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

December 13, 2005

WBN-TS-05-06

10 CFR 50.90

U.S. Nuclear Regulatory Commission
Mail Stop: OFWN P1-35
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

In the Matter of) Docket No(s). 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - PROPOSED LICENSE AMENDMENT REQUEST CHANGE NO. WBN-TS-05-06 TO CHANGE THE STEAM GENERATOR SECONDARY SIDE WATER LEVEL TO GREATER THAN OR EQUAL TO 32% OF NARROW RANGE

Pursuant to 10 CFR 50.90, TVA is submitting a request for a Technical Specification change (WBN-TS-05-06) to License NPF-90. The proposed TS change will change the SG level requirement for Limiting Condition for Operation (LCO) 3.4.7.b and Surveillance Requirements (SRs) 3.4.5.2, 3.4.6.3 and 3.4.7.2 from greater than or equal to (≥) 6 percent (%) to ≥ 32% following replacement of the SGs during the Unit 1 Cycle 7 refueling outage. The Cycle 7 refueling outage is currently scheduled to begin in the Fall of 2006.

Enclosure 1 to this letter provides the description and evaluation of the proposed TS change. This includes TVA's determination that the proposed change does not involve a significant hazards consideration, and is exempt from environmental review. Enclosure 2 contains a copy of the appropriate TS pages, marked-up to show the proposed change. Enclosure 3 forwards the revised TS pages, which incorporate the proposed change. Enclosure 4 provides for information only, the TS Bases changes associated with this requested TS change.

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TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Tennessee State Department of Public Health.

TVA requests approval of the TS change before September 1, 2006 to support startup following the Cycle 7 Refueling Outage, during which replacement SGs will be installed and that the implementation of the revised TS prior to entering Mode 5 upon restart from the refueling outage. TVA is prepared to meet with the Staff if necessary to facilitate the NRC's review.

There are no regulatory commitments associated with this submittal. If you have any questions about this TS change, please contact me at (423) 365-1824.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 13th day of December 2005.

Sincerely,

P. L. Pace
Manager, Licensing
and Industry Affairs

Enclosures
1. TVA Evaluation of Proposed Change
2. Proposed Technical Specification Changes (mark-up)
3. Proposed Technical Specification Changes (re-typed)
4. Changes to Technical Specifications Bases pages

cc: See page 3

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Enclosures
cc (Enclosures):
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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
DOCKET NO. 50-390

DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-90 for WBN Unit 1.

The proposed change would revise the WBN Unit 1 Operating License to change the Steam Generator (SG) level requirement for Limiting Condition for Operation (LCO) 3.4.7.b and Surveillance Requirements (SRs) 3.4.5.2, 3.4.6.3 and 3.4.7.2 from greater than or equal to (≥) 6 percent (%) to ≥ 32% following replacement of the SGs.

TVA is requesting approval of this amendment by September 1, 2006, to support startup following completion of SG replacement activities during the Unit 1 Cycle 7 (U1C7) Refueling Outage.

2.0 PROPOSED CHANGE

Technical Specifications

The proposed amendment would revise the WBN Unit 1 Technical Specification (TS) 3.4.5, *RCS Loops - MODE 3*, TS 3.4.6, *RCS Loops - MODE 4*, and TS 3.4.7, *RCS Loops - MODE 5, Loops Filled*, to change the SG level requirement for LCO 3.4.7.b and SRs 3.4.5.2, 3.4.6.3, and 3.4.7.2 from ≥6% to ≥32% following replacement of the SGs.

In addition, symbols (i.e., ≥, <, etc.) on affected pages are being spelled out as an administrative change. Revision bars are not shown for these changes.

The TS changes affect the following sections and are illustrated by marked-up and revised pages provided in Enclosures 2 and 3:

Section 3.4.5, RCS Loops-MODE 3 - Revise SR 3.4.5.2 to read: *"Verify steam generator secondary side water levels are greater than or equal to 32% narrow range for required RCS loops."*

Section 3.4.6, RCS Loops-MODE 4 - Revise SR 3.4.6.3 to read: *"Verify SG secondary side water levels are greater than or equal to 32% narrow range for required RCS loops."*

Section 3.4.7, RCS Loops-MODE 5, Loops Filled - Revise LCO 3.4.7.b to read: *"The secondary side water level of at least two steam generators (SGs) shall be greater than or equal to 32% narrow range."*

Section 3.4.7 - Revise SR 3.4.7.2 to read: *"Verify SG secondary side water level is greater than or equal to 32% narrow range for required SGs."*

In summary, the above changes revise the value of the secondary side narrow range water level from 6% for the existing SGs to 32% for the Replacement Steam Generators (RSGs). This change will assure that the secondary side water level in the RSGs is high enough to cover the tubes.

Technical Specification Bases

Corresponding TS Bases changes are also provided for information only. Symbols (i.e., ≥, <, etc.) on affected pages are also being spelled out as an administrative change. The TS Bases changes affect the following sections and are illustrated by marked-up pages provided in Enclosure 4:

Bases Section B 3.4.5 - Revise Bases for SR 3.4.5.2 to read: *"... SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is greater than or equal to 32% (value accounts for instrument error, Ref. 1) for required RCS loops. If the SG secondary side narrow range water level is less than 32%, the tubes may ..."*

Bases Section B 3.4.6 - Revise Bases for SR 3.4.6.3 to read: *"... SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is greater than or equal to 32% (value accounts for instrument error, Ref. 1). If the SG secondary side narrow range water level is less than 32%, the tubes may ..."*

Bases Section B 3.4.7 - Revise last paragraph of BACKGROUND section of Bases to read: *"... The second path can be another OPERABLE RHR loop or maintaining two SGs with secondary side water levels above 32% narrow range to provide an alternate method for decay heat removal."*

Bases Section B 3.4.7 - Revise first paragraph of LCO section of Bases to read: *"The purpose of this LCO is to require that at least one of the RHR loops be OPERABLE and in operation with an additional RHR loop OPERABLE or two SGs with secondary side water level greater than or equal to 32% narrow range. ... However, if the standby RHR loop is not OPERABLE, an acceptable alternative is two SGs with their secondary side water levels greater than or equal to 32% narrow range. Should the operating RHR loop fail, the SGs could be used to remove decay heat."*

Bases Section B 3.4.7 - Revise first paragraph of APPLICABILITY section of Bases to read: "… *However, one additional RHR loop is required to be OPERABLE, or the secondary side water level of at least two SGs is required to be greater than or equal to 32% narrow range.*"

Bases Section B 3.4.7 - Revise ACTIONS A.1 and A.2 section of Bases to read: "*If one RHR loop is inoperable and the required SGs have secondary side water levels less than 32% narrow range redundancy for heat removal is lost. …*"

Bases Section B 3.4.7 - Revise Bases for SR 3.4.7.2 to read: "*Verifying that at least two SGs are OPERABLE by ensuring their secondary side narrow range water levels are greater than or equal to 32% (value accounts for instrument error, Ref. 1) narrow range ensures an alternate decay heat removal method in the event that …*"

Bases Section B 3.4.7 - Revise Bases for SR 3.4.7.3 to read: "… *If secondary side water level is greater than or equal to 32% narrow range in at least two SGs, this Surveillance is not needed.…*"

3.0 BACKGROUND

The existing WBN Unit 1 Westinghouse Model D3 SGs will be replaced with Westinghouse Model 68AXP SGs during the U1C7 refueling outage. The external envelope and interfaces with existing piping and support structures for the RSGs are basically the same as for the Old (existing) Steam Generators (OSGs) except that the elevation of several RSG flow and level instrument taps (upper taps and lower narrow range taps) will increase by approximately five feet. The span between the upper taps and lower narrow range taps will remain approximately the same. Internally the RSGs differ from the OSGs in several ways, including increased tube surface area, different tube material, different tube supports, and longer tube length. The tube length increases from just below the lower narrow range taps in the OSGs to more than four feet above the lower narrow range taps in the RSGs.

To support use of the RSGs, numerous analyses and evaluations have been performed to determine the impact of the RSG differences. A calculation performed by Westinghouse to determine the RSG narrow range level instrument uncertainties for Emergency Operating Procedure (EOP) setpoint applications identified the need to revise the TSs to increase the required percentage of SG narrow range level from 6% to 32% to ensure that the top of the tubes are covered. This change accounts for the change in relative location of the top of the tubes versus the lower narrow range taps and the narrow range water level instrument uncertainty.

The function of the SGs is to transfer heat produced by the fission process in the reactor core to the secondary side of the plant. To assure that the SGs are able to perform this function, the water level on the secondary side of the SG is to be maintained above the tops of SG tubes whenever the SG is required to be operable.

The Updated Final Safety Analysis Report (UFSAR) Section 7.2.2.3.5, *Steam Generator Water Level*, indicates that the basic function of the reactor protection circuits associated with the low SG water level is to preserve the SG heat sink for removal of long term residual heat. A low-low SG water level reactor trip is provided for each SG to ensure that sufficient thermal capacity is available in the SG at the start of a transient.

4.0 TECHNICAL ANALYSIS

TS 3.4.5 is applicable to MODE 3 and requires that two Reactor Coolant System (RCS) loops be OPERABLE, and either:

a. Two RCS loops shall be in operation when the Rod Control System is capable of rod withdrawal; or
b. One RCS loop shall be in operation when the Rod Control System is not capable of rod withdrawal.

SR 3.4.5.2 specifies that the SG secondary side narrow range water level is ≥ 6% for required RCS loops. The Bases for the TS indicate that the SGs provide a heat sink for removal of decay heat from the reactor vessel during MODE 3. Verifying that the secondary side narrow range water level of each SG is ≥ 6% assures that the tubes will not become uncovered and the SGs will be capable of performing their decay heat removal function.

Revision to TS 3.4.5 and the associated Bases is required to support operation with the RSGs in MODE 3. The proposed change to TS 3.4.5 is discussed in Section 2 of this Enclosure.

TS 3.4.6 is applicable to MODE 4 and requires that two loops be OPERABLE, and consist of either:

a. Any combination of RCS loops and Residual Heat Removal (RHR) loops, and one loop shall be in operation when the Rod Control System is not capable of rod withdrawal; or
b. Two RCS loops, and both loops shall be in operation when the Rod Control System is capable of rod withdrawal.

SR 3.4.6.3 specifies that the SG secondary side narrow range water level is ≥ 6% for required RCS loops. The Bases for the TS indicate that the SGs provide a heat sink

for removal of decay heat from the reactor vessel during MODE 4. Verifying that the secondary side narrow range water level of each SG is ≥ 6% assures that the tubes will not become uncovered and the SGs will be capable of performing their decay heat removal function.

Revision to TS 3.4.6 and the associated Bases is required to support operation with the RSGs in MODE 4. The proposed change to TS 3.4.6 is discussed in Section 2 of this Enclosure.

TS 3.4.7 is applicable to MODE 5, Loops Filled and requires that one RHR loop be OPERABLE and in operation, and either:

a. One additional RHR loop shall be OPERABLE; or
b. The secondary side water level of at least two Steam Generators (SGs) shall be ≥ 6% narrow range.

SR 3.4.7.2 specifies that the SG secondary side narrow range water level is ≥ 6% in required SGs. The Bases for the TS indicate that the SGs provide a backup to the RHR System for decay heat removal during MODE 5 with the RCS loops filled. Verifying that the secondary side narrow range water level of at least two SGs is ≥ 6% ensures that an alternate decay heat removal method is available if the second RHR loop is not OPERABLE.

Revision to TS 3.4.7 and the associated Bases is required to support operation with the RSGs in MODE 5, Loops Filled. The proposed change to TS 3.4.7 is discussed in Section 2 of this Enclosure.

The technical basis for the changes to TSs 3.4.5, 3.4.6, and 3.4.7 is summarized below:

In MODE 3, the primary function of the reactor coolant is removal of decay heat and transfer of this heat, via the SGs, to the secondary plant fluid. Whenever the Reactor Trip Breakers (RTBs) are in the closed position and the Control Rod Drive Mechanisms (CRDMs) are energized, an inadvertent rod withdrawal from subcritical, resulting in a power excursion, is possible. Such a transient could be caused by a malfunction of the Rod Control System. In addition, the possibility of a power excursion due to the ejection of an inserted control rod is possible with the breakers closed or open. Such a transient could be caused by the mechanical failure of a CRDM.

Therefore, in MODE 3 with RTBs in the closed position and Rod Control System capable of rod withdrawal, accidental control rod withdrawal from subcritical is postulated and requires at least two RCS loops to be OPERABLE and in operation to ensure that the accident analyses limits are met. For those conditions when the Rod Control System is not capable of rod withdrawal, two RCS loops are required

to be OPERABLE, but only one RCS loop is required to be in operation to be consistent with MODE 3 accident analyses.

SR 3.4.5.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is high enough to cover the tubes. If the SG secondary side narrow range water level is too low, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink necessary for removal of decay heat.

In MODE 4, the primary function of the reactor coolant is the removal of decay heat and the transfer of this heat to either the SG secondary side coolant or the component cooling water via the RHR heat exchangers.

With the RTBs open and the rods not capable of withdrawal, RCS circulation is considered in the determination of the time available for mitigation of the accidental boron dilution event. The RCS and RHR loops provide this circulation. Whenever the RTBs are in the closed position and the CRDMs are energized, an inadvertent rod withdrawal from subcritical, resulting in a power excursion, is possible. Such a transient could be caused by a malfunction of the Rod Control System. In addition, the possibility of a power excursion due to the ejection of an inserted control rod is possible with the breakers closed or open. Such a transient could be caused by the mechanical failure of a CRDM.

Therefore, in MODE 4 with the RTBs in the closed position and Rod Control System capable of rod withdrawal, at least two RCS loops are required to be OPERABLE and in operation to ensure that the accident analyses limits are met. For those conditions when the Rod Control System is not capable of rod withdrawal, any combination of two RCS or RHR loops are required to be OPERABLE, but only one loop is required to be in operation to meet decay heat removal requirements.

SR 3.4.6.3 requires verification of SG secondary side water level. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is high enough to cover the tubes. If the SG secondary side narrow range water level is too low, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink necessary for removal of decay heat.

In MODE 5, with the RCS loops filled, the primary function of the reactor coolant is the removal of decay heat and the transfer of this heat either to the SG secondary side coolant or the component cooling water via the RHR heat exchangers. While the principal means for decay heat removal is via the RHR system, the SGs are specified as a backup means for redundancy. Even though the SGs cannot produce steam in this mode, the generators are capable of

being a heat sink due to their large contained volume of secondary water. As long as the SG secondary side water is at a lower temperature than the reactor coolant, heat transfer will occur. The rate of heat transfer is directly proportional to the temperature difference.

During MODE 5, RCS circulation is considered in the determination of the time available for mitigation of the accidental boron dilution event. The RHR loops provide this circulation.

The purpose of SR 3.4.7.2 is to require that at least one SG be OPERABLE with secondary side narrow range water level indication high enough to cover the tubes. Therefore, the acceptance criterion is to provide an indicated level that will ensure the tubes are covered.

Since the TSs described above addresses SG narrow range level requirements during MODE 3, 4 and 5, a calculation was performed to determine the secondary side narrow range water level needed to cover the tubes for the RSGs during MODE 3, 4, and 5.

Liquid level measurements of closed vessels based on differential pressure are subject to errors due to density changes in the vessel contents or the reference leg. These errors are caused by 1) pressure and temperature changes in the vessel resulting in a change in the differential pressure across the vessel or 2) a temperature change in the environment around the reference leg. These errors, applicable to the SG narrow range water level function have been calculated as described below.

To quantify the effects of process pressure variations, the uncertainty as a percentage of the RSG narrow range level span was evaluated for different MODE 4 and 5 secondary side temperature conditions. The evaluation showed that as the temperature increases the magnitude of the uncertainty decreases. The maximum process pressure uncertainty determined was for MODE 5 at atmospheric pressure and subcooled conditions. Therefore, since the uncertainty decreases as temperature increases, the uncertainties associated with the higher temperatures during MODE 3 and MODE 4 operation are bounded by the MODE 5 uncertainty.

To quantify the effects of reference leg temperature variations due to changes in containment building environmental conditions during normal operations in MODE 4 and 5, the uncertainty as a percentage of RSG narrow range level span was evaluated. The maximum reference leg uncertainty determined was for the upper bound containment temperature.

The RSG narrow range level channel uncertainty was determined by combining the uncertainty associated with the

various instrumentation components (e.g., sensor drift, sensor temperature, indicator drift, indicator calibration accuracy, etc.) using the Square Root of the Sum of the Squares (SRSS) methodology identified in Reference 1. The methodology combines the uncertainty components for a narrow range level channel in an appropriate combination of those groups which are statistically and functionally independent. Those uncertainties that are not independent are conservatively treated by arithmetic summation, and then systematically combined with the independent terms.

The minimum required RSG narrow range level (without the above uncertainties) as a percentage of span was determined by subtracting the height of the lower level tap above the tube sheet from the height of the highest tube in the RSG above the tube sheet and dividing that result by the distance between the upper and lower level taps.

To determine the minimum required narrow range level for the RSGs (including instrument uncertainties), the process pressure uncertainty, reference leg temperature uncertainty, and narrow range level channel uncertainty, were added to the minimum narrow range level without uncertainties. The result was rounded to 32 percent to define an easily readable value on the indicator and add some additional conservatism.

5. REGULATORY SAFETY ANALYSIS

TVA is submitting a request for an amendment to the Watts Bar Nuclear Plant (WBN) Unit 1 Operating License NPF-90 and Technical Specifications (TSs). The proposed amendment would modify TS 3.4.5, *RCS Loops - MODE 3*, TS 3.4.6, *RCS Loops - MODE 4*, and TS 3.4.7, *RCS Loops - MODE 5, Loops Filled*, to change the Steam Generator (SG) level requirement for Limiting Condition for Operation (LCO) 3.4.7.b and Surveillance Requirements (SRs) 3.4.5.2, 3.4.6.3 and 3.4.7.2 from $\geq$ 6% to $\geq$ 32% following replacement of the Old (existing) Steam Generators (OSGs) with Replacement (new) Steam Generators (RSGs) during the Unit 1 Cycle 7 (U1C7) refueling outage. Corresponding TS Bases changes are also proposed.

5.1 No Significant Hazards Consideration

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The accidents and transients of interest are those that may occur in MODE 3, 4 or 5 and that rely upon one or two of the SGs to be OPERABLE to provide a heat sink for the removal of decay heat from the reactor vessel. These events include an accidental control rod withdrawal from subcritical, ejection of a control rod, and accidental boron dilution. TS SRs provide verification of SG water level which demonstrates that the SG is OPERABLE and able to act as a heat sink.

The proposed revision to TSs 3.4.5, 3.4.6, and 3.4.7 reflects the change to the required minimum SG water level necessary to demonstrate OPERABILITY of the RSGs. Therefore, since no initiating event mechanisms or OPERABILITY requirements are being changed, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

Operation in MODE 3, 4 or 5 with a SG water level of less than 32% of span is not an initiator of any of the accidents and transients described in the UFSAR. This situation puts the plant into a LCO situation and requires that the plant initiate actions within a specified timeframe if SG OPERABILITY cannot be restored within the specified timeframe. The change in the value of the SG water level reflects the differences between the OSGs and the RSGs. The new value will be used in the same manner as the old one to assess the OPERABILITY of the SGs.

Therefore, operation in MODE 3, 4 or 5 with a SG water level of less than 32% of span will not initiate an accident nor create any new failure mechanisms. The changes to the TSs do not result in any event previously deemed incredible being made credible. The change will not result in more adverse conditions and is not expected to result in any increase in the challenges to safety systems.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed changes to the affected TSs revise the value of SG narrow range water level that is needed to demonstrate that OPERABILITY of the SG to support operation with the RSGs. The change in the value of the SG water level reflects the differences between the OSGs and the RSGs. These changes assure that the required numbers of SGs are OPERABLE with secondary side narrow range water level indication high enough to cover the tubes. Therefore, the acceptance criterion is to provide an indicated level that will ensure the tubes are covered. Since the same acceptance criteria is being used for the RSGs as was used for the OSGs, there is no reduction in the margin of safety.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, TVA concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

Regulatory requirements and criteria applicable to the design bases for the SGs include NRC's 10 CFR 50 Appendix A GDCs, such as GDC-1, *Quality Standards and Records*, GDC-2, *Design Bases for Protection Against Natural Phenomena*, GDC-4, *Environmental and Missile Design Basis*, GDC-5, *Sharing of Structures, Systems, and Components*, GDC-10, *Reactor Design*, GDC-13, *Instrumentation and Control*, GDC-14, *Reactor Coolant Pressure Boundary*, GDC-15, *Reactor Coolant System Design*, GDC-20, *Protection System Functions*, GDC-25, *Protection System Requirements for Reactivity Control Malfunctions*, GDC-34, *Residual Heat Removal*, and GDC-44, *Cooling Water* and NRC's Standard Review Plan (SRP)- 5.4.7, *Residual Heat Removal (RHR) System*, 10.3, *Main Steam Supply System*, 10.4.7, *Condensate and Feedwater System*, 15.4.1, *Uncontrolled Control Rod Assembly Withdrawal from a Subcritical or Low Power Startup Condition*, 15.4.3, *Control Rod Misoperation*, 15.4.6, *Chemical and Volume Control System Malfunction that Results in a Decrease in the Boron Concentration in the Reactor Coolant*, 15.4.8, *Spectrum of Rod Ejection Accidents*,. Applicable codes, standards, and specifications to the design bases for the SGs are provided in the WBN UFSAR Section 3.2, *Classification of Structures, Systems, and Components*.

TVA evaluated the use of the RSGs against the applicable NRC regulations and criteria. The change in the TS value of the SG water level reflects the differences between the OSGs and the RSGs. These changes assure that the required numbers of SGs are OPERABLE with secondary side narrow range water level indication high enough to cover the tubes. This assures that the SGs will respond as designed. These TS changes are, therefore, considered safe and meet the applicable regulatory requirements.

In conclusion, based on the considerations discussed above, (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.

6.0. ENVIRONMENTAL IMPACT CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. WCAP-14738, "Westinghouse Revised Thermal Design Procedure Instrument Uncertainty Methodology for Tennessee Valley Authority Watts Bar Unit 1 - 1.4% Uprate to 3475 MW NSSS Power", Revision 1.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
LICENSE AMENDMENT CHANGE WBN-TS-05-06

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

I. AFFECTED PAGE LIST

3.4-10
3.4-13
3.4-14
3.4-15

II. MARKED PAGES

See attached.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.5.2	Verify steam generator secondary side water levels are ≥ greater than or equal to ~~6~~32% narrow range for required RCS loops.	12 hours
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.6.2	Verify one RHR or RCS loop is in operation when the rod control system is not capable of rod withdrawal.	12 hours
SR 3.4.6.3	Verify SG secondary side water levels are ≥ **greater than or equal to** ~~632~~% narrow range for required RCS loops.	12 hours
SR 3.4.6.4	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops - MODE 5, Loops Filled

LCO 3.4.7 One residual heat removal (RHR) loop shall be OPERABLE and in operation, and either:

a. One additional RHR loop shall be OPERABLE; or

b. The secondary side water level of at least two steam generators (SGs) shall be ≥ **greater than or equal to** 632% narrow range.

---NOTES---

1. One required RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

2. No reactor coolant pump shall be started with one or more RCS cold leg temperatures ≤ **less than or equal to** 350°F unless the secondary side water temperature of each SG is ≤ **less than or equal to** 50°F above each of the RCS cold leg temperatures.

3. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable. AND Required SGs secondary side water levels not within limits.	A.1 Initiate action to restore a second RHR loop to OPERABLE status. OR A.2 Initiate action to restore required SG secondary side water levels to within limits.	Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required RHR loops inoperable. OR No RHR loop in operation.	B.1 Suspend all operations involving a reduction of RCS boron concentration. AND B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	12 hours
SR 3.4.7.2	Verify SG secondary side water level is **≥ less than or equal to** ~~6~~ **32%** narrow range in required SGs.	12 hours
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	7 days

ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
LICENSE AMENDMENT CHANGE WBN-TS-05-06

PROPOSED TECHNICAL SPECIFICATION CHANGES (REVISED)

I. AFFECTED PAGE LIST

3.4-10
3.4-13
3.4-14
3.4-15

II. REVISED PAGES

See attached.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.5.2	Verify steam generator secondary side water levels are greater than or equal to 32% narrow range for required RCS loops.	12 hours
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.6.2	Verify one RHR or RCS loop is in operation when the rod control system is not capable of rod withdrawal.	12 hours
SR 3.4.6.3	Verify SG secondary side water levels are greater than or equal to 32% narrow range for required RCS loops.	12 hours
SR 3.4.6.4	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops - MODE 5, Loops Filled

LCO 3.4.7 One residual heat removal (RHR) loop shall be OPERABLE and in operation, and either:

a. One additional RHR loop shall be OPERABLE; or

b. The secondary side water level of at least two steam generators (SGs) shall be greater than or equal to 32% narrow range.

---NOTES---

1. One required RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

2. No reactor coolant pump shall be started with one or more RCS cold leg temperatures less than or equal to 350°F unless the secondary side water temperature of each SG is less than or equal to 50°F above each of the RCS cold leg temperatures.

3. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable. AND Required SGs secondary side water levels not within limits.	A.1 Initiate action to restore a second RHR loop to OPERABLE status. OR A.2 Initiate action to restore required SG secondary side water levels to within limits.	Immediately Immediately

(continued)

ENCLOSURE 4

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
LICENSE AMENDMENT CHANGE WBN-TS-05-06

PROPOSED TECHNICAL SPECIFICATION BASES CHANGES

I. AFFECTED PAGE LIST

B 3.4-25
B 3.4-32
B 3.4-33
B 3.4-34
B 3.4-35
B 3.4-36

II. ANNOTATED PAGES

See attached.

BASES

ACTIONS (continued)

D.1, D.2, and D.3

If all RCS loops are inoperable or no RCS loop is in operation, except as during conditions permitted by the Note in the LCO section, all CRDMs must be de-energized by opening the RTBs or de-energizing the MG sets. All operations involving a reduction of RCS boron concentration must be suspended, and action to restore one of the RCS loops to OPERABLE status and operation must be initiated. Boron dilution requires forced circulation for proper mixing, and opening the RTBs or de-energizing the MG sets removes the possibility of an inadvertent rod withdrawal. The immediate Completion Time reflects the importance of maintaining operation for heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

This SR requires verification every 12 hours that the required loops are in operation. Verification includes flow rate, temperature, and pump status monitoring, which help ensure that forced flow is providing heat removal. The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RCS loop performance.

SR 3.4.5.2

SR 3.4.5.2 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is greater than or equal to ~~6~~32% (value ~~does not~~ accounts for instrument error, Ref. 1) for required RCS loops. If the SG secondary side narrow range water level is less than ~~6~~32%, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink for removal of the decay heat. The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to a loss of SG level.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.6.3

SR 3.4.6.3 requires verification of SG OPERABILITY. SG OPERABILITY is verified by ensuring that the secondary side narrow range water level is greater than or equal to ~~6~~32% (value ~~does not~~ accounts for instrument error, Ref. 1). If the SG secondary side narrow range water level is less than ~~6~~32%, the tubes may become uncovered and the associated loop may not be capable of providing the heat sink necessary for removal of decay heat. The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.

SR 3.4.6.4

Verification that the required pump is OPERABLE ensures that an additional RCS or RHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.

REFERENCES

1. Watts Bar Drawing 1-47W605-242, "Electrical Tech Spec Compliance Tables."

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.7 RCS Loops - MODE 5, Loops Filled

BASES

BACKGROUND

In MODE 5 with the RCS loops filled, the primary function of the reactor coolant is the removal of decay heat and transfer this heat to either the steam generator (SG) secondary side coolant or the component cooling water via the residual heat removal (RHR) heat exchangers. While the principal means for decay heat removal is via the RHR System, the SGs are specified as a backup means for redundancy. Even though the SGs cannot produce steam in this MODE, they are capable of being a heat sink due to their large contained volume of secondary water. As long as the SG secondary side water is at a lower temperature than the reactor coolant, heat transfer will occur. The rate of heat transfer is directly proportional to the temperature difference. The secondary function of the reactor coolant is to act as a carrier for soluble neutron poison, boric acid.

In MODE 5 with RCS loops filled, the reactor coolant is circulated by means of two RHR loops connected to the RCS, each loop containing an RHR heat exchanger, an RHR pump, and appropriate flow and temperature instrumentation for control, protection, and indication. One RHR pump circulates the water through the RCS at a sufficient rate to prevent boric acid stratification.

The number of loops in operation can vary to suit the operational needs. The intent of this LCO is to provide forced flow from at least one RHR loop for decay heat removal and transport. The flow provided by one RHR loop is adequate for decay heat removal. The other intent of this LCO is to require that a second path be available to provide redundancy for heat removal.

The LCO provides for redundant paths of decay heat removal capability. The first path can be an RHR loop that must be OPERABLE and in operation. The second path can be another OPERABLE RHR loop or maintaining two SGs with secondary side water levels above ~~6~~32% narrow range to provide an alternate method for decay heat removal.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

In MODE 5, RCS circulation is considered in the determination of the time available for mitigation of the accidental boron dilution event. The RHR loops provide this circulation.

RCS Loops - MODE 5 (Loops Filled) have been identified in the NRC Policy Statement as important contributors to risk reduction.

LCO

The purpose of this LCO is to require that at least one of the RHR loops be OPERABLE and in operation with an additional RHR loop OPERABLE or two SGs with secondary side water level greater than or equal to ~~6~~32% narrow range. One RHR loop provides sufficient forced circulation to perform the safety functions of the reactor coolant under these conditions. An additional RHR loop is required to be OPERABLE to meet single failure considerations. However, if the standby RHR loop is not OPERABLE, an acceptable alternate method is two SGs with their secondary side water levels greater than or equal to ~~6~~32% narrow range. Should the operating RHR loop fail, the SGs could be used to remove the decay heat.

Note 1 allows one RHR loop to be inoperable for a period of up to 2 hours, provided that the other RHR loop is OPERABLE and in operation. This permits periodic surveillance tests to be performed on the inoperable loop during the only time when such testing is safe and possible.

Note 2 requires that the secondary side water temperature of each SG be less than or equal to 50°F above each of the RCS cold leg temperatures before the start of a reactor coolant pump (RCP) with an RCS cold leg temperature less than or equal to 350°F. This restriction is to prevent a low temperature overpressure event due to a thermal transient when an RCP is started.

Note 3 provides for an orderly transition from MODE 5 to MODE 4 during a planned heatup by permitting removal of RHR loops from operation when at least one RCS loop is in operation. This Note provides for the transition to MODE 4 where an RCS loop is permitted to be in operation and replaces the RCS circulation function provided by the RHR loops.

(continued)

BASES

LCO (continued)

RHR pumps are OPERABLE if they are capable of being powered and are able to provide flow if required. An OPERABLE SG can perform as a heat sink when it has an adequate water level and is OPERABLE in accordance with the Steam Generator Tube Surveillance Program.

APPLICABILITY

In MODE 5 with RCS loops filled, this LCO requires forced circulation of the reactor coolant to remove decay heat from the core and to provide proper boron mixing. One loop of RHR provides sufficient circulation for these purposes. However, one additional RHR loop is required to be OPERABLE, or the secondary side water level of at least two SGs is required to be greater than or equal to ~~6~~32% narrow range.

Operation in other MODES is covered by:

LCO 3.4.4, "RCS Loops - MODES 1 and 2";
LCO 3.4.5, "RCS Loops - MODE 3";
LCO 3.4.6, "RCS Loops - MODE 4";
LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled";
LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level" (MODE 6); and
LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level" (MODE 6).

ACTIONS

A.1 and A.2

If one RHR loop is inoperable and the required SGs have secondary side water levels less than ~~6~~32% narrow range redundancy for heat removal is lost. Action must be initiated immediately to restore a second RHR loop to OPERABLE status or to restore the required SG secondary side water levels. Either Required Action A.1 or Required Action A.2 will restore redundant heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no RHR loop is in operation, except during conditions permitted by Note 1, or if no loop is OPERABLE, all

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

operations involving a reduction of RCS boron concentration must be suspended and action to restore one RHR loop to OPERABLE status and operation must be initiated. To prevent boron dilution, forced circulation is required to provide proper mixing and preserve the margin to criticality in this type of operation. The immediate Completion Times reflect the importance of maintaining operation for heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires verification every 12 hours that the required loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RHR loop performance.

SR 3.4.7.2

Verifying that at least two SGs are OPERABLE by ensuring their secondary side narrow range water levels are greater than or equal to ~~6~~32% (value ~~does not~~ accounts for instrument error, Ref. 1) narrow range ensures an alternate decay heat removal method in the event that the second RHR loop is not OPERABLE. If both RHR loops are OPERABLE, this Surveillance is not needed. The 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to the loss of SG level.

SR 3.4.7.3

Verification that a second RHR pump is OPERABLE ensures that an additional pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the RHR pump. If secondary side water level is greater than or equal to ~~6~~32% narrow range in at least two SGs,

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required RHR loops inoperable. OR No RHR loop in operation.	B.1 Suspend all operations involving a reduction of RCS boron concentration. AND B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	12 hours
SR 3.4.7.2	Verify SG secondary side water level is ≥ greater than or equal to ~~6~~ 32% narrow range in required SGs.	12 hours
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	7 days