50 Appendices A and R in that the intent of the associated requirements is met in spite of the out-of-service instrument. From the standpoint of the ALARA (As Low As Reasonably Achievable) principle in 10 CFR Part 20 and the risk-benefit consideration, the Commission has no objection to the licensee's proposed action of deferring instrument repair until the end of Cycle 6.

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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 9.0 REFERENCES

1. U. S. Nuclear Regulatory Commission, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 1 and 2," and Section 7.4 "Systems Required for Safe Shutdown," of NUREG-0847, Supplement No. 7, September 1991.
2. U. S. Nuclear Regulatory Commission, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 1 and 2," and Section 4.4.3.4 "Reactor Coolant System Temperature Measurement," of NUREG-0847, Supplement No. 8, January 1992.
3. Tennessee Valley Authority Watts Bar Nuclear Plant Unit 1 Final Safety Analysis Volume 7, Section 7.4 "Systems Required for Safe Shutdown," Table 7.2-1.
4. U. S. Nuclear Regulatory Commission, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 1 and 2," Appendix FF "Safety Evaluation Watts Bar Nuclear Plant Fire Protection Plan," NUREG-0847, Supplement No. 18, October 1995.

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Date: November 19, 2004

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**WATTS BAR NUCLEAR PLANT**

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