## WBN2Public Resource

**From:** Poole, Justin
**Sent:** Monday, January 07, 2013 4:31 PM
**To:** Arent, Gordon
**Cc:** Bryan, Robert H Jr; WBN2HearingFile Resource
**Subject:** DRAFT - Request for Additional Information Regarding Technical Specification Review - I&C
**Attachments:** DRAFT Request for Additional Information - EICB.docx

Gordon,

In reviewing TVA's proposed TS for WBN 2, the staff has come up with the attached questions. Please review to ensure that the RAI questions are understandable, the regulatory basis is clear, there is no proprietary information contained in the RAI, and to determine if the information was previously docketed. If further clarification is needed, and you would like to discuss the questions in a conference call, let us know. Please also let me know how much time TVA needs to respond to the RAI questions. This email does not convey a formal NRC staff position, and it does not formally request for additional information.

*Justin C. Poole*
*Sr. Project Manager*
*NRR/DORL/LPL2-2*
*U.S. Nuclear Regulatory Commission*
*(301)415-2048*
*email: Justin.Poole@nrc.gov*

**Hearing Identifier:** Watts_Bar_2_Operating_LA_Public
**Email Number:** 767

**Mail Envelope Properties** (19D990B45D535548840D1118C451C74D01698127F98B)

**Subject:** DRAFT - Request for Additional Information Regarding Technical Specification Review - I&C
**Sent Date:** 1/7/2013 4:30:54 PM
**Received Date:** 1/7/2013 4:30:56 PM
**From:** Poole, Justin

**Created By:** Justin.Poole@nrc.gov

**Recipients:**
"Bryan, Robert H Jr" <rhbryan@tva.gov>
Tracking Status: None
"WBN2HearingFile Resource" <WBN2HearingFile.Resource@nrc.gov>
Tracking Status: None
"Arent, Gordon" <garent@tva.gov>
Tracking Status: None

**Post Office:** HQCLSTR02.nrc.gov

| Files | Size | Date & Time |
|---|---|---|
| MESSAGE | 803 | 1/7/2013 4:30:56 PM |
| DRAFT Request for Additional Information - EICB.docx | 28962 | |

**Options**
**Priority:** Standard
**Return Notification:** No
**Reply Requested:** No
**Sensitivity:** Normal
**Expiration Date:**
**Recipients Received:**

**REQUEST FOR ADDITIONAL INFORMATION**
**WATTS BAR NUCLEAR PLANT, UNIT 2**
**TECHNICAL SPECIFICATIONS CHANGES (TAC NO. ME7713)**

**Instrumentation and Controls Branch**

By letter dated February 28, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12065A036), the Tennessee Valley Authority (the applicant) submitted developmental Revision G of the Watts Bar Nuclear (WBN) Unit 2, Technical Specifications (TS) and TS Bases.

The staff of the Instrumentation and Controls Branch (EICB) is reviewing the applicant's submittal for the areas under our review responsibilities and determined that the following additional information is needed to complete the review, as outlined below:

1. In TS section 3.3.1, "RTS Instrumentation", surveillance requirements SR 3.3.1.3 and SR 3.3.1.6; the words *'incore detector or'* were removed from the following sentences:

   SR 3.3.1.3: Compare results of the PDMS measurements to NIS AFD.

   SR 3.3.1.6: Calibrate excore channels to agree with the PDMS measurements.

   The sentences for WBN Unit 1 read:

   SR 3.3.1.3: Compare results of the *incore detector or PDMS* measurements to NIS AFD.

   SR 3.3.1.6: Calibrate excore channels to agree with *incore detectors or* PDMS measurements.

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

2. In TS section 3.3.1, "RTS 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 ≥15% RTP to ≥25% RTP.

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

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

3. In TS section 3.3.1, "RTS Instrumentation", Functional unit 5, "Source Range Neutron Flux"; the Allowable Value (AV) was changed from ≤ 1.5 E5 cps to ≤ 1.33 E5 cps. Please provide a justification for this change including where in the FSAR or the SSER it is addressed.

Also, please provide a copy 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.

4. In TS section 3.3.1, “RTS Instrumentation”, Functional unit 11, “Undervoltage RCPs”; the AV was changed from ≥ 4734 V to ≥ 5112 V, and the NTSP changed from 4830 V to 5400 V.

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

   Please provide a copy 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.

5. In TS section 3.3.1, “RTS Instrumentation”, Functional unit 14.a, “Turbine Trip, Low Fluid Oil Pressure”; surveillance requirement SR 3.3.1.18 was changed to SR 3.3.1.10.

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

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.

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

   Also, please 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.

7. In TS section 3.3.2, “ESFAS Instrumentation”, surveillance requirement 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 Series relays*."

   The proposed changes would extend the test frequency of the Potter and 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 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.

Only Westinghouse Type AR relays with ac coils are within the scope of WCAP-13877. Potter and 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 and Brumfield MDR relays.

However, there is a topical report, WCAP-13878, that addresses the surveillance extension of Potter and 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. I analyses for their plant.
2. Ensure that their procurement program for P&B 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 P&B MDR relays which are used in either normally energized or a 20% duty cycle have been removed from ESFAS applications.
4. Ensure that the contact loading analysis for P&B MDR relays has been performed to determine the acceptability of these relays.

The EICB 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.

Please provide a justification for extending the test frequency of the Potter and Brumfield MDR Series relays to 18 months.

8. In TS section 3.3.2, “ESFAS Instrumentation”, surveillance requirement 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*.”

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

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*."

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

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.

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

    Also, please 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.

11. In TS section 3.3.4, “Remote Shutdown System”, Table 3.3.4-1, Functional unit 4.a, “Decay Heat Removal via SGs, RCS Hot Leg Temperature Indication”; the words “*Refer to Note A below*”, as well as Note A at the bottom of the page were removed.

    In the WBN Unit 1 TS, Note A reads: “*For Function 4a, the temperature indicator for RCS hot leg 4 is not required to be operable for the remainder of Cycle 6.”*

    Please provide a justification for removing Note A in the WBN Unit 2 TS, as well as removing the reference to Note A on functional unit 4.a. Please include where in the FSAR or the SSER this change is addressed.

12. In support of the TS Bases, the FSAR (Amendment No. 108, Page 7.1-8) states:

    > “7.1.2.1.6 Bypasses
    >
    > Bypasses are designed to meet the requirements of IEEE 279-1971, Sections 4.11, 4.12, 4.13 and 4.14. A discussion of bypasses provided is given in Sections 7.2 and 7.3.”

    This FSAR section address both maintenance bypass (e.g., removal from service/operation) and operating bypasses. The questions below are with respect to the design of maintenance bypass features (for which a limited use is allowed in the TS).

    TS Bases section 3.3 (ML100550501 – Starting on PDF page 4 of 176) page B 3.3-4 states:

    > “Generally, three or four channels of process control equipment are used for the signal processing of unit parameters measured by the field instruments…. However, not all unit parameters require four channels of sensor measurement and signal processing. Some unit parameters provide input only to the SSPS, while others provide input to the SSPS, the main control board, the unit computer, and one or more control systems.”

TS Bases section 3.3 (ML100550501 – Starting on PDF page 5 of 176) page B 3.3-5 states:

> "Generally, if a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If one channel fails in a direction that would not result in a partial Function trip, the Function is still OPERABLE with a two-out-of-two logic. If one channel fails, such that a partial Function trip occurs, a trip will not occur and the Function is still OPERABLE with a one-out-of-two logic."
>
> **Note:** The last two sentences of this paragraph provide a summary explanation of how a two-out-of-three system meets the single failure criteria; however, it is not described how the last sentence of IEEE 279-1971 Clause 4.11 is met:
>
> "**4.11 Channel Bypass or Removal from Operation.** The system shall be designed to permit any one channel to be maintained, and when required, tested or calibrated during power operation without initiating a protective action at the systems level. <u>During such operation the active parts of the system shall of themselves continue to meet the single failure criterion.</u>"

(a) Function 9 of Technical Specification Table 3.3.1-1 states that 3 channels are required for the function to meet its LCO requirements. Condition X states that in the event that one channel becomes inoperable, it may be bypassed for up to 12 hours for surveillance testing, and the channel must be placed in trip within 72 hours. The last sentence of IEEE 279-1971, Section 4.11 contains a requirement that the design of the protection system must meet when a component is bypassed or removed from service. TVA has not yet demonstrated how this regulatory requirement is met for functions that are implemented in only three channels; therefore, for each three channel protection system function (e.g., Pressurizer Level – High Trip):

(i) Please provide a summary statement regarding the conformance of the design of the protection system to this requirement.

(ii) Please provide reference to the location where conformance to this regulatory requirement is described in detail.

(b) GDC 21 contains design criteria for bypass or removal from service; however, these design criteria are not explicitly addressed in FSAR section 7.1.2.1.6. For each three channel protection system function (e.g., Pressurizer Level – High Trip):

(i) Please provide a summary of the bases for the conformance of the design of the bypass features, of the protection system, to the GDC 21 bypass criteria.

(ii) Please provide reference to the location where conformance to these criteria is described in detail.

(c) There appear to be some three channel systems that share components for protection and control, for example:

TS Table 3.3.1-1 Function 9 and FSAR Section 7.7.1.6
TS Table 3.3.1-1 Function 15 and FSAR Section 7.7.1.7

(i) Please explicitly identify all three channel protection functions that share components between protection and control systems.

(ii) Please describe how these functions meet the requirements of GDC 21 & 24 as well as IEEE 297-1971 Clauses 4.11 and 4.7.3.

13. TS Bases section 3.3 (ML100550501 – Starting on PDF page 5 of 176) page B 3.3-5 states:

"Generally, if a parameter is used for input to the SSPS and a control function, four channels with a two-out-of-four logic are sufficient to provide the required reliability and redundancy. The circuit must be able to withstand both an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Again, a single failure will neither cause nor prevent the protection function actuation."

**Note:** The last two sentences of above provide a summary explanation of how a two-out-of-four system (with shared components) meets the single failure criteria; however, it is not described how the last paragraph of IEEE 279-1971 Clause 4.7.3 is met:

IEEE 279-1971 Clause 4.7.3 states:

"**4.7.3 Single Random Failure.** Where a single random failure can cause a control system action that results in a generating station condition requiring protective action and can also prevent proper action of a protection system channel designed to protect against the condition, the remaining redundant protection channels shall be capable of providing the protective action even when degraded by a second random failure.

Provisions shall be included so that this requirement can still be met if a channel is bypassed or removed from service for test or maintenance purposes. Acceptable provisions include reducing the required coincidence, defeating the control signals taken from the redundant channels, or initiating a protective action from the bypassed channel."

(a) The second paragraph of IEEE 279-1971, Clause 4.7.3 contains a requirement that the design of a protection system must meet when a component is bypassed or removed from service; however, this requirement is not explicitly addressed in this section of the FSAR.

(i) Please provide a summary statement regarding the conformance of the design of the protection system to this requirement.

(ii) Please provide reference to the location where conformance to this requirement is described in detail.

(b) GDC 24 contains design criteria for bypass or removal from service; however, these design criteria are not explicitly addressed in FSAR section 7.1.2.1.6.

(i) Please provide a summary statement regarding the conformance of the design of the bypass features, of the protection system, to these specific GDC bypass criteria.

(ii) Please provide reference to the location where conformance to these criteria is described in detail.

(c) As stated in the TS Bases section quoted above, there are four channel systems that share components for protection and control; however, the TS bases do not explicitly identify the control systems associated with each protection function.

(i) Please explicitly identify all four channel protection functions (and each associated control system) that share components between protection and control systems.

(ii) Please describe how these functions and systems meet the requirements of GDC 21 & 24 as well as IEEE 297-1971 Clauses 4.11 and 4.7.3.