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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 2
NRC Docket No. 50-391

Subject: Watts Bar Nuclear Plant, Unit 2 – Response to Request for Additional Information Regarding Technical Specifications Changes – Instrumentation and Controls Branch (TAC No. ME7713)

- References:
1. NRC letter to TVA dated March 13, 2013, "Watts Bar Nuclear Plant, Unit 2 - Request for Additional Information Regarding Technical Specifications Changes – Instrumentation and Controls Branch (TAC No. ME7713)" [ML13037A265]
 2. TVA letter to NRC dated June 21, 2011, "Watts Bar Nuclear Plant (WBN) Unit 2 – Response to NRC Staff Comments on Developmental Revisions of the Unit 2 Technical Specifications (TS) and Technical Specifications Bases (TS Bases); Submittal of Developmental Revision F"
 3. TVA letter to NRC dated October 5, 2010, "Watts Bar Nuclear Plant (WBN) Unit 2 – Instrumentation and Controls Staff Information Requests"
 4. TVA letter to NRC dated May 13, 2010, "Watts Bar Nuclear Plant (WBN) Unit 2 – Transmittal of TVA EEB-TI-28, Branch Technical Instruction, 'Setpoint Calculations'"

The purpose of this letter is to respond to the NRC Request for Additional Information (RAI) related to the Technical Specifications (TS) on the Reactor Trip System and the Engineered Safety Features Actuation System provided in Reference 1. TVA's response is provided in the enclosure to this letter.

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There are no new regulatory commitments contained in this letter. The enclosed response provides information that satisfies commitments 2 and 3 of Enclosure 9 to Reference 2. If you have any questions, please contact Gordon Arent at (423) 365-2004.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 21st day of March, 2013.

Respectfully,



Raymond A. Hruby, Jr.
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Watts Bar Unit 2

Enclosure: Response to a Request for Additional Information, Watts Bar Nuclear Plant Unit 2 Regarding Technical Specifications Changes, Instrumentation and Controls Branch

cc (Enclosure):

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RESPONSE TO A REQUEST FOR ADDITIONAL INFORMATION
WATTS BAR NUCLEAR PLANT, UNIT 2 REGARDING
TECHNICAL SPECIFICATIONS CHANGES

Instrumentation and Controls Branch

GENERAL RESPONSE

WBN Unit 2 FSAR Section 7.1.2.1.9 discusses Trip Setpoints. TVA has used Technical Specification Task Force (TSTF) 493 Revision 4 for setpoints in the Reactor Trip System (RTS) and the Engineered Safeguards Features Actuation System (ESFAS). Westinghouse establishes the values for most of the associated features and the methods and values are provided in WCAP-17044-P, "Westinghouse Setpoint Methodology for Protection Systems, Watts Bar Unit 2." Setpoints developed by TVA are performed using the methodology described in TVA Technical Instruction (TI) TVA EEB TI-28. The NRC reviewed the setpoint methodology used for WBN Unit 2 in Supplemental Safety Evaluation Report (SSER) 23. The conclusions from SSER 23 are summarized in the following:

"By letter dated September 1, 2010 (ADAMS Accession No. ML1 02530216), TVA submitted WBN Unit 2 FSAR Amendment 100. In this amendment, TVA discussed in detail the setpoint methodology used by TVA and Westinghouse to calculate instrument setpoints for the RPS and the ESFAS. In response to staff questions about various aspects of the instrument setpoint methodology used by TVA and Westinghouse, TVA provided additional information by letter dated October 29, 2010 (letter open items 306 through 311; ADAMS Accession No. ML103120711). By letter dated December 17, 2010 (ADAMS Accession No. ML1 10070327), TVA incorporated the revised description of instrument setpoint methodologies used by TVA and Westinghouse into FSAR Amendment 102. TVA's description is consistent with Technical Specification Task Force (TSTF)-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS Functions," which was reviewed and accepted by the NRC staff by letter dated May 11, 2010 (ADAMS Accession No. ML100710442). TVA also stated in the FSAR that "Single-sided correction factors are not used in setpoint calculations within the scope of TSTF-493." Based on its review of WBN Unit 2 FSAR Amendment 102, the NRC staff concludes that the instrument setpoint methodology meets the guidance in RIS 2006-17 and RG 1.105."

SPECIFIC RAI RESPONSES:

NRC Question 1

Withdrawn.

NRC Question 2

In TS section 3.3.1, "RTS [Reactor Trip System] Instrumentation", Over-temperature delta-T, Surveillance Requirement SR 3.3.1.3, Note 2, the rated thermal power within 96 hours of which the surveillance is to be performed was changed from $\geq 15\%$ RTP to $\geq 25\%$ RTP.

Provide a justification for this change including where in the FSAR or the Supplemental Safety Evaluation Report (SSER) it is addressed.

Also, provide a summary of the calculation for this change and a description of the methodology used to make the calculation.

TVA Response

The value was changed from 15 percent to 25 percent because of the use of the WINCISE system described in detail in FSAR Section 7.2.1. The use of 25 percent Rated Thermal Power was approved by NRC in SSER 24. This is not an allowable or limiting value. It is a value that is selected to ensure that the surveillance is performed at an appropriate reactor power level. Typically, the reactor would be above 50 percent power when the 96 hour timeframe is reached. It is also described in the associated TS Bases section on page B3.3-54. Because this is not a calculated value, there is no methodology associated with it.

NRC Question 3

In TS section 3.3.1, "RTS Instrumentation", Functional Unit 5, "Source Range Neutron Flux"; the Allowable Value (AV) was changed from less than or equal to (\leq) $1.5 E5$ (counts per second (cps)) to $\leq 1.33 E5$ cps.

Provide a justification for this change including where in the FSAR or the SSER it is addressed.

Also, provide a summary of the calculations used for determining the AV, Nominal Trip Setpoint (NTSP), Total Loop Uncertainty, As-Found and As-Left Tolerances, as applicable, and a description of the methodology used to make the calculations

TVA Response

The change to the Source Range Neutron Monitor Allowable Value was made to calculate the value in accordance with TSTF-493. Westinghouse does not specify Analytical Limits for these instrument loops. The allowable value was calculated in Setpoint and Scaling calculation 2-NMD-92-131 based on the methodology provided in TVA EEB-TI-28. This TI was provided to the NRC in Reference 4. The general FSAR discussion of setpoint methodology is provided in FSAR Section 7.1. NRC's review of the TVA Setpoint Methodology for the RTS is contained in SSER 23. NRC concluded that the methodology meets the relevant requirements of the Standard Review Plan (SRP) and is therefore acceptable. WBN Unit 1 has not updated to TSTF-493 methods and this is the reason for the differences. The specific TS values are not discussed in the FSAR, the TS Bases, or in an SSER.

NRC Question 4

In TS section 3.3.1, "RTS Instrumentation", Functional Unit 11, "Undervoltage RCPs [Reactor Coolant Pumps]"; the AV was changed from ≥ 4734 V to ≥ 5112 V, and the NTSP changed from 4830 V to 5400 V.

Provide a justification for these changes including where in the FSAR or the SSER they are addressed.

Provide a summary of the calculations used for determining the AV, NTSP, Total Loop Uncertainty, As-Found and As-Left Tolerances, as applicable, and a description of the methodology used to make the calculations.

TVA Response

The changes to the Undervoltage Reactor Coolant Pump TS values were made to calculate the Normal Measurable Accuracies and Allowable Values in accordance with TSTF-493. The allowable value and nominal trip setpoint were calculated in Setpoint and Scaling calculation WBPE0689009007 based on the methodology provided in TVA EEB-TI-28. This TI was provided to the NRC in Reference 4. The general FSAR discussion of setpoint methodology is provided in FSAR Section 7.1. NRC's review of the TVA Setpoint Methodology for the RTS is contained in SSER 23. NRC concluded that the methodology meets the relevant requirements of the SRP and is therefore acceptable. WBN Unit 1 has not updated to TSTF-493 methods and this is the reason for the differences. These values are discussed in the TS Bases on page B 3.3-23. The specific T/S values are not discussed in either the FSAR or in an SSER.

NRC Question 5

In TS section 3.3.1, "RTS Instrumentation", Functional Unit 14.a, "Turbine Trip, Low Fluid Oil Pressure"; SR 3.3.1.18 was changed to SR 3.3.1.10.

Provide a justification for this change including where in the FSAR or the SSER it is addressed.

TVA Response

The surveillance requirement (SR) for the Turbine Trip, Low Fluid Oil Pressure was changed from 3.3.1.18 to 3.3.1.10 because 18 was a typographical error. No discussion in the FSAR or in an SSER is needed.

NRC Question 6

In TS section 3.3.1, "RTS Instrumentation", Functional unit 14.a, "Turbine Trip, Low Fluid Oil Pressure", the AV was changed from ≥ 43 psig to ≥ 38.3 psig.

Provide a justification for these changes including where in the FSAR or the SSER they are addressed.

Also, provide summary calculations used for determining the AV, NTSP, Total Loop Uncertainty, As-Found and As-Left Tolerances, as applicable, and a description of the methodology used to make the calculations.

TVA Response

The change to the Turbine Trip, Low Fluid Oil Pressure allowable value was made to calculate the value in accordance with the requirements of TSTF-493. There are no Analytical or Safety Limits. The allowable value was calculated in Setpoint and Scaling calculation 2-PS-047-0073 based on the methodology provided in TVA EEB-TI-28. This TI was provided to the NRC in Reference 4. The general FSAR discussion of setpoint methodology is provided in FSAR Section 7.1. NRC's review of the TVA Setpoint Methodology for the RTS is contained in SSER 23. NRC concluded that the methodology meets the relevant requirements of the SRP and is therefore acceptable. WBN Unit 1 has not updated to TSTF-493 methods and this is the reason for the differences. The specific TS values are not discussed in the FSAR, the TS Bases, or in an SSER.

NRC Question 7

In TS section 3.3.2, "ESFAS [Engineered Safety Feature Actuation System] Instrumentation", SR 3.3.2.5, and in TS section 3.3.6 "Containment Vent Isolation Instrumentation", surveillance requirement SR 3.3.6.5; the following note was added to the 18 month frequency:

"and Potter & Brumfield MDR [motor-driven rotary] Series relays."

The proposed changes would extend the test frequency of the Potter & Brumfield MDR Series relays to 18 months. The applicant has also proposed adding the same changes to the respective TS Bases.

The current WBN Unit 1 TS only identifies the Westinghouse Type AR relay as having a surveillance frequency of 18 months.

By letter dated December 30 1998, the NRC issued Amendment No. 17 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant, Unit 1. The amendment was in response to TVA's license amendment application dated February 28, 1996, as supplemented October 2 and December 12, 1997, March 30 and December 11, 1998. The February 28, 1996, letter proposed to extend the surveillance interval for Westinghouse type AR relays with alternating current and direct current coils from quarterly to an 18 month interval. The letter of December 11, 1998 revised the scope of the application such that it applies only to Westinghouse type AR relays which use alternating current (ac) coils.

Based on the review of WCAP-13877, Rev. 1, WCAP-13900, Rev. 0, and the licensee's submittals referencing these topical reports, the NRC staff concluded that the proposed test interval extension to 18 months for Westinghouse Type AR relays with ac coils used in ESFAS slave relays applications was justified for WBN Unit 1.

Only Westinghouse Type AR relays with ac coils are within the scope of WCAP-13877. Potter & Brumfield MDR Series relays are not within the scope WCAP-13877 (Rev. 1 or Rev. 2) and the conclusions of Amendment 17 are not applicable to Potter & Brumfield MDR relays.

TR, WCAP-13878, however, addresses the surveillance extension of Potter & Brumfield MDR relays. Licensees that use Potter and Brumfield MDR relays for ESFAS subgroup relay applications and are proposing test interval extensions based on WCAP-13878 should:

- 1. Confirm the applicability of the WCAP-13878, Rev. 1 analyses for their plant.*
- 2. Ensure that their procurement program for Potter & Brumfield MDR relays is adequate for detecting the types of failures that are discussed in References 9, 10, 11, and 12 of the SER.*
- 3. Ensure that all pre-1992 Potter & Brumfield MDR relays which are used in either normally energized or a 20 percent duty cycle, have been removed from ESFAS applications.*
- 4. Ensure that the contact loading analysis for Potter & Brumfield MDR relays has been performed to determine the acceptability of these relays.*

The NRC staff has not identified a previous NRC staff Safety Evaluation approving the surveillance extension of Potter and Brumfield MDR relays for WBN or a License Amendment Request from TVA requesting such an extension for WBN based on WCAP-13878.

Provide a justification for extending the test frequency of the Potter & Brumfield MDR Series relays to 18 months.

TVA Response

The NRC correctly notes that Unit 1 uses Westinghouse Type AR slave relays while Unit 2 uses Potter & Brumfield MDR Series relays in addition to the Type AR relays. TVA has responded on several occasions to NRC questions with respect to WBN Unit 2's use of Potter & Brumfield MDR relays. In each response, TVA has stated that the basis for an 18 month surveillance interval is WCAP-13878 R2 and NRC's acceptance of the WCAP. References 2 and 3 provided TVA's previous responses. SSER 23 identifies that Unit 2 will be using the Potter & Brumfield MDR relays and that their use is acceptable. SSER 23 was issued eight months after TVA's Reference 2 RAI response stating that the surveillance interval was based on WCAP-13878 R2. TVA also notes that TS Bases SR 3.3.2.5 was updated to show the use of Potter & Brumfield MDR relays and that the surveillance interval was based on the reliability assessment of WCAP-13878 R2. This revision of the TS Bases was submitted to the NRC on February 2, 2010.

The justification for the use of an 18 month surveillance interval is provided in the following discussion. TVA confirms that WCAP-13878, Rev. 2 is applicable to WBN Unit 2. The conditions specified in the WCAP are met as shown in the following responses.

1. Procurement of commercial parts for safety-related applications is done in accordance with TVA procedure NEDP-8, "Technical Evaluation For Procurement of Materials and Services," Revision 21. The procedure requires that the Procurement Engineering Group (PEG) include testing requirements for the procurement of commercial items to be used in

safety-related applications as part of the procurement specification. Further it recommends that such testing be done by a third party instead of TVA.

A review of the TVA stock numbers (CATIDs) for safety-related Potter & Brumfield MDR relays found the following:

- a. The only CATIDs referenced for use in the solid-state protection system (SSPS) specify Westinghouse as the supplier. The use of Westinghouse to provide these relays is one of the SER approved methods for ensuring that the types of failures that are discussed in References 9, 10, 11, and 12 of the SER are detected and such relays are not installed.
 - b. While not specified for use in SSPS, the only other CATIDs for safety-related Potter & Brumfield MDR relays require procurement from the original equipment supplier under their Appendix B program or from Southern Testing Services (an approved qualifier) using a previously approved testing program in accordance with the requirements of NEDP-8. These methods are sufficient for ensuring that the types of failures that are discussed in References 9, 10, 11, and 12 of the SER are detected and such relays are not installed in other safety-related applications at WBN.
2. No Potter & Brumfield MDR relays were supplied with the original WBN Unit 2 SSPS output cabinets. All Potter & Brumfield relays installed by Westinghouse during the 2010 SSPS refurbishment were manufactured after 1992.

The only other use of Potter & Brumfield MDR relays in SSPS is in the Safeguards Test Cabinets. These relays were replaced as part of the Westinghouse 2010 SSPS refurbishment.

WBN Unit 2 contact loading analysis and the acceptability of installing MDR relays in specific locations is documented in calculation WBNEEBIDQOO209920100002, "SSPS ESFAS Slave Relay Contact Loading - Unit 2," Revision 0. The calculation was included as part of the work order during the refurbishment of the SSPS cabinets to ensure that the correct type of relay was installed in each location.

A review of the work orders and as-built inspection of the SSPS relay output cabinets confirmed that the MDR relays were installed in accordance with WBNEEBIDQOO209920100002 and no Potter & Brumfield MDR relays were installed in a prohibited location.

3. Calculation WBNEEBIDQ00209920100001, Rev. 0 "SSPS ESFAS Slave & Interposing Relay Service Life Determination - Unit 2" confirmed that the Potter & Brumfield MDR style AC relays used to actuate Unit 2 ESFAS functions exist in an environment that meets the environmental standards that were stipulated in WCAP- 13878.

WCAP-13878 and the NRC concluded that Potter & Brumfield MDR ESFAS relays that meet the requirements stated in the WCAP can justifiably extend their surveillance test interval from a 3 month interval to a refueling interval. Based on the conclusions of calculation WBNEEBIDQ00209920100001, the WBN 18 month surveillance interval is appropriate.

In addition, in Reference 2, TVA committed to revise applicable attachments of TI-119, "Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting," prior to implementation of the approved Unit 2 TS. This procedure change will require that the surveillance interval be evaluated and reduced, when needed, if two or more Potter & Brumfield MDR series relays used for Unit 2 TS LCOs 3.3.2 and 3.3.6 fail within a 12-month interval. Appropriate wording is already provided in TI-119 for the Type AR relays. TVA believes that this commitment is appropriate for an inspector confirmatory item as opposed to an SSER open item.

NRC Question 8

In TS section 3.3.2, "ESFAS Instrumentation", SR 3.3.2.8; the following words were added at the end of the surveillance note:

"for manual initiation"

The note now reads: "Verification of setpoint not required for manual initiation."

Provide a justification for this change including where in the FSAR or the SSER it is addressed.

TVA Response

This note was changed to match the wording for SR 3.3.2.8 in TSTF-493, Rev. 4. No setpoint is required or specified for this manual action. Manual action for these functions is taken if the required automatic response did not occur. This is specified in plant operating procedure E-O, "Reactor Trip or Safety Injection."

NRC Question 9

In TS section 3.3.2, "ESFAS Instrumentation", Functional Unit 6.d, "Auxiliary Feedwater, Loss of Offsite Power", the following note was added to the surveillance requirement:

"Notes (b) and (c) are applicable to SR 3.3.5.2 for this function."

Provide a justification for this change including where in the FSAR or the SSER it is addressed.

TVA Response

The notes added to the TS Section 3.3.2 Table with respect to Auxiliary Feedwater are consistent with the Westinghouse Standard TS and TSTF-493 R4 Option A. The notes are consistent with the Westinghouse Setpoint Methodology and the descriptions in FSAR Section 7.1.2. They also comply with the positions noted by the NRC in Regulatory Issue Summary (RIS) 2006-17. SSER 23 provides NRC acceptance of the setpoint methodology for WBN Unit 2 including that it meets RIS 2006-17.

NRC Question 10

In TS section 3.3.2, "ESFAS Instrumentation", Functional unit 6.e, "Auxiliary Feedwater, Trip of all Turbine Driven Main Feedwater Pumps"; the AV was changed from ≥ 48 psig to ≥ 43.3 psig.

Provide a justification for this change including where in the FSAR or the SSER it is addressed.

Also, provide summary calculations used for determining the AV, NTSP, Total Loop Uncertainty, As-Found and As-Left Tolerances, as applicable, and a description of the methodology used to make the calculations.

TVA Response

The change to the Auxiliary Feedwater Trip of all Turbine Driven Main Feedwater Pumps Allowable Value was made to calculate the value in accordance with the requirements of TSTF-493. These instruments are not safety-related and thus have no Safety or Analytical Limits. The allowable value was calculated in Setpoint and Scaling calculation 2-PS-046-13 and -40 based on the methodology provided in TVA EEB-TI-28. This TI was provided to the NRC in Reference 4. The general FSAR discussion of setpoint methodology is provided in FSAR Section 7.1. NRC's review of the TVA Setpoint Methodology for the RTS is contained in SSER 23. NRC concluded that the methodology meets the relevant requirements of the SRP and is therefore acceptable. WBN Unit 1 has not updated to TSTF-493 methods and this is the reason for the differences. The specific TS values are not discussed in the FSAR, the TS Bases, or in an SSER.