## WBN2Public Resource

**From:** Poole, Justin
**Sent:** Tuesday, February 15, 2011 4:36 PM
**To:** Carte, Norbert; Garg, Hukam; Singh, Gursharan; Darbali, Samir
**Cc:** WBN2HearingFile Resource
**Subject:** FW: 20110211 Open Item List Master TVA Update 02-14-11.docx
**Attachments:** 20110211 Open Item List Master TVA Update 02-14-11.docx

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

---

**From:** Clark, Mark Steven [mailto:msclark0@tva.gov]
**Sent:** Tuesday, February 15, 2011 4:26 PM
**To:** Crouch, William D; Hilmes, Steven A
**Cc:** Poole, Justin
**Subject:** 20110211 Open Item List Master TVA Update 02-14-11.docx

Bill:

Please forward to Justin to support Thursday's call.

Regards,

*Steve*

Steve Clark
Bechtel Power Corp.
Control Systems
Watts Bar 2 Completion Project
Phone: 423.365.3007
e-mail: msclark0@tva.gov

**Hearing Identifier:** Watts_Bar_2_Operating_LA_Public
**Email Number:** 277

**Mail Envelope Properties** (19D990B45D535548840D1118C451C74D7EFF6D6F79)

**Subject:** FW: 20110211 Open Item List Master TVA Update 02-14-11.docx
**Sent Date:** 2/15/2011 4:35:56 PM
**Received Date:** 2/15/2011 4:36:00 PM
**From:** Poole, Justin

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

**Recipients:**
"WBN2HearingFile Resource" <WBN2HearingFile.Resource@nrc.gov>
Tracking Status: None
"Carte, Norbert" <Norbert.Carte@nrc.gov>
Tracking Status: None
"Garg, Hukam" <Hukam.Garg@nrc.gov>
Tracking Status: None
"Singh, Gursharan" <Gursharan.Singh@nrc.gov>
Tracking Status: None
"Darbali, Samir" <Samir.Darbali@nrc.gov>
Tracking Status: None

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

| **Files** | **Size** | **Date & Time** |
|---|---|---|
| MESSAGE | 676 | 2/15/2011 4:36:00 PM |
| 20110211 Open Item List Master TVA Update 02-14-11.docx | 456773 | |

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

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **001** | All | All | EICB (All) | The Watts Bar Nuclear Plant FSAR red-line for Unit 2 (Agency wide Documents Access and Management System Accession Number ML080770366) lists changes to the Unit 1 FSAR and depicts how Chapter 7 of the Unit 2 FSAR will appear at fuel load. Have additional changes been made to Chapter 7 of the Unit 2 FSAR beyond those indicated in ML080770366? Which of the changes identified correspond to digital instrumentation and controls (I&C) components and systems that have not been previously reviewed and approved by the NRC? | 12/15/2009 Presentation Slides<br><br>This item was partially addressed during the December 15, 2009 meeting.<br><br>TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 1 on Page 1 of 15): TVA responded to this request for additional Information. | 1. Y | Closed<br><br>Date: 3/15/2010<br><br>RAI response received. | Closed | EICB RAI ML093230343, Item No. 1 | 3/12/2010 | **NNC 11/19/09:** The FSAR contains mostly description of the function that the various TVA systems must perform. Therefore this question was asked to determine how the systems have been changed.<br><br>**NNC 4/15/10:** The response addresses many systems and should be read by all EICB reviewers. |
| **002** | All | All | EICB (All) | Are there I&C components and systems that have changed to a new or different digital technology without the change being reflected in the FSAR markup? Are there any not-redlined I&C components and systems that have been changed or replaced by digital base technology since Unit 1 was approved? | 12/15/2009 Presentation Slides<br><br>This item was partially addressed during the December 15, 2009 meeting.<br>TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 2 on Page 2 of 15): TVA responded to this request for additional Information. | 2. Y | Closed<br><br>Date: 3/15/2010<br><br>RAI response received. | Closed | EICB RAI ML093230343, Item No. 2 | 3/12/2010 | **NNC 11/19/09:** The FSAR contains mostly description of the function that the various TVA systems must perform. Therefore this question was asked to determine how the systems have been changed.<br><br>**NNC 4/15/10:** The response addresses many systems and should be read by all EICB reviewers. |
| **003** | All | All | EICB (All) | Because a digital I&C platform can be configured and programmed for different applications, the review process can be divided between a review of the platform and a review of the application. For planning and scheduling reasons, it is important to know beforehand which platform has been used in each digital component and system. What is the base platform of each unreviewed digital I&C component and system (e.g., Common Q)? | 12/15/2009 Presentation Slides<br><br>This item was partially addressed during the December 15, 2009 meeting.<br>TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 3 on Page 2 of 15): TVA responded to this request for additional Information. | 3. Y | Closed<br><br>Date: 3/15/2010<br><br>RAI response received. | Closed | EICB RAI ML093230343, Item No. 3 | 3/12/2010 | **NNC 11/19/09:** The FSAR contains mostly description of the function that the various TVA systems must perform. Therefore this question was asked to determine how the systems have been changed.<br><br>**NNC 4/15/10:** The response addresses many systems and should be read by all EICB reviewers. |
| **004** | All | All | EICB (All) | Please identify the information that will be submitted for each unreviewed digital I&C system and component and the associated docketing schedule. | Responder: Webb 1/13/10 Public Meeting<br><br>TVA identified a schedule for docketing some Post Accident Monitoring System (PAMS) documentation, and the new setpoint methodology. No other documentation was discussed.<br><br>Add: By letter dated June 30, 2010, TVA docketed WNA-LI-00058-WBT-P &-NP, "PAMS Licensing Technical Report." WNA-LI-00058-WBT-P Section 4.11 addressed CCF and BTP 7-19.<br><br>TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 4 on Page 3 of 15): TVA responded to this request for additional Information<br><br>Foxboro I/A Segmentation Analysis Calculation DCSSEGMENT, Rev. 0 submitted on TVA letter dated August 11, 2010.<br><br>Data Storm Testing<br><br>(a) Foxboro I/A Segmentation Analysis, Calculation DCSSEGMENT, Rev. 0 submitted on TVA letter to the NRC dated August 11, 2010 (Reference). | 4. Y | Closed<br><br>Date: 3/15/2010 Responsibility: NRC (All) and TVA (Hilmes)<br><br>TVA to address the question of how a Foxboro IA common mode or complete failure impacts the plant accident analysis as described in Chapter 15 of the FSAR. (Demonstrate segments are independent and how a common mode or complete failure is prevented by power supply design and segmentation.)<br><br>NNC 8/19/10: The justification for not performing and D3 analysis contained in the CQ PAMS Licensing Technical Report is not acceptable. TVA to docket a D3 analysis for the CQ PAMS. This will be responded to in Item 64.<br><br>NNC 8/25/10: The | Closed<br><br>TVA to docket a D3 analysis for the Common Q PAMS.<br><br>NNC 8/19/10: TVA segmentation analysis has been received - NRC to review. | EICB RAI ML093230343, Item No. 4 | January 13, 2010<br><br>March 12, 2010<br><br>June 30, 2010<br><br>August 11, 2010<br><br>TVA Letter dated 10/5/10 | **NNC 11/19/09:** LIC-110 Rev. 1 Section 6.2.2 states: "Design features and administrative programs that are unique to Unit 2 should then be reviewed in accordance with current staff positions….TVA will supply a description of the changes implemented at Unit 1 but have not been reviewed for Unit 2 by the NRC technical staff...TVA will also provide the applicable portion of the FSAR and the proposed TSs...In addition, the staff should review items that are identical for WBN Units 1 and 2 that have not previously been reviewed and approved by the NRC staff. These items are changes in the design and licensing basis for WBN Unit 1 that TVA has implemented without NRC prior approval under the 10 CFR 50.59 process."<br>**NNC 4/15/10:** The response addresses many systems and should be read by all EICB reviewers. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (b) Attachment 36 to letter dated 10/5/10 contains Foxboro proprietary drawings 08F802403-SC-2001 sheets 1 through 6. An affidavit for withholding and non-proprietary versions of the drawings will be submitted no later than January 31, 2011.<br><br>(c) Credible Mesh Network Failure Modes<br><br>Attachment 42 to letter dated 10/5/10 contains the mesh network failure analysis.<br><br>(d) Refer to the response to item (c) above. | | segmentation analysis has been read. Please explain why it is believed that failure will not propagate over the peer-to-peer network.<br><br>Looking for an architectural description of the network interconnections similar to the ICS overview, identification of credible failure modes caused by the mesh network and what component(s) prevent mesh network failures from disabling the entire system. What prevents a segment failure from propagating across the mesh network and affecting other segments. | | | | |
| **005** | 7.1.3.1 | | EICB (Garg) | By letter date February 28, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML080770366) TVA provided a "red-lined" version of the FSAR for WBN Unit 2. The purpose of this FSAR "red-line" version was to depict how the Unit 2 FSAR will appear at fuel load. This letter identified “significant FSAR changes” and provided a “X-REF” number for each.<br><br>Change 7.3-1 refers to the following two Summary Reports:<br><br>TVA Letter, P. L. Pace to NRC, dated February.9, 1998, "Watts Bar Nuclear Plant (WBN) Unit 1 - 10 CFR 50.59(b)(2), Changes, Tests and Experiments Summary Report<br><br>TVA Letter, P. L. Pace to NRC, dated September 30, 2005, "Watts Bar Nuclear Plant (WBN) Unit 1 - 10 CFR 50.59, Changes, Tests and Experiments Summary Report"<br><br>Please submit the 50.59 Evaluations for each of these Summary Reports and identify which parts are relevant to the Unit 2 Setpoint Methodology. | Responder: Craig/Webb<br><br>TVA Letter Dated February 5, 2010: TVA provided the Unit 2 setpoint methodology (WCAP-177044-P Revision 0 - dated December).<br><br>TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 5 on Page 5 of 15): TVA responded to this request for additional Information<br><br>This item is addressed as follows:<br><br>1. FSAR Amendment 100 which was submitted on TVA letter to the NRC dated August __, 2010 incorporates as-found and as-left setpoint tolerance discussion into section 7.1.2.1.9, adds EEB-TI-28, Setpoint Methodology to the section 7.1 references and adds a reference to 7.1.2.1.9 to section 7.2.1.1.10.<br><br>TSTF-493, Rev. 4 Option A has been incorporated into the Unit 2 Tech Spec submittal dated February 2, 2010. | 5. Y | Closed<br><br>Date: 3/15/2010<br>Responsibility: NRC (Garg) and TVA (Hilmes and Crouch)<br><br>RAI response received. This item is closed as this is covered under item 154 later on.<br><br>This item requires further discussion between TVA and the staff concerning the setpoint methodology employed for WBN2.<br><br>See Item 8. | Closed<br><br>FSAR AMD 100 | EICB RAI ML093431118, Item No. 5 | TVA Letter dated 2/5/10<br><br>TVA Letter dated3/12/10 | |
| **006** | | | EICB (Garg) | Amendment 95 of the FSAR, Chapter 7.3, shows that change 7.3-1 consists of updating a reference from revision 5 to revision 7 and making it applicable to Unit 1 only, while adding a new reference, applicable only to Unit 2.<br><br>Reagan, J. R., "Westinghouse Setpoint Methodology for Protection Systems, Watts Bar Units 1 and 2, Eagle 21 Version," WCAP-12096 Rev. 7, (Westinghouse Proprietary Class 2). Unit 1 Only<br><br>WCAP “Westinghouse Setpoint Methodology for Protection System, Watts Bar Unit 2, Eagle 21 Version, WCAP-17044-P. Unit 2 Only.<br><br>Please provide both setpoint methodology documents identified above. | By letter dated February 5, 2010: TVA provided the Unit 2 setpoint methodology (WCAP-177044-P Revision 0 - dated December 2009).<br><br>TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 6 on Page 7 of 15): TVA responded to this request for additional Information.<br><br>a. TVA to docket Rev. 8 and identify that Rev. 8 is the current revision for Unit 1. TVA to identify any NRC approval of Rev. 8.<br><br>In accordance with item 2, below, there is no change to the methodology, therefore revision 8 is not included in this response.<br><br>Westinghouse letter WAT-D-10502 (Attachment 1) describes the two changes to WCAP-12096 Revision. 8. The first | 6. Y | Closed<br><br>This item is reviewed in FSAR amendment 100 review.<br><br>Date: 2/16/2010<br><br>The Westinghouse Setpoint methodology document (WCAP-17044-P Revision 0) identifies that the intermediate and source range calculations were performed by TVA (2-NMD-092-0131). Please provide the intermediate and source range calculations performed by TVA (2-NMD-092-0131). | Closed<br><br>TVA to reference TI-28 for as found and as left value. Also provide the reference to FSAR Section 7.1 for the setpoint methodology.<br><br>This is addressed in FSAR Amendment 100. | EICB RAI ML093431118, Item No. 6 | TVA Letter dated 2/5/10<br><br>TVA Letter dated 3/12/10<br><br>TVA Letter dated 7/30/10 | **NNC:** WCAP-12096 Rev. 7 (ML073460281) is in ADAMS.<br><br>**NNC:** WCAP-12096 Rev. 8 is the current revision for Unit 1.<br><br>TVA to docket Rev. 8 and identify that Rev. 8 is the current revision for Unit 1. TVA to identify any NRC approval of Rev. 8.<br><br>TVA to describe how TVA calculations for Unit 2 are different than Unit 1. If they are the same, TVA to docket such statement under oath and Affirmation. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | change addresses the containment sump level transmitter replacement. This change was submitted under 50.59 summary report (ML073460444, Page 77). The second change is to delete the power range negative flux rate trip. This item was submitted as a Technical Specification change (ML073201052). The Technical Specification change was subsequently approved.<br><br>The current revision of Unit 1 WCAP-12096 is Revision 9. Revision 9 was issued to make the changes required by the Steam Generator Replacement Project. Unit 2 is using the original steam generators, therefore the changes in Revision 9 are not applicable to Unit 2.<br><br>b. TVA to describe how TVA calculations for Unit 2 are different than Unit 1. If they are the same, TVA to docket such statement under oath and Affirmation.<br><br>TVA response letter dated March 12, 2010, Enclosure 1, Item Number. 7 addressed this request; however, the March 12 letter was not submitted under oath and affirmation. This letter fulfills the oath and affirmation requirements for the previous response. | | The Westinghouse Setpoint methodology document (WCAP-17044-P Revision 0) identifies that the undervoltage and underfrequency calculations were performed by TVA (2-27-068-0031). Please provide the undervoltage and underfrequency calculations performed by TVA (2-27-068-0031).<br><br>Work with Item 7 for WCAP-12906 issues. | | | | |
| **007** | 7.1.3.1 | | EICB (Garg) | The setpoint methodology has been reviewed and approved by the NRC staff in Section 7.1.3.1 of NUREG-0847 (ML072060490), NUREG-0847 Supplement No.4 (ML072060524), and NUREG-0847 Supplement No. 15 (ML072060488).<br><br>Please describe all changes from the methodology that has been reviewed and approved by the staff. | TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 7 on Page 7 of 15): TVA responded to this request for additional Information.<br><br>a. TVA will submit WCAP-12096, Rev. 8 if there is a change to the methodology.<br><br>No change in methodology, therefore WCAP-12906, Revision 8 is not submitted.<br><br>b. TVA will supply the 50.59 letter for Rev. 8<br><br>Westinghouse letter WAT-D-10502 (Attachment 1) describes the two changes to WCAP-12096 Revision. 8. The first change addresses the containment sump level transmitter replacement. This change was submitted under 50.59 summary report (ML073460444, Page 77). The second change is to delete the power range negative flux rate trip. This item was submitted and approved as a Technical Specification change (ML073201052).<br><br>c. TVA to locate transmittal letter that submitted Rev. 7.<br><br>Refer to response to Item 1. TVA responded to this request for additional Information in letter dated March 12, 2010, Enclosure 1, Item Number 6.<br><br>d. TVA to determine the last revision of WCAP-12096 where there was a change in methodology.<br><br>Previous revisions to WCAP-12096 have been due to hardware changes. The calculation methodology has not changed since revision 0. | 7. Y | Closed<br>This item is reviewed in FSAR 100 review.<br><br>Date: 1/13/2010<br><br>RAI response received. NRC to review response.<br><br>TVA will submit WCAP-12096, Rev. 8 if there is a change to the methodology.<br><br>TVA will supply the 50.59 letter for Rev. 8<br><br>TVA to locate transmittal letter that submitted Rev. 7.<br><br>TVA to determine the last revision of WCAP-12096 where there was a change in methodology.<br><br>Work with Item 6 for WCAP-12906 issues. | Closed<br><br>Same as Item 6 above<br><br>This is addressed in FSAR Amendment 100. | EICB RAI ML093431118, Item No. 7 | TVA Letter dated 3/12/10<br><br>TVA Letter dated 7/30/10 | TVA to provide Rev. 8 of the Unit 1 document (which is the current one) if there is a change in methodology and identify how the Unit 2 document differs from it. |
| **008** | 7.3 | | CB (Gar | There are several staff positions that provide guidance on setpoint methodology (e.g., Reg Guide 1.105, BTP 7-12, RIS-2006-17 and | TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 8 on Page 7 of 15): TVA responded to this request for | 8. Y | Closed | Closed | EICB RAI ML093431118, Item | TVA Letter dated 3/12/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TSTF-493 Rev. 4). Please identify how the Unit 2 setpoint methodology addresses staff guidance. | additional Information<br><br>This item is addressed as follows:<br><br>1. FSAR Amendment 100 which was submitted on TVA letter to the NRC dated August __, 2010 incorporates as-found and as-left setpoint tolerance discussion into section 7.1.2.1.9, adds EEB-TI-28, Setpoint Methodology to the section 7.1 references and adds a reference to 7.1.2.1.9 to section 7.2.1.1.10.<br><br>2. TSTF-493, Rev. 4 Option A has been incorporated into the Unit 2 Tech Spec submittal dated February 2, 2010. | | | FSAR AMD 100. Closed as it will be covered under item 154 | No. 8 | | |
| **009** | 7.3.2 | 5.6, 6.3.5 | EICB (Darbali) | Change 7.3-2, identified in Watts Bar Nuclear Plant FSAR red-line for Unit 2 (ADAMS Accession Number ML080770366), refers to the following Summary Report: TVA Letter, P. L. Pace to NRC, dated September 20, 2002, "Watts Bar Nuclear Plant (WBN) Unit 1 - 10 CFR 50.59, Changes, Tests and Experiments Summary Report"<br><br>Please provide the 50.59 Evaluation summarized in this Summary Report. | TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 9 on Page 8 of 15): TVA responded to this request for additional Information | 9. Y | Closed<br><br>Date: 3/15/2010<br>Responsibility: NRC (Darbali)<br><br>50.59 evaluation was submitted in the RAI response. | Closed | EICB RAI ML093431118, Item No. 9 | 3/12/10, ML101680598, Item 9 | |
| **010** | 7.3 | 7.3 | EICB (Darbali) | The original SER on Watts Bar (NUREG-0847) documents that the scope of the review of FSAR Section 7.3, “Engineered Safety Features Actuations System,” included: “included single-line, function logic and schematic diagrams, and descriptive information for the ESFAS and those auxiliary supporting systems that are essential to the operation of either the ESFAS or the ESF systems. The review included the applicant's design criteria and design bases for the ESFAS and the instrumentation and controls of auxiliary supporting systems. The review also included the applicant's analyses of the manner in which the design of the ESFAS and the auxiliary supporting systems conform to the design criteria."<br><br>Please provide the information referred to in the quotation and include a description of all changes since this information was reviewed and approved by the NRC staff.<br><br>If some parts of this information is included in the FSAR (e.g., Design Criteria) this information can be explicitly referenced in the response to this question. | TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 10 on Page 8 of 15): TVA responded to this request for additional Information.<br><br>TVA Letter (ML073550386) dated FEB 26 1992: docketed WCAP-12374 Rev. 1 (ML080500664). | 10. Y | Closed | Closed<br><br>Replaced by OI 314 | EICB RAI ML093431118, Item No. 10 | 3/12/10, ML101680598, Item 10 | |
| **011** | 7.3.2 | 5.6, 6.3.5 | EICB (Darbali) | NUREG-0847 Supplement No. 2 Section 7.3.2 includes an evaluation of a change in containment sump level measurement. Provide information to demonstrate that Unit 2 implements the containment sump level indication as described and evaluated in NUREG-0847 Supplement No. 2, Section 7.3.2, for Unit 1. | TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 11 on Page 13 of 15): TVA responded to this request for additional Information | 11. Y | Closed<br><br>Date: 3/15/2010<br>Responsibility: NRC (Darbali)<br><br>Requested information was submitted in the RAI response. | Closed | EICB RAI ML093431118, Item No. 11 | ML101680598, Item 9 | |
| **012** | 7.4 | 7.4 | EICB (Darbali) | The original SER on Watts Bar (NUREG-0847) documents that the scope of the review of FSAR Section 7.4, "Systems Required for Safe Shutdown," included single-line and schematic diagrams: "The scope of the review of the systems required for safe shutdown included the single-line and schematic diagrams and the descriptive information for these systems and for the auxiliary systems essential for their operation." | TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 12 on Page 13 of 15): TVA responded to this request for additional Information<br><br>A revised response was included in the 7/30 letter that provides the requested information. | 12. Y | Closed<br><br>Date: 3/15/2010<br><br>TVA provided the following:<br><br>1. Description of what is different from Unit 1 | Closed | EICB RAI ML093431118, Item No. 6 | TVA Letter dated 3/12/10<br><br>TVA Letter dated 7/30/10<br><br>ML101680598, Item 9 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Please provide the single-line and schematic diagrams for the systems required for safe shutdown that are applicable to Unit 2, and include a description of all changes since these diagrams were reviewed and approved by the NRC staff. | | | 2. Road map between functions listed in 7.4 and the FSAR section that describes the equipment that performs the function. Item Closed. | | | | |
| **013** | 7.1.3.1 | | EICB (Garg) | Chapter 7 and Chapter 16 of Amendment 95 to the FSAR do not include any setpoint values. Please describe how and when setpoint values (e.g., TS allowable values) will be provided for Unit 2.<br><br>Please describe the information that will be provided to justify the acceptability of these values. | TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 13 on Page 14 of 15): TVA responded to this request for additional Information | 13. Y | Closed<br><br>Date: 3/15/2010<br><br>RAI response received. Westinghouse is completing the setpoint calculations which will be completed by May 11, 2011. NRC to review response. | Closed<br><br>This item is closed for chapter 7. NRC will review T.S. under different chapter. | EICB RAI ML093431118, Item No. 13 | TVA Letter dated 3/12/10 | TS have been docketed. |
| **014** | All | All | EICB (All) | Provide the justification for any hardware and software changes that have been made since the previous U.S. Nuclear Regulatory Commission (NRC) staff review for Eagle 21 and other platforms | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010: TVA responded to this request for information (Enclosure, Item No. 1) stated: "In discussion with the staff, TVA's understanding is that the focus of this question is the Eagle 21 system. Please refer to Reference 2 [TVA Letter Dated March 12, 2010], Question 10, and TVA letter to NRC dated August 25, 2008, 'Watts Bar Nuclear Plant (WBN) - Unit 2 - Westinghouse Eagle 21 Process Protection System, Response to NRC I&C Branch request for additional information' (Reference 3 [TVA letter dated August 25, 2008]) for the discussion of changes to the Eagle 21 system."<br><br>A listing of changes to other platforms was provided in TVA letter dated April 27, 2010, Enclosure 1, items 21 and 23. | 14. Y | Closed<br><br>NNC: I do not recall saying that the NRC is not interested in changes in other platforms. Please provide a description of changes to other platforms (e.g., SSPS).<br><br>For Eagle 21, this response points to Open Item No. 10.<br><br>Response understood. Additional material will be requested separately to understand the systems described. | Closed | NRC Meeting Summary ML093560019, Item No. 1 | TVA Letter dated 4/27/10 | |
| **015** | | | EICB (Garg) | Verify that the refurbishment of the power range nuclear instrumentation drawers resulted in only like-for-like replacements. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 2). | 15. Y | Closed<br><br>Date: 4/27/10<br>Responsibility: NRC (Garg)<br><br>Response acceptable. Close | Closed | NRC Meeting Summary ML093560019, Item No. 2 | TVA Letter dated 4/27/10 | |
| **016** | | | EICB (Carte) | Identify the precedents in license amendment requests (LARs), if any, for source range monitors or intermediate range monitors. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 3). | 16. Y | Closed<br><br>Date: 4/27/10<br>Responsibility: NRC (Garg)<br><br>Acceptable. Close | Closed | NRC Meeting Summary ML093560019, Item No. 3 | TVA Letter dated 4/27/10 | |
| **017** | 7.3.1 | 7.3.1, 5.5.5, 5.6 | EICB (Darbali) | Identify precedents in LARs, if any, for the solid state protection system. Also, identify any hardware deviation from the precedent. | Date: 4/27/10<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 4). | 17. Y | Closed | Closed | NRC Meeting Summary ML093560019, Item No. 4 | TVA Letter dated 4/27/10<br><br>ML101230248, Item 4 | |
| **018** | | | EICB (Garg) | Identify any changes made to any instrumentation and control (I&C) system based on prior knowledge of failures. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 5). | 18. Y | Closed<br><br>Date: 4/27/10<br>Responsibility: NRC (Garg)<br><br>Acceptable. Close | Closed | NRC Meeting Summary ML093560019, Item No. 5 | TVA Letter dated 4/27/10 | |
| **019** | | | (Garg) | Verify that the containment purge isolation radiation monitor is the | Date: 4/27/10 | 19. Y | Closed | Closed | NRC Meeting | TVA Letter dated | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | same as used in Watts Bar Unit 1, or identify any hardware changes. | By latter dated April 27, 2010 TVA responded to this request for information (Enclosure 1, Item No. 6) for the ratemeter. A newer model, RD-52, of the RD-32 detector assembly used in Unit 1. The detector assembly replacement is due to obsolescence and improved reliability.<br><br>Clarify electronics are analog and the same as unit 1 and the only difference is the detector assembly. | | Date: 4/27/10 | NRC Review | Summary ML093560019, Item No. 6 | 4/27/10<br><br>TVA Letter dated 6/18/10 | |
| **020** | | | EICB (Garg) | Provide environmental qualification information pursuant to Section 50.49 of Title 10 of the Code of Federal Regulations (10 CFR) for safety-related actuation transmitters. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 7). | 20. Y | Closed<br><br>Date: 4/27/10<br>Responsibility: NRC (EEEB)<br><br>Garg to coordinate with Weibi to ensure EEEB takes responsibility for this one. | Closed | NRC Meeting Summary ML093560019, Item No. 7 | TVA Letter dated 4/27/10 | **NNC 4/30/10:** SRP Section 7.0 states: "The organization responsible for the review of environmental qualification reviews the environmental qualification of I&C equipment. The scope of this review includes the design criteria and qualification testing methods and procedures for I&C equipment." |
| **021** | | 7.3 | EICB (Garg) | For the Foxboro Spec 200 platform, identify any changes in hardware from the precedent systems. Provide the design report and the equipment qualification information. | Date: 5/25/10<br><br>No vendor system description is available for the Foxboro Spec 200 system. The hardware description and qualification documents are provided on a component level basis. A TVA generated system description is provided to assist the reviewer. The hardware differences from the unit 1 systems are provided in the loop and card comparison documents. As agreed with the reviewer, the component level documents are not required to be submitted at this time, but may be required later based on the review of attached documents. The following TVA generated documents are provided (Attachment 1):<br><br>1. Analog loop comparison<br><br>2. Analog card comparison<br><br>3. Analog system description | 21. Y | Closed<br>The resolution of this item will be covered by OI#288<br><br>Date: 5/24/10<br><br>The understanding reached in the meeting on April 14, 2010, was that TVA should identify any changes, or state under oath and affirmation that there were no changes. If there were no changes, then the NRC would confirm by inspection.<br><br>A revised response was requested at the 5/24/10 public meeting.<br><br>**Add a brief discussion of the Foxboro Spec 200 to the FSAR let Hukam know on Thursday which section we will add the discussion to.** | Closed | NRC Meeting Summary ML093560019, Item No. 8 | TVA Letter dated 6/18/10 | The resolution of this item will be covered by OI#288.. |
| **022** | 7.3.2 | 5.6, 6.3.5 | EICB (Darbali) | Verify the auxiliary feedwater control refurbishment results in a like-for-like replacement, and identify any changes from the identified precedents. | Date: 4/27/10<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 9).<br><br>The control function of the Auxiliary Feedwater (AFW) Flow for Steam Generator Level is the same as Unit 1. The controllers and signal modifiers/conditioners are Foxboro SPEC 200 discrete analog modules as Unit 1 control loops. The only different Unit 1 uses a 10-50ma signal and Unit 2 is using a 4-20ma. The SPEC 200 control modules operate with a 0-10mv system for both Unit 1 and Unit 2.<br><br>The differences between the Units that have a control function for the AFW system is the differential pressure control upstream of the motor driven AFW pumps 2A-A and | 22. Y | Closed<br><br>Date: 4/27/10<br><br>TVA should confirm if Woodward Governor is the only change.<br><br>See Item 285 for follow up question.<br><br>Response is included in letter dated 10/5/10. | Closed<br><br>to open item 285 | NRC Meeting Summary ML093560019, Item No. 9 | TVA Letter dated 4/27/10<br><br>TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2B-B. Unit 1 still has the analog Bailey/GEMac controllers and signal conditioners. Whereas Unit 2 has converted the controllers and signal conditioners to Foxboro SPEC 200 discrete analog components. Both loops still maintain a Fisher modifier for valve control.<br><br>The four (4) control loops are described below:<br><br>2-P-3-122A<br><br>This loop controls the differential pressure of the Auxiliary Feedwater Pump 2A-A by varying valve 2-PCV-3-122. Differential Pressure Indicating Controller 2-PdIC-3-122A (on panel 2-M-4) can be used either in manual mode or in automatic mode. This loop controls this valve from the Main Control Room when transfer switch 2-XS-3-122 (on panel 2-L-11A) is in the normal position.<br><br>2-P-3-122C<br><br>This loop controls the differential pressure of the Auxiliary Feedwater Pump 2A-A by varying valve 2-PCV-3-122. Differential Pressure Indicating Controller 2-PdIC-3-122C (on panel 2-L-10) can be used either in manual mode or in automatic mode. This loop controls this valve from the Auxiliary Control Room when transfer switch 2-XS-3-122 (on panel 2-L-11A) is in the auxiliary position.<br><br>2-P-3-132A<br><br>This loop controls the differential pressure of the Auxiliary Feedwater Pump 2B-B by varying valve 2-PCV-3-132. Differential Pressure Indicating Controller 2-PdIC-3-132A (on panel 2-M-4) can be used either in manual mode or in automatic mode. This loop controls this valve from the Main Control Room when transfer switch 2-XS-3-132 (on panel 2-L-11B) is in the normal position.<br><br>2-P-3-132C<br><br>This loop controls the differential pressure of the Auxiliary Feedwater Pump 2B-B by varying valve 2-PCV-3-132. Differential Pressure Indicating Controller 2-PdIC-3-132C (on panel 2-L-10) can be used either in manual mode or in automatic mode. This loop controls this valve from the Auxiliary Control Room when transfer switch 2-XS-3-132 (on panel 2-L-11B) is in the auxiliary position.<br><br>Unit 2 controllers are Foxboro model N-250HM-M2NH-F; Signal Converters, current-voltage IN are model N-2AI-I2V, and voltage-current OUT are N-2AO-VAI; Control Card is model N-2AX+A4.<br><br>All components are supplied in accordance with requirements of 10CFR50 Appendix B and ASME NQA-1 as defined in Invensys Systems, Inc. Corporate Quality Assurance Program Requirements, QMS, Revision S, dated October 26, 2007. | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | All components were manufactured with the same materials and processes as those qualified for Nuclear Class 1E Service per IEEE-323-1974 and IEEE-344-1975. | | | | | | |
| **023** | | | EICB (Garg) | Provide environmental qualification (10 CFR 50.49) information for safety-related control transmitters and complete the deviation section of the table. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 10). | 23. Y | Closed<br><br>Date: 12/22/09<br>Responsibility: NRC (EEEB)<br><br>Garg to coordinate with Weibi to ensure EEEB takes responsibility for this one. | Closed | NRC Meeting Summary ML093560019, Item No. 10 | TVA Letter dated 4/27/10 | **NNC 4/30/10:** SRP Section 7.0 states: "The organization responsible for the review of environmental qualification reviews the environmental qualification of I&C equipment. The scope of this review includes the design criteria and qualification testing methods and procedures for I&C equipment." |
| **024** | | | EICB (Carte) | Provide a schedule by the January 13, 2010, meeting for providing information in accordance with I&C Interim Staff Guidance (ISG) 6. | During the January 13, 2010 meeting, TVA presented a schedule for completing various documents for the PAMS system. This schedule did not support TVA's desired schedule. TVA was so informed and said they would work on improving the schedule. TVA said that the setpoint methodology would be provided shortly. No other systems of documentation was discussed.<br><br>By letter dated February 5, 2010 (see enclosure 1), TVA provided a list of documents and associated availability for PAMS.<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 11).<br><br>By letter Dated June 18, 2010 (see Attachment 3) TVA provided a table, "Watts Bar 2 - Common Q PAMS ISG-6 Compliance Matrix." | 24. Y | Closed<br><br>The explanations provided by TVA (that certain information is not required) are unacceptable.<br><br>NNC 8/18/10: The TVA agreement in the Comments column conflicts with the TVA responses to other open items where TVA states that information is available for audit. | Closed<br><br>to Open Item No. 43 | NRC Meeting Summary ML093560019, Item No. 11 | N/A – Request for schedule information | **NNC 4/30/10:** Carte to address response with respect to PAMS and Darbali to address response with respect to RM1000.<br><br>TVA has agreed to submit the requested information on the docket. |
| **025** | 7.5.2 | 7.5.1 | EICB (Singh) | For the containment radiation high radiation monitor, verify that the information provided by TVA is consistent with the information provided with the previously-approved license amendment request for the Duane Arnold plant or provide Phase 3 information. | Date: 4/27/10<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 12). | 25. Y | Closed<br><br>(See OI 300 for additional questions.) | Closed | NRC Meeting Summary ML093560019, Item No. 12 | ML101230248, Item 12 4/27/2010 | |
| **026** | | | EICB (Garg) | Provide environmental qualification (10 CFR 50.49) information for safety-related monitoring transmitters. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 13). | 26. Y | Closed<br><br>Date: 12/22/09<br>Responsibility: NRC (EEEB)<br><br>Garg to coordinate with Weibi to ensure EEEB takes responsibility for this one. | Closed | NRC Meeting Summary ML093560019, Item No. 13 | TVA Letter dated 4/27/10 | **NNC 4/30/10:** SRP Section 7.0 states: "The organization responsible for the review of environmental qualification reviews the environmental qualification of I&C equipment. The scope of this review includes the design criteria and qualification testing methods and procedures for I&C equipment." |
| **027** | 7.7.1.4 | | EICB (Carte) | For Foxboro I/A provide information regarding safety/non-safety-related interaction, common cause failures, and communication with safety related equipment in accordance with ISG 4. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 14): "There is no digital communications or interactions between Foxboro Intelligent Automation (IA) and any Safety-related system." | 27. Y | Closed | Closed | NRC Meeting Summary ML093560019, Item No. 14 | TVA Letter dated 4/27/10 | |
| **028** | | | EICB (Garg) | For the turbine control AEH system, verify that the refurbishment results in a like-for-like replacement. | Responder: Mark Scansen<br>Date: 4/27/10<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 15).<br><br>The requested 50.59 is included in Attachment 1. | 28. Y | Closed<br><br>Response is included in letter dated 10/5/10.<br><br>Provide 50.59 evaluation. Response acceptable. | Closed<br><br>Provide 50.59 | NRC Meeting Summary ML093560019, Item No. 15 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **029** | | | EICB (Carte) | For the rod control system, verify that the refurbishment results in a like-for-like replacement. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 (ML101230248) TVA responded to this request for information (Enclosure, Item No. 16 & Attachment 5): TVA stated on a card by card basis that the refurbished cards have the same form fit and function. | 29. Y | Closed | Closed | NRC Meeting Summary ML093560019, Item No. 16 | TVA Letter dated 4/27/10 | |
| **030** | | | EICB (Garg) | Regarding the refurbishment of I&C equipment, identify any component digital upgrades and, if so, provide the supporting design information. | Responder: Clark<br><br>Date: 4/27/10<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 17).<br><br>There are no other I&C upgrades which contain an imbedded digital processor. | 30. Y | Closed<br><br>Response is included in letter dated 10/5/10.<br>Date: 4/27/10<br><br>Does not state if there are no other upgrade which contain imbedded digital processor. Revised response acceptable. | Closed | NRC Meeting Summary ML093560019, Item No. 17 | TVA Letter dated 10/5/10 | |
| **031** | | | EICB (Carte) | For the rod position indication system (CERPI), provide information in accordance with ISG 4. Need to consider cyber-security issues. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 18). | 31. Y | Closed | Closed | NRC Meeting Summary ML093560019, Item No. 18 | TVA Letter dated 4/27/10 | CERPI is non-safety related.<br>Note: The issue of interlock with rod withdrawal system is addressed in open item 301. (Singh Sept22, 2010) |
| **032** | | | EICB (Carte) | For the process computer, need to consider cyber security issues and emergency response data system needs. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 19). | 32. Y | Closed | Closed | NRC Meeting Summary ML093560019, Item No. 19 | TVA Letter dated 4/27/10 | EICB will no longer consider cyber issues. |
| **033** | | | EICB (Carte) | For the loose parts monitoring system, provide information regarding interactions with safety related equipment. | Date: 4/27/10<br>Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 20): Loose parts is not connected to any other system. | 33. Y | Closed | Closed | NRC Meeting Summary ML093560019, Item No. 20 | TVA Letter dated 4/27/10 | The loose parts monitoring system is not connected to any other system. |
| **034** | | | EICB (Garg) | 2/4/2010<br><br>In the December 15, 2009 public meeting, TVA listed the significant changes made since the Watts Bar Unit 1 Licensing (see below). For each of the following significant changes:<br><br>1) Is the change unique to Unit 2, or will it be the same as what's currently installed in Unit 1?<br><br>2) If it's the same as Unit 1, was this change made under a license amendment or under a 50.59?<br><br>3) When do you plan to submit the detailed information regarding the changes? | Responder: TVA<br><br>By letter dated April 27, 2010 TVA responded to this request for information (Enclosure, Item No. 21).<br><br>Remove all references to Elbow Tap Methodology from Unit 2 Licensing Bases. | 34. Y | Closed<br>Awaiting NRC evaluation of response. | Closed | N/A | TVA Letter dated 4/27/10 | |
| **034.1** | | | EICB (Garg/Singh) | Chapter 7.1 – Introduction<br>Reactor Coolant System Flow Rate Measurement<br>Design Basis Analysis Parameters<br>Loose Parts Monitoring | | 35. Y | Closed | Closed | N/A | N/A | |
| **034.2** | | | (Garg) | Chapter 7.2 - Reactor Trip System | | 36. Y | Closed | Closed | N/A | N/A | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Deletion of Neutron Flux Negative Rate Trip<br>Design Basis Analysis Parameters<br>Alternate Method for Use of Condenser Steam Dump<br>Reactor Coolant System Flow Rate Measurement<br>Foxboro I/A | | | | | | | |
| **034.3** | 7.3 | 7.3 | EICB (Darbali) | Chapter 7.3 – ESFAS<br>Design Basis Analysis Parameters<br>Alternate Method for Use of Condenser Steam Dump | | 37. Y | Closed | Closed<br><br>to item 153 | N/A | N/A | |
| **034.4** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | Chapter 7.5 - Instrumentation Systems Important to Safety<br>Plant Process Computer Replacement<br>Containment Sump Level Transmitter Replacement<br>Safety Injection Systems Cold Leg Accumulator Level Measurement System<br>Common Q/PAMs **This is closed by Norbert.** | | 38. Y | Closed | Closed<br><br>to Item 192 | N/A | N/A | Closed<br><br>RAI not required.<br><br>For plant process computer see Items 192, 193, 194, 195, 196, 198, 199, 203, 204, 206, 216, and 224. |
| **034.5** | 7.5.1.1<br>7.6.1 | 7.5.2<br>7.6.7 | EICB (Marcus/Singh) | Chapter 7.6 - All Other Systems Required for Safety<br>Plant Process Computer Replacement<br>Loose Parts Monitoring System | | 39. Y | Closed | Closed<br><br>to Item 192 | N/A | N/A | Closed<br><br>RAI not required.<br><br>For plant process computer see Items 192, 193, 194, 195, 196, 198, 199, 203, 204, 206, 216, and 224. |
| **034.6** | | | EICB (Singh/Darbali) | Chapter 7.7 Control Systems<br>Alternate Means for Monitoring Control or Shutdown Rod Position<br>Eliminate Pressurizer Backup Heaters on High Level Signal<br>AMSAC Replacement<br>Foxboro I/A<br>WINCISE /Power Distribution Monitoring System (Beacon) | | 40. Y | Closed | Closed<br><br>to item 301 for alternate rod position indication. | N/A | N/A | |
| **035** | | | EICB (Singh) | 2/18/2010<br><br>Please provide a system description of the Digital Metal Impact Monitoring System that contains sufficient detail to support a review of this system using current staff positions. | Responder: Clark<br><br>TVA Letter dated March 12, 2010 Enclosure 1, item 4 responded to this request for information.<br><br>Attachment contains the non-proprietary system description which was developed from proprietary Westinghouse Watts Bar Unit 2 DIMMS-DX Operations and Maintenance Manual, 1TS3176 Rev.0 (Reference ). Westinghouse approved this non-proprietary version for public release via letter WBT-D-2281 dated August 17, 2010 (Reference ) | 41. Y | Closed<br><br>Response is included in letter dated 10/5/10.<br><br>Description provide is not of sufficient detail to allow a regulatory determination. TVA to send the proprietary information for NRC review. At the 9-2 meeting G. Singh stated the system description provided was acceptable and the proprietary information was not required at this time. | Closed<br><br>Att.2 to 10/5/2010 TVA letter provided the information. | RAI No. 1<br>ML102980005<br>10/26/2010 | TVA Letter dated 3/12/10<br><br>TVA Letter dated 10/5/10 | LIC-110 Section 6.2.2 states: "Design features and administrative programs that are unique to Unit 2 should be reviewed in accordance with the current staff positions." Unit 2 FSAR Section 7.6.7, "Loose Part Monitoring (LPMS) system Description," describes a system design that is unique to Unit 2. |
| **036** | 7.5.2 | 7.5.1 | EICB (Carte) | February 18, 2010<br><br>Please provide a system description of the Post Accident Monitoring System that contains sufficient detail to support a review of this system using current staff positions. | Date: 5/25/10<br>Responder: Clark<br><br>In previous letters TVA has provided the Common Q documents that address this item: | 42. Y | Closed | Closed | NRC Meeting Summary<br>ML093560019, Item No. 11 | | **NNC:** Unit 2 FSAR Section 7.5.1, "Post Accident Monitoring Instrumentation," describes a system design that is unique to Unit 2. LIC-110, "Watts Bar Unit 2 License Application Review," states: "Design features and administrative programs that are unique to Unit 2 should then be reviewed in |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | accordance with the current staff positions." |
| **037** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | 2/18/2010<br><br>Is the plant computer a safety-related display system? | Responder: Clark Date: 5/25/10<br><br>As identified in TVA letter dated March 12, 2010, Enclosure 1, item 2, the plant computer system is non-safety related.<br><br>FSAR section 7.5 describes both safety and non-safety related devices and systems. FSAR section 7.1.1.2 is revised in FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1, 2010. | 43. Y | Closed<br><br>Response is included in letter dated 10/5/10.<br><br>August 19, 2010 - TVA to submit markup of FSAR Amendment 100.<br><br>FSAR Amendment 100 states Plant computer system is non-safety related. | Closed 09/16/10 | N/A | TVA Letter dated 10/5/10 | FSAR Amendment 100 provides information<br><br>FSAR Section 7.5, "Instrumentation System Important to Safety," consists of two major subsections: 7.5.1, "Post Accident Monitoring Instrumentation (PAM)," and 7.5.2, "Plant Computer System."<br><br>Regulatory Guide 1.70, "Standard format and content of Safety Analysis Reports for Nuclear Power Plants," Revision 3 dated November 1978 states (see Section 7.1.1): "List all instrumentation, control, and supporting systems that are safety-related including alarms, communication, and display instrumentation." FSAR Section 7.1.1.2, "Safety-Related Display Instrumentation," describes, in the first paragraph, the PAM system, and the second paragraph states: "All other safety-related instrumentation is discussed in Section 7.5." Therefore, to be consistent with the preceding paragraph, the FSAR states that the plant computer system is safety related.<br><br>Contrary to the FSAR the slides presented at the December 15, 2010 meeting indicate that the plant process computer is not safety-related. Therefore the docketed material is inconsistent and needs to be clarified.<br><br>RAI not required |
| **038** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | 2/18/2010<br><br>Please provide a description of the interfaces between: (1) the Safety Parameter Display System and (2) the Technical Support Center and Nuclear Data Links with the plant control and safety systems. This Description should contain sufficient detail to support a review of these interfaces using current staff positions. | Responder: Clark Date: 5/25/10<br><br>FSAR sections 7.1.1.2 and 7.5.2 are revised to address this comment in FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1, 2010. | 44. Y | Closed<br><br>Response is included in letter dated 10/5/10.<br><br>August 19, 2010 - TVA to submit markup of FSAR Amendment 100.<br><br>NRC confirmed FSAR Amendment 100 provides details on interfaces. | Closed<br><br>NRC issue formal RAI. | EICB RAI ML102861885 Item No. 19 | TVA Letter dated 10/5/10 | The slides presented at the December 15, 2010 meeting (ML093520967) indicate that the plant process computer has been replaced.<br><br>EICB RAI ML102861885 sent to DORL |
| **039** | | | EICB (Garg) | January 13, 2010<br><br>Please describe the change to the calculation of the estimated average hot leg temperature (see FSAR Section 7.2.1.1.4, page 7.2-14 Version WBNP-96) in sufficient detail to support a review of this system using current staff positions. | Responder: Clark Date: 5/25/10<br><br>Refer to revised equations in FSAR amendment 98. | 45. Y | Closed<br><br>Date: 1/13/2010<br>Responsibility: TVA<br><br>NRC staff will review | Closed | EICB RAI ML102910008 OI#37 | FSAR amendment 98 | The equation for the calculation of the estimated average hot leg temperature on page 7.2-13 of Revision WBNP-96 of the Unit 2 FSAR is different than the calculation of the average hot leg temperature shown at the top of page |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 7.2-14 of version WBNP-1 of the UNIT 1 FSAR. |
| **040** | | | EICB (Garg) | January 13, 2010<br><br>Please describe the change to the calculation of the power fraction (see FSAR Section 7.2.1.1.4, page 7.2-13 Version WBNP-96) in sufficient detail to support a review of this system using current staff positions. | Responder: Clark Date: 5/25/10<br><br>Refer to revised equations in FSAR amendment 98. | 46. Y | Closed<br><br>Date: 1/13/2010<br>Responsibility: TVA<br><br>NRC staff will review | Closed | EICB RAI EICB RAI ML102910008 OI#38 | FSAR amendment 98 | The equation for the calculation of the power fraction on page 7.2-14 of Revision WBNP-96 of the Unit 2 FSAR is different than the calculation of the power fraction shown at the top of page 7.2-14 of version WBNP-1 of the UNIT 1 FSAR. |
| **041** | 7.5.2 | 7.5.1 | EICB (Carte) | 2/19/2010<br><br>Please provide the following Westinghouse documents:<br>(1) WNA-DS-01617-WBT Rev. 1, "PAMS System Requirements Specification"<br>(2) WNA-DS-01667-WBT Rev. 0, "PAMS System Design Specification"<br>(3) WNA-CD-00018-GEN Rev. 3, "CGD for QNX version 4.5g"<br>Please provide the following Westinghouse documents or pointers to where the material was reviewed and approved in the CQ TR or SPM:<br>(4) WNA-PT-00058-GEN Rev. 0, "Testing Process for Common Q Safety systems"<br>(5) WNA-TP-00357-GEN Rev. 4, "Element Software Test Procedure" | Responder: WEC<br><br>Items (1) and (2) were docketed by TVA letter dated April 8, 2010.<br><br>**Item (3) will be addressed by Revision 2 of the Licensing Technical Report. Due 12/3/10**<br><br>Item (4) will be addressed by Westinghouse developing a WBN2 Specific Test Plan to compensate for the fact that the NRC disapproved WNA-PT-00058-GEN during the original Common Q review. **Due 12/7/10**<br><br>Item (5) Procedures that are listed in the SPM compliance table in the Licensing Technical Report revision 1 supersede that test procedure WNA-TP-00357-GEN.**Due 10/22/10**<br><br>For Item 3, Attachment 19 contains the Westinghouse document "Post-Accident Monitoring System (PAMS) Licensing Technical Report," WNA-LI-00058-WBT, Revision 2, dated December 2010. Attachment 20 contains the Westinghouse Application for Withholding for the "Post-Accident Monitoring System (PAMS) Licensing Technical Report," WNA-LI-00058-WBT, Revision 2, dated December 2010.<br><br>For Item 4, Attachment 9 contains the Westinghouse document "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Post Accident Monitoring System Test Plan," WNA-PT-00138-WBT, Revision 0, dated November 2010. Attachment 10 contains the Westinghouse Application for Withholding for the WNA-PT-00138-WBT, Revision 0 "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Post Accident Monitoring System Test Plan," WNA-PT-00138-WBT, Revision 0, dated November 17, 2010.<br><br>**TVA Response to Follow-up NRC Request**<br>As agreed, a revised test plan document will not be submitted. The issues with the WNB Unit 2 test plan document WNA-PT-00138-WBT Rev. 0 will be addressed by submitting a non-proprietary WBN Unit 2 specific Test Summary Report. | 1. N | Open<br><br>Final Response included in letter dated 12/3/10<br><br>Partial Response is included in letter dated 10/5/10.<br>The SysRS and SRS incorporate requirements from many other documents by reference.<br><br>**NNC 8/25/10:** (3) An earlier version of this report was docketed for the Common Q topical report; therefore, there should be no problem to docket this version. (4) Per ML091560352, the testing process document does not address the test plan requirements of the SPM. Please provide a test plan that implements the requirements of the SPM. | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 1/27/11:** Issues with the STP were discussed in the weekly public meetings. Westinghouse to:<br>(1) perfrom STP self assessment., and<br>(2) Augment Test Summary report to provide missing test plan information<br><br>**NNC 2/3/11:** At next audit compare & discuss:<br>(1) WNA-PT-00058-GEN Rev. 0<br>(2) WNA-PT-00138-WBT Rev. 0<br>(3) AP1000 STP | NRC Meeting Summary NRC Meeting Summary ML093560019, Item No. 11 | TVA Letter dated 6/18/10<br><br>TVA Letter dated 10/5/10 | See also Open Item Nos. 226 & 270. |
| **042** | All | All | EICB (All) | February 25, 2010: Telecom<br><br>On December 16, 2009: EICB stated to DORL: "I am having trouble reading the drawings in the binder that was given to me. Is it possible to produce a set of full size drawing that are in the | Date: 5/25/10<br>Responder: Clark<br><br>Attachment 2 provides a drawing cross reference list for FSAR Chapter 7 and electronic copies of the fully legible | 47. Y | Closed<br><br>Date: 2/25/2010<br>Responsibility: TVA | Closed | EICB RAI ML102910002 Item No. 1 | TVA Letter dated 6/18/10 | The drawing provided did not have the identification numbers as in the FSAR. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | FSAR?"<br><br>On February 23, 2010: EICB received a set of enlarged Chapter 7 FSAR pages (drawings) that are still unreadable.<br><br>Please provide readable drawings | current drawings previously submitted in full size hard copies. | | TVA provided readable drawings. | | | | |
| **043** | 7.5.2 | 7.5.1 | EICB (Carte) | 2/19/2010<br><br>The PAMS ISG6 compliance matrix supplied as Enclosure 1 to TVA letter dated February 5, 2010 is a first draft of the information needed. The shortcomings of the first three lines in the matrix are:<br><br>Line 1: Section 11 of the Common Q topical report did include a commercial grade dedication program, but this program was not approved in the associated SE. Westinghouse stated that this was the program and it could now be reviewed. The NRC stated that TVA should identified what they believe was previously reviewed and approved.<br><br>Line 2: TVA stated the D3 analysis was not applicable to PAMS, but provided no justification. The NRC asked for justification since SRP Chapter 7.5 identified SRM to SECV-93-087 Item II.Q as being SRP acceptance criteria for PAMS.<br><br>Line 3: TVA identified that the Design report for computer integrity was completed as part of the common Q topical report. The NRC noted that this report is applicable for a system in a plant, and the CQ topical report did no specifically address this PAMS system at Watts Bar Unit 2.<br><br>NRC then concluded that TVA should go through and provide a more complete and thorough compliance matrix. | Responder: WEC Date: 5/25/10<br><br>The PAMS ISG6 compliance matrix supplied as Enclosure 1 to TVA letter dated February 5, 2010 is a first draft of the information needed.<br><br>By letter dated April 8, 2010 TVA provided the PAMS Licensing Technical Report provided additional information.<br><br>Attachment 3 contains the revised Common Q PAMS ISG-6 Compliance Matrix, dated June 11, 2010, that addresses these items (Reference 13).<br><br>By letter Dated June 18, 2010 (see Attachment 3) TVA provided a table, "Watts Bar 2 - Common Q PAMS ISG-6 Compliance Matrix."<br><br>It is TVA's understanding that this comment is focused on the fact that there are documents that NRC has requested that are currently listed as being available for audit at the Westinghouse offices. For those Common Q PAMS documents that are TVA deliverable documents from Westinghouse, TVA has agreed to provide those to NRC. Westinghouse documents that are not deliverable to TVA will be available for audit as stated above. Requirements Traceability Matrix issues will be tracked under NRC RAI Matrix Items 142 (Software Requirements Specification) and 145 (System Design Specification). Commercial Item Dedication issues will be tracked under NRC RAI Matrix Item 138. This item is considered closed.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>WNA-LI-00058-WT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1) contains the following changes to address the NRC requests:<br><br>(1) While RSEDs are not specifically mentioned, Section 7 has been revised to be applicable to both hardware and software which includes the RSEDs.<br>(2) Table 6-1 item 15 reference added for WNA-VR-00280-WBT (RESD)<br><br>**TVA Response to Second Follow-up NRC Request:**<br>This item will be addressed by updating the Compliance Matrix in the Licensing Technical Report and by adding a System Requirements Specification Compliance matrix to the Revision 3 of the Licensing Technical Report. | 2. N | Open<br><br>Revised response included in letter dated 12/22/10.<br><br>Response is included in letter dated 10/5/10.<br><br>Revised compliance matrix is unacceptable.<br><br>**NNC 8/12/10:** It is not quite enough to provide all of the documents requested. There are two possible routes to review that the NRC can undertake: (1) follow ISG6, and (2) follow the CQ SPM. The TVA response that was originally pursued was to follow ISG6, but some of the compliance items for ISG6 were addressed by referencing the SPM. The NRC approved the CQ TR and associated SPM; it may be more appropriate to review the WBN2 PAMS application to for adherence to the SPM that to ISG6. In either path chosen, the applicant should provide documents and a justification for the acceptability of any deviation from the path chosen. For example, it appears that the Westinghouse's CDIs are commercial grade dedication plans, but Westinghouse maintains that they are commercial grade dedication reports; this apparent deviation should be justified or explained. | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 2/2/11:** Issues with Common Q TR & SPM compliance were discussed in the weekly public meetings. Westinghouse to perform Common Q TR & SPM compliance self assessment; his will be discussed in detail on the next audit. | EICB RAI ML102910002 Item No. 2 | TVA Letter dated 2/5/10<br><br>TVA Letter dated 5/12/10<br><br>TVA Letter dated 6/18/10<br><br>TVA Letter dated 10/5/10 | **NNC 8/25/10:** A CQ PAMS ISG6 compliance matrix was docketed on: (1) February, 5 12010, (2) March 12, 2010, & (3) June 18, 2010. The staff has expressed issued with all of these compliance evaluations. The staff is still waiting for a good compliance evaluation.<br><br>**NNC 11/23/10:** WNA-LI-00058-WT-P Rev. 1 Section 7 does not include the RSED documents, and it should. Table 6-1 Item No. 15 should also include the RSED RTMs. |
| **044** | 7.5.2 | 7.5.1 | CB (C art | February 25, 2010 | Date: 5/25/10<br>Responder: Clark | 48. Y | Closed | Closed | EICB RAI ML102910002 | TVA Letter dated 6/18/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | The PAMS system described in Section 7.5 of the FSAR is implemented in various manners. TVA should identify:<br>(1) Those variables that are implemented identical to what was reviewed and approved for Unit 1.<br>(2) Those variable that are implemented identical to Unit 1, but that have been changed (e.g., under 50.59) and not reviewed by the NRC.<br>(3) Those variables that are implemented in a manner that is unique to Unit 2 (e.g., using Common Q).<br>TVA should supply supporting information appropriate to the manner of implementation. | By letter Dated June 18, 2010 (see Enclosure 1 Item 6) TVA provided information requested. | | | | Item No. 3 | | |
| **045** | | | EICB (Carte) | February 25, 2010<br><br>For each system implemented using a digital technology, please identify any communications between divisions, or between safety-related equipment and non-safety-related equipment. Please describe the implementation of the associated communications isolation. | Date: 5/25/10<br>Responder: Clark<br><br>There are no communications between divisions. The response includes the description of communications and isolation between the Common Q PAMS, Eagle 21 and RM-1000 radiation monitors and non safety systems. | 49. Y | Closed | Closed | EICB RAI ML102910002 Item No. 4 | TVA Letter dated 7/30/10 (ML102160349 - See Enclosure 1 Item No. 4.) | |
| **046** | | | EICB (Carte) | February 25, 2010<br><br>The Watts Bar Unit 1 Ser (Section 7.2.1, page 7-3) identifies that the RTS includes a trip from the "general warning alarm". Please identify where this trip is described in the current FSAR, or what SSER approved its removal. | Date: 5/25/10<br>Responder: Clark<br><br>FSAR amendment 98, Section 7.2.2.2, page 7.2-29 second paragraph states:<br><br>"Auxiliary contacts of the bypass breakers are connected into the SSPS General Warning Alarm System of their respective trains such that if either train is placed in test while the bypass breaker of the other train is closed, both reactor trip breakers and both bypass breakers will automatically trip." | 50. Y | Closed | Closed | N/A – Request for help finding information | N/A | |
| **047** | 7.5.2 | 7.5.1 | EICB (Carte) | 4/8/2010<br><br>The PAMS System Requirements Specification (SysRS) references RG 1.97 Rev. 3 where the FSAR References Rev. 2. Please explain. | Responder: WEC/Hilmes Date: 5/25/10<br><br>The licensing basis for WBN Unit 2 is Regulatory Guide 1.97 Revision 2. The Common Q PAMS system was designed to Regulatory Guide 1.97 Revision 3, which is why the basis for the System Requirements Specification references revision 3. In order to resolve this discrepancy an engineering evaluation of the Common Q PAMS was performed.<br><br>Attachment 2 contains an engineering evaluation of the Common Q PAMS design against the requirements of Reg. Guide 1.97 Rev. 2. The evaluation concluded that the Common Q PAMS meets all requirements of Reg Guide 1.97 Rev. 2. This evaluation will be added to design criteria WB-DC-30-7, Post Accident Monitoring Instrumentation by October 1, 2010.<br><br>**TVA Revised Response:**<br><br>The difference in revisions of Reg. Guide 1.97 was not identified during the contract review process. Therefore Westinghouse designed the system to the Common Q standard design which is revision 3. When the design work was assigned to a new engineer, the difference in revisions was not identified as an issue. When the issue was identified by the NRC, it was entered into the TVA Corrective Action Process as WBPER233598 (Attachment 3) | 51. Y | Closed<br><br>**NNC 8/9/10:** There are two aspects of this issue. The first aspect has been addressed by the response dated 7/30/10. The second aspect is: How could Westinghouse Design, and TVA approve a design to the wrong requirement?<br><br>The revised response was provided in TVA Letter to the NRC Dated 10/21/10. | Closed | EICB RAI ML102910002 Item No. 5 | TVA Letter dated 7/30/10 (ML102160349 - See Enclosure 1 Item No. 5)<br><br>TVA Letter dated 10/21/10 Enclosure 1 Item No. 1 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| **048** | 7.5.2 | 7.5.1 | EICB (Carte) | April 8, 2010<br><br>Reference 16 of the PAMS System Requirements Specification (SysRS) is the Unit 1 precautions Limitations and Setpoints document. When and how will the transition to the unit 2 document be made? | Date: 5/25/10<br>Responder: WEC<br><br>To ensure technical fidelity with the Unit 1 ICCM-86 system, the Unit 1 PLS was used as an input to the Common Q PAMS System Requirements Specification. This was done to ensure the Unit 2 PAMS had at a minimum the same capabilities and accuracy as the unit 1 system.<br><br>The Unit 2 Common Q PAMS PLS section was developed based on the actual Common Q PAMS system design as reflected in the System Requirements Specification. As such, the Common Q PAMS PLS section is an output of the Common Q PAMS System Requirements Specification. Therefore, no "transition" from the Unit 1 to the Unit 2 PLS is required.<br><br>The Unit 2 PLS is scheduled to be issued December 13, 2010. | 52. Y | Closed | Closed | EICB RAI ML102910002 Item No. 6 | TVA Letter dated 6/18/10 | |
| **049** | 7.5.2 | 7.5.1 | EICB (Carte) | 4/8/2010<br><br>Please provide 00000-ICE-30156 Rev. 6. The PAMS SysRS incorporates sections of this document by reference. | Responder: WEC Date: 5/25/10<br><br>Per Westinghouse letter WBT-D-2024 (Reference 7), this document is available for audit at the Westinghouse Rockville office.<br><br>This document was submitted on September 2, 2010. | 53. Y | Closed | Closed | EICB RAI ML102910002 Item No. 7 | TVA Letter dated 6/18/10<br><br>TVA Letter dated 10/5/10 | |
| **050** | 7.5.2 | 7.5.1 | EICB (Carte) | 4/8/2010<br><br>How should the "shall" statements outside of the bracketed requirements in Common Q requirements documents be interpreted? | Responder: WEC Date: 5/25/10<br><br>These sections are descriptive text and not requirements. The next revision of the Watts Bar Unit 2 PAMS System Requirements Specification will remove "shall" from the wording in those sections. A date for completing the next revision of the System Requirements Specification will be provided no later than August 31, 2010.<br><br>The System Requirements Specification will be revised by September 30, 2010 and submitted within two of receipt from Westinghouse.<br><br>**TVA Revised Response**<br><br>Shall statements within the scope of the System Requirements Specification (SysRS) and System Design Specification (SysDS) were reviewed by Westinghouse. The statements were either relocated to the numbered requirements section or the wording was changed to identify that it was not a requirement. This item is resolved by submittal of revision 2 of the SysRS and the SysDS (attachments 7 and 8 of TVA Letter to NRC dated 10/25/10).<br><br>**TVA Response to Follow-up NRC Request:**<br><br>This item is corrected in the revision 3 requirements documents.<br><br>Attachment 1 contains the proprietary version of WNA-DS- | 54. N | Closed<br><br>Revised response included in letter dated 12/22/10.<br><br>TVA response is inconsistent (e.g., WNA-DS-01667-WBT Rev. 1 page 1-1, Section 1.3.1 implies that "SysRS Section ###" has requirements. See also SDS4.4.2.1-1 on page 4-32).<br><br>Is there a requirement on the shall referenced above??<br><br>Response is provided in letter dated 10/29/10.<br><br>TVA Revised Response in TVA Letter dated 10/29/10 Enclosure 1 Item No. 1 is Acceptable<br><br>**NNC 11/18/10:** Revised Response is not a statement of fact. SysRS Rev. 2 (i.e., WNA-DS-01617-WBT Rev. 2) contains many "shalls" that are not within numbered | Closed<br><br>Due12/22/10<br>Discuss at 11/22 phone call.<br><br>This will be corrected in the Revision 3 document due to TVA 12/10/10<br><br>**NNC 2/3/11:** The docketed material (to date) still has a few unitended "shalls" in it which can be addressed as an open item in the SE. | EICB RAI ML102910002 Item No. 8 | TVA Letter dated 6/18/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item No. 1 | **NNC 11/18/10:** SysRS Rev. 2 contains several "Reference 8", however, Reference 8 has been deleted. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 01617-WBT-P, Revision 3, "Post Accident Monitoring System- System Requirements Specification," dated November 2010. Attachment 2 contains the non-proprietary version WNA-DS-01617-WBT-NP, Revision 3, "Post Accident Monitoring System - System Requirements Specification," dated December 2010. Attachment 3 contains the Application for Withholding Proprietary Information from Public Disclosure, WNA-DS-01617-WBT-P, Revision 3, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Post Accident Monitoring System - System Requirements Specification" (Proprietary), dated December 6, 2010.<br><br>Attachment 4 contains the proprietary version of WNA-DS-01667-WBT-P, Revision 3, "Post Accident Monitoring System – System Design Specification," dated November 2010. Attachment 5 contains the non-proprietary version WNA-DS-01667-WBT-NP, Revision 3, "Post Accident Monitoring System – System Design Specification," dated December 2010. Attachment 6 contains the Application for Withholding Proprietary Information from Public Disclosure, WNA-DS-01667-WBT-P, Revision 3, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System - System Design Specification" (Proprietary), dated December 6, 2010.<br><br>Attachment 7 contains the proprietary version of WNA-SD-00239-WBT-P, Revision 3, "Software Requirements Specification for the Post Accident Monitoring System," dated November 2010. Attachment 8 contains the non-proprietary version WWNA-SD-00239-WBT-NP, Revision 3, "Software Requirements Specification for the Post Accident Monitoring System," dated December 2010. Attachment 9 contains the Application for Withholding Proprietary Information from Public Disclosure, WNA-SD-00239-WBT-P, Revision 3, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Software Requirements Specification for the Post Accident Monitoring System" (Proprietary), dated December 8, 2010. | | requirements sections, for example:<br>(1) Page 2-1, Section 2.3.1 – See guidance statement<br>(2) Page 2-10, top of page 1 – See guidance statement | | | | |
| **051** | | | EICB (Garg) | April 15, 2010<br><br>NRC staff has issued RIS 2006-17, to provide guidance to the industry regarding the instrument setpoint methodology which complies with 10CFR50.36 requirements. The staff has requested all the licensees for the existing license to demonstrate how they meet the guidance provided in this RIS. The staff consider WBN 2 as a license amendment for all the setpoints in the TS. Provide the information on how WBN 2's setpoint methodology meets the guidance of RIS 2006 -17. You may also consider the guidance provided in TSTF - 493, rev.4 as a basis for meeting the RIS 2006 -17 guidance. | Date: 5/25/10<br>Responder: Craig/Webb<br><br>This item is addressed as follows:<br><br>1. FSAR Amendment 100 which was submitted on TVA letter to the NRC dated August __, 2010 incorporates as-found and as-left setpoint tolerance discussion into section 7.1.2.1.9, adds EEB-TI-28, Setpoint Methodology to the section 7.1 references and adds a reference to 7.1.2.1.9 to section 7.2.1.1.10.<br><br>2. TSTF-493, Rev. 4 Option A has been incorporated into the Unit 2 Tech Spec submittal dated February 2, 2010.<br><br>3. Refer to TVA to NRC letter dated August 25, 2008. | 55. Y | Closed<br><br>Date: 4/15/2010<br>Responsibility: TVA<br><br>This item is to be worked with item 108. | Closed<br><br>This item is closed as it will be reviewed under item 154. FSAR AMD 100 | N/A | N/A | Review addressed by another Open Item, |
| **052** | 7.5.2 | 7.5.1 | EICB (Singh) | April 19, 2010<br><br>Please identify the systems that will use the RM-1000 radiation | Date: 5/25/10<br>Responder: Slifer | 56. Y | Closed<br><br>Date: 4/19/2010 | Closed | RAI No. 12<br>ML102980005<br>10/26/2010 | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | monitors. | As identified in TVA letter dated March 12, 2010, Enclosure 1, item 3 the RM-1000 radiation monitors are used for the Containment High Range Post Accident Monitors. | | Responsibility: NRC | | | | |
| **053** | 7.5.2 | 7.5.1 | EICB (Singh) | April 19, 2010<br><br>Please identify all FSAR sections that apply to the RM-1000. | Date: 5/25/10<br>Responder: Slifer<br><br>The containment high range post accident radiation monitors are discussed in FSAR amendment 98 sections 7.5 and 12.3. | 57. Y | Closed<br><br>Date: 4/19/2010<br>Responsibility: NRC | Closed | RAI No. 13<br>ML102980005<br>10/26/2010 | | |
| **054** | 7.5.2 | 7.5.1 | EICB (Singh) | 4/19/2010<br><br>Please describe all the different environments in which the RM-1000 will be required to operate. Please group these environments into two categories (a) Harsh environment, per 10 CFR 50.49, and (b) Mild Environment. | Responder: Slifer/Clark Date: 5/25/10<br><br>The only safety-related application for the RM-1000 is the Containment High Range radiation monitors. The Containment High Range radiation monitors will be installed in the Main Control Room, a mild environment. The detectors will be installed remotely in the containment.<br><br>For WBN Unit 2, a mild environment is defined as:<br><br>A defined room or building zone where (1) the temperature, pressure, or relative humidity resulting from the direct effects of a design basis event (DBE) (e.g., temperature rise due to steam release) are no more severe than those which would occur during an abnormal plant operational condition, (2) the temperature will not exceed 130°F due to the indirect effects of a DBE (e.g., increased heat loads from electrical equipment), (3) the event radiation dose is less than or equal to 1 x 104 rads, and (4) the total event plus the 40 year TID (total integrated dose) is less than or equal to 5 x 104 rads. (Reference 3).<br><br>**What is Reference 3?**<br><br>**TVA Revised Response:**<br><br>Reference 3 is TVA Design Criteria WB-DC-40-54, Environmental Qualification To 10CFR50.49, which provides the definition of mild and harsh environments. Attachment 13 to TVA letter dated October 29, 2010 contains WB-DC-40-54, Revision 4. | 58. Y | Closed<br><br>Revised response is included in letter dated 10/29/10.(TVA to confirm) Design Criteria is WB-DC-40-54 is attached to this letter. | Closed<br>-Response acceptable<br><br>Due 10/14/10<br><br>Identify source of reference 3.<br><br>TVA to identify when and by what letter number WB-DC-40-54 was submitted to NRC. If not previously submitted then please submit this document. | RAI No. 14<br>ML102980005<br>10/26/2010 | TVA Letter dated 6/18/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item No. 2 | |
| **055** | 7.5.2 | 7.5.1 | EICB (Singh) | 4/19/2010<br><br>The "Qualification Test Report Supplement, RM-1000 Upgrades," Document No. 04508905-1SP Rev. A states that the qualification was done in accordance with IEEE 323-1974 and -1983. Please describe and justify all differences in this qualification methodology and that endorsed by Regulatory Guide 1.209. Specifically address EMI and RFI | Responder: Slifer/Clark Date: 5/25/10<br><br>The detectors for these loops will be located in a harsh environment (inside containment). The RM-1000 will be located in the main control room, which is a mild environment. The RM-1000 and associated I/F converters have been tested to the requirements present in IEEE Std. 323-1983 and -1974, as well as the System Requirements including EPRI TR 102323 (Sept. 94) in the design basis.<br><br>Electro-Magnetic-Interference and Radio Frequency Interference (EMI-RFI) testing was performed (the results of the testing are included in the Equipment Qualification Test Report submitted under TVA letter dated March 12, 2010, Reference 4). Since RG 1.209 was not issued until 2007, | 59. Y | Closed<br><br>Revised response is included in letter dated 10/29/10. (TVA to confirm) Design Criteria is WB-DC-40-54 is attached to this letter. | Closed<br>-Response acceptable<br><br>Due 10/14/10<br><br>Identify source of reference 3. | RAI No. 15<br>ML102980005<br>10/26/2010 | TVA Letter dated 6/18/10<br><br>10/14/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item No. 3 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | General Atomics test reports do not reference it.<br><br>For WBN Unit 2, a harsh environment is defined as:<br><br>A defined room or building zone where either (1) the temperature, pressure, and relative humidity resulting from the direct effects of a DBE (e.g., temperature rise due to steam release) are more severe than those which would occur during an abnormal plant operational condition, (2) the temperature will exceed 130°F due to the indirect effects of DBE (e.g., increased heat loads from electrical equipment), (3) the event radiation dose is greater than 1 x 104 rads, or (4) the total event plus the 40-year TID is greater than 5 x 104 rads. (Reference 3)<br>**What is Reference 3?**<br><br>**TVA Revised Response:**<br><br>Reference 3 is TVA Design Criteria WB-DC-40-54, Environmental Qualification To 10CFR50.49, which provides the definition of mild and harsh environments. Attachment 13 to TVA letter dated October 29, 2010 contains WB-DC-40-54, Revision 4. | | | | | | |
| **056** | | | EICB (Singh) | April 19, 2010<br><br>The "RM-1000 Version 1.2 Software Verification and Validation Report," Document No. 04508006 Rev. A, is an incremental report. That is to say it addresses the verification an validation for changes that resulted in Version 1.2; therefore, the NRC has not received a software verification and validation report for all other aspects of the software. Please provide the last complete verification and validation report, and all incremental reports after the complete report. | Date: 5/25/10<br>Responder: Slifer<br><br>The initial draft Software Verification and Validation (V&V) report document, version 1.0, was never issued.<br><br>Attachment 4 contains the latest complete proprietary version 1.1 Software V&V report (04508005). The non-proprietary version and withholding affidavit will be submitted by July 14, 2010. Submittal of the non-proprietary version and withholding affidavit is tracked by Responses to Licensee Open Items to be Resolved for SER Approval item 119.<br><br>The latest proprietary version is 1.2, (an incremental report that addresses the differences from the version 1.1 report) was submitted by TVA Letter dated March 12, 2010 (Reference 4). Submittal of the non-proprietary version and withholding affidavit is tracked by Responses to Licensee Open Items to be Resolved for SER Approval item 101, due June 30, 2010. | 60. Y | Closed<br><br>Date: 4/19/2010<br>Responsibility: NRC<br><br>TVA provided the requested Software V&V Report. | Closed | RAI No. 16<br>ML102980005<br>10/26/2010 | TVA Letter dated 6/18/10 | Sorrento Radiation Monitoring |
| **057** | 7.5.2 | 7.5.1 | EICB (Singh) | 4/19/2010<br><br>Please describe the ability to change the software of the RM-1000 at site, including all required equipment and administrative controls (e.g., temporary digital connections). | Responder: TVA I&C Staff Date: 5/25/10<br><br>Firmware/software changes are done by connecting a laptop to a port on the front of the RM-1000 and placing the Operate/Calibrate switch in the Calibrate position. The first physical barrier to access is the location of the RM-1000 in the main control room which has limited access. The RM-1000 Operate/Calibrate switch is located behind the hinged front panel. The front panel must be opened (held closed by two thumbscrews) to access the switch. This provides a physical barrier to inadvertent switch operation. The system malfunction alarm is visible locally and will annunciate on the control board when the switch is in the Calibrate position. | 61. Y | Closed<br><br>Response is included in letter dated 10/5/10.<br><br>Requested information provided. NRC to review. Further Information Requested: Please confirm that the laptop is secure and access to this laptop is commensurate with the access to the equipment for which it will be used. Is the laptop dedicated | Closed<br><br>Closed by 10/5/2010 TVA letter (Item 11 of letter). | RAI No. 17<br>ML102980005<br>10/26/2010 | TVA Letter dated 6/18/10<br><br>TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Administrative control of software/firmware updates is in accordance with TVA Standard Specification SS-E18.15.01, Software Requirements for Real-Time Data Acquisition and Control Computer Systems, and TVA procedures SPP-9.3, Plant Modifications and Engineering Change Control, and SPP-2.6, Computer Software Control. Approved changes to software/firmware are implemented utilizing the TVA work order process.<br><br>(1) A laptop is not used to calibrate the monitor. All TVA in-house activities (calibration, alarm setpoint adjustment, etc.) are performed using the touchpad on the monitor. An external computer (laptop etc.) is only used to perform software or firmware updates. TVA does not perform software or firmware updates using in-house resources therefore no TVA computer is ever connected to the monitor. If software or firmware updates are required, they are approved via the TVA design change process previously described and implemented by a vendor representative under the TVA work order and Quality Assurance processes.<br>(2) A laptop is not used to calibrate the monitor.<br>(3) See the response to Item 1.<br>(4) See the response to Item 1.<br>(5) No. The connection between the computer and the RM-1000 is made via a standard RS-232 cable.<br>(6) The RS-232 connection on the RM-1000 is used to upload new software versions and is not for calibration.<br>(7) A physical control switch is located behind the front panel on the front edge of the Output Board to change between Operate and Calibration modes on the RM-1000. Placing the switch in the Calibrate position makes the monitor inoperable.<br>(8) See the response to Item 1. | | for calibration of radiation monitors? If the laptop is used for more than one application then please describe the equipment for which the laptop may be used. In addition please explain how software security is assured and that only the software intended for the specific application is used. Is the connection to the radiation monitors made via a special cable/connectors? Please confirm that the RS-232 communication port of the radiation monitors will only be used for calibration purposes. Also please confirm that the radiation monitor will not be in operation during the calibration mode. In addition please confirm that password protection is provided for logging on to the laptop prior to start of calibration. | | | | |
| **058** | 7.5.0 | 7.5 | EICB (Singh) | April 19, 2010<br><br>Please describe all digital communications used in the installed configuration. | Date: 5/25/10<br>Responder: Slifer<br><br>There are no digital communications between the RM-1000 and any other plant system or component. | 62. Y | Closed<br><br>Date: 4/19/2010<br>Responsibility: NRC<br><br>Requested information provided. NRC to review. | Closed | RAI No. 18<br>ML102980005<br>10/26/2010 | TVA Letter dated 6/18/10<br><br>ML101940236, Encl 1, Item 13 | |
| **059** | 7.5.2 | 7.5.1 | EICB (Singh) | April 19, 2010<br><br>Previously TVA provided the "RM-1000 Digital Radiation Processor Technical Manual," Document No. 04508100-1TM Revision C dated October 2003. The "RM-1000 Version 1.2 Software Verification and Validation Report," Document No. 04508006 Rev. A is dated April 2008. (a) What software version does the technical manual address? (b) When was Version 1.2 implemented? | Date:<br>Responder: Slifer<br><br>(a) The technical manual is applicable to versions 1.1 and 1.2 of the software.<br><br>(b) Version 1.2 was implemented April 1, 2008 | 63. Y | Closed<br><br>Date: 4/19/2010<br>Responsibility: NRC<br><br>Requested information provided. NRC to review. | Closed | RAI No. 19<br>ML102980005<br>10/26/2010 | TVA Letter dated 6/18/10 | |
| **060** | 7.5.2 | 7.5.1 | EICB (Carte) | April 19, 2010<br><br>The PAMS System Requirements Specification (SysRS) references RG 1.97 Rev. 3 where the FSAR References Rev. 2. Please explain. | Date: 5/25/10<br>Responder: Clark<br><br>Duplicate of Item 47 | 64. Y | Closed | Closed | N/A | N/A | Addressed by Open Item No. 47 |
| **061** | 7.5.2 | 7.5.1 | EICB (Carte ) | April 19, 2010<br><br>Reference 16 of the PAMS System Requirements Specification | Date: 5/25/10<br>Responder: Clark | 65. Y | Closed | Closed | N/A | N/A | Addressed by Open Item No. 48 |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (SysRS) is the Unit 1 precautions Limitations and Setpoints document. When and how will the transition to the unit 2 document be made. | Duplicate of Item 48. | | | | | | |
| **062** | 7.5.2 | 7.5.1 | EICB (Carte) | April 19, 2010<br><br>Please provide 00000-ICE-30156 Rev. 6. The PAMS SysRS incorporates sections of this document by reference. | Date: 5/25/10<br>Responder: Clark<br><br>Duplicate of Item 49 | 66. Y | Closed | Closed | N/A | N/A | Addressed by Open Item No. 49 |
| **063** | 7.5.2 | 7.5.1 | EICB (Carte) | April 19, 2010<br><br>How should the "shall" statements outside of the bracketed requirements be interpreted? | Date: 5/25/10<br>Responder: Clark<br><br>Duplicate of Item 50 | 67. Y | Closed | Closed | N/A | N/A | Addressed by Open Item No. 50 |
| **064** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the D3 Analysis was April 2, 2010. | Responder: Webb Date: 4/8/2010<br><br>The WBN2 Common Q PAMS provides redundant signal processing and indication of two RG-1.97 Type A variables: Core-Exit Temperature (CET) and Subcooled Margin. In the event of a common-cause failure of the Common Q PAMS, instrumentation diverse from Common Q is available for these two variables. Wide Range (WR) Hot Leg Temperature indication is specified as a diverse variable for CET in the Post-Accident Monitoring Design Criteria, WB-DC-30-7 (Attachment ). WR Hot Leg Temperature indication from all four hot legs is available on control board indicators and plant computer displays.<br><br>Temperature and pressure saturation margin calculations are also performed in the plant computer independently of Common Q utilizing different hardware and software. Isolated outputs from the Eagle 21 protection system are provided to the plant computer for four WR Hot Leg Temperature channels and four WR RCS Pressure channels. The temperature channels and two of the pressure channels are the same as those used in the Common Q saturation margin calculations.<br><br>The plant computer temperature saturation margin is calculated as the difference in the maximum temperature input and the saturation temperature of the minimum pressure input. The temperature saturation margin is displayed as point ID U0987.<br><br>The plant computer pressure saturation margin is calculated as the difference in the minimum pressure input and the saturation pressure of the maximum temperature input. The pressure saturation margin is displayed as point ID U0984.<br><br>Reactor Vessel Level Indication (RVLIS) is defined as a Type B1 variable. Redundant indication for this variable is provided by the core exit thermocouples/$T_{hot}$ and reactor coolant system (RCS) pressure. So long as the RCS pressure is greater than the saturation pressure for the temperature indicated by the core exit thermocouples/$T_{hot}$, there is reasonable assurance that a steam void has not formed in the core and the vessel is full. This is indicated by the subcooled margin monitor/plant computer previously discussed. | 68. Y | Closed | Closed | N/A - No question was asked. Item was opened to track commitment made by applicant. | TVA Letter dated 10/5/10 | |
| **065** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal | Responder: WEC Date: 5/25/10 | 69. Y | Closed | Closed | N/A - No question | TVA Letter dated | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | date for the FMEA was August 31, 2010. | Attachment 37 to letter dated 10/5/10 contains the proprietary version of the Common Q PAMS FMEA and the affidavit for withholding. A non-proprietary version will be provided at a later date. | | | | was asked. Item was opened to track commitment made by applicant. | 10/5/10 | |
| **066** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Watts Bar 2 PAMS Software Design Description (two documents, one for flat panel display and one for AC160)" was March 31, 2010. | Responder: WEC Date: 5/25/10<br><br>Per Westinghouse letter WBT-D-1961 (Reference 8), these items are available for audit at the Westinghouse Rockville office.<br><br>• WNA-SD-00250-WBT Rev. 0 (AC160) was submitted on TVA letter to the NRC dated August 20, 2010 (Reference 7).<br>• WNA-SD-00248-WBT, Rev. 0 (FPDS) was submitted on TVA letter to the NRC dated SEPT 2, 2010 (Reference 8). | 70. Y | **Closed** | **Closed** | N/A - No question was asked. Item was opened to track comm8ittment made by applicant. | TVA Letter dated 6/18/10<br><br>TVA Letter dated 8/20/10<br><br>TVA Letter dated 9/2/10<br><br>TVA Letter dated 10/5/10 | |
| **067** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Commercial Grade Dedication Instructions for AI687, AI688, Upgraded PC node box and flat panels." was September 28, 2010. | Responder: WEC Date: 5/25/10<br><br>The following status is from the revised WB2 Common Q PAMS ISG-6 Compliance Matrix submitted in response to Item 43:<br><br>a. AI687, AI688 – Scheduled for September 28, 2010<br><br>b. Upgraded PC node box and flat panel displays – Per Westinghouse letter WBT-D-2024 (Reference 7), these items are available for audit at the Westinghouse Rockville office.<br><br>c. Power supplies – Per Westinghouse letter WBT-D-2035 (Reference 12), these items are available for audit at the Westinghouse Rockville office.<br><br>To be addressed during 9/20-9/21 audit<br><br>**TVA Response to Follow-up NRC Request:**<br><br>WNA-LI-00058-WT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1) contains the following change to address the NRC request:<br><br>Section 7, "Commercial Grade Dedication Process," has been revised to describe the general commercial grade dedication process for both hardware and software and uses a description of the AI687 dedication process as an example of how the process is applied. | 3. N | Open<br><br>Response included in letter dated 12/22/10.<br><br>This item is addressed in Rev. 2 of the Licensing Technical Report | Open-TVA/WEC<br><br>**Due: 3/29/11**<br><br>**NNC 2/2/11:** Section 7 of the WBN2 PAMS LTR should be updated to include:<br>(1) non-proprietary description of commercial grade dedication, and<br>(2) Software example<br><br>Commercial grade dedication will also be addressed at the next audit. | N/A - No question was asked. Item was opened to track comm8ittment made by applicant. | TVA Letter dated 6/18/10 | |
| **068** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Summary Report on acceptance of AI687, AI688, Upgraded PC node box, flat panels, and power supplies." was September 28, 2010. | Responder: WEC Date: 5/25/10<br><br>The following status is from the revised WB2 Common Q PAMS ISG-6 Compliance Matrix submitted in response to Item 43:<br><br>a. AI687, AI688 – Scheduled for September 28, 2010<br><br>b. Upgraded PC node box – Per Westinghouse letter WBT-D-2024 (Reference 7), this item is available for audit at the Westinghouse Rockville office. | 1. N | Open<br><br>Response included in letter dated 12/22/10.<br><br>This item is addressed in Rev. 2 of the Licensing Technical Report | Open-NRC Review<br><br>**NNC 2/2/11:** Commercial grade dedication will be addressed at the next audit. Summary reports for AI687 & AI688 were **docketed one month late**. | N/A - No question was asked. Item was opened to track comm8ittment made by applicant. | TVA Letter dated 6/18/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | c. Flat panel displays – Per Westinghouse letter WBT-D-2024 (Reference 7), this item is available for audit at the Westinghouse Rockville office.<br><br>d. Power supplies – Per Westinghouse letter WBT-D-2035 (Reference 12), these items are available for audit at the Westinghouse Rockville office.<br><br>To be addressed during 9/20-9/21 audit<br><br>**TVA Response to Follow-up NRC Request:**<br><br>For the commercial grade dedication process, please see the response to Request for Additional Information (RAI) item 3 in this letter, NRC Matrix Item 067.<br><br>The component level EQ/Seismic summary reports for the hardware listed above are available for NRC review/audit as described below:<br><br>(1) AI687 and AI688, the following documents were submitted in TVA Letter to NRC dated October 26, 2010, "Watts Bar Nuclear Plant (WBN) Unit 2 – Instrumentation and Controls Staff Information Requests," (Reference 5):<br>a. EQ-EV-62-WBT, Revision 0, "Common Q PAMS Comparison of Tested Conditions for the AI687 and AI688 Common Q Modules and Supporting Components to the Watts Bar Unit 2 (WBT) Requirements," dated September 10, 2010<br>b. EQLR-171, Revision 0, "Environmental and Seismic Test Report, Analog Input (AI)687 & AI688 Modules for use in Common Q PAMS," dated September 10, 2010<br>c. CN-EQT-10-44, Revision 0, "Dynamic Similarity Analysis for the Watts Bar Unit 2 Post Accident Monitoring System (PAMS)," dated September 28, 2010<br><br>(2) Upgraded PC Node Box – As stated in Westinghouse letter WBT-D-2024, dated June 9, 2010 "NRC Access to Common Q Documents at the Westinghouse Rockville Office," (Reference 6), the following documents are available for NRC audit at the Westinghouse Rockville office:<br>a. CDI-3722, Revision 7, "Next Generation PC Node Box Commercial Dedication Instruction"<br>b. LTR-EQ-10-50 "PC Node Box/Flat Panel Display System Components Qualification Summary"<br><br>(3) Flat Panel Displays – As stated in Westinghouse letter WBT-D-2024, dated June 9, 2010 "NRC Access to Common Q Documents at the Westinghouse Rockville Office," (Reference 6), the following documents are available for NRC audit at the Westinghouse Rockville office:<br>a. CDI-3803, Revision 8, "Next Generation Flat Panel Display (FPD) Commercial Dedication | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Instruction"<br>b. LTR-EQ-10-50 "PC Node Box/Flat Panel Display System Components Qualification Summary"<br>(4) Power supplies – As stated in Westinghouse letter WBT-D-2035 dated June 11, 2010 "NRC Access to Common Q Documents at the Westinghouse Rockville Office" (Reference 7), the following documents are available for NRC audit at the Westinghouse Rockville office:<br>a. CDI- 4057, Revision 4, "Commercial Dedication Instruction"<br>b. EQ-TP-1 05-GEN, Revision 0, "Electromagnetic Compatibility Test Plan and Procedure for Quint Power Supplies and Safety System Line Filter"<br>c. Breakers," EQ-TP-114-GEN, Revision 0, "Seismic Qualification Test Procedure For Common Q Power Supplies, Quint Power Supplies, Line Filter Assemblies, and South Texas Units 3 & 4 Circuit"<br>d. EQ-TP-117-GEN, Revision 0, "Environmental Qualification Test Procedure For Common Q Powe Supplies, Quint Power Supplies, and Line Filter Assemblies" | | | | | | |
| **069** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Watts Bar 2 PAMS Specific FAT Report" was October 2010.<br><br>As agreed, the Watts Bar 2 PAMS Specific FAT Report will not be submitted. Instead a non-proprietary PAMS Test Summary Report will be submitted. | Responder: WEC Date: 5/25/10 | 4. N | Open<br><br>Awaiting for document to be docketed by TVA. | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 2/3/11:** The current due dated above is **4 months later than planned**. | N/A - No question was asked. Item was opened to track comm8ittment made by applicant. | N/A | |
| **070** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Concept and Definition Phase V&V Report" was March 31, 2010. | Responder: WEC Date: 5/25/10<br><br>Per Westinghouse letter WBT-D-1961, this document is available for audit at the Westinghouse Rockville office.<br><br>WNA-VR- 00283-WBT, Rev 0 was submitted on TVA letter to the NRC dated August 20, 2010.<br><br>The submitted V&V did not address the Requirements Traceability Matrix and did not summarize anomalies. At the September 15th public meeting, Westinghouse agreed to include the Concept and Definitions Phase Requirements Traceability Matrix (RTM) in the next IV&V report along with partial Design Phase updates to the RTM.<br><br>**TVA Revised Response:**<br>TVA submitted WNA-VR- 00283-WBT, Rev 0 to NRC in letter dated August 20, 2010<br>(Reference 6).<br>The next Independent Verification and Validation (IV&V) report will include the Design<br>Phase Requirements Traceability Matrix. The Design Phase IV&V Report will be submitted<br>to NRC by February 11, 2011.<br><br>Attachment 14contains the Westinghouse document "Nuclear Automation Watts Bar Unit 2 NSSS Completion Program I&C Projects, IV&V Summary Report for the Post | 71. N | Closed<br><br>Final Response included in letter dated 12/3/10<br><br>Partial Response is included in letter dated 10/5/10.<br><br>Regulations require that the NRC review be based on docketed material. Awaiting for document to be docketed by TVA.<br><br>**NNC 8/25/10:** Requirements Phase SVVR provided by TVA letter dated 8/20/10.<br><br>**NNC 11/23/10:** The requirements Phase SVVR provided by TVA on 8/20/10, is not complete. This report should address the RTM, which it did not. TVA/WEC agreed to address the concept phase RTM in the next revision. | Closed<br><br>**Due 12/17/10**<br><br>**NNC 2/3/11:** SVVR (WNA-VR-00283-WBT) Rev. 0 (dated March 2010) was docketed by TVA letter dated 8/20/10, but was not complete. SVVR Rev. 1 (dated November 2010) was docketed by TVA letter dated 12/3/2010, this is a **delay of more than 8 months.** | N/A - No question was asked. Item was opened to track comm8ittment made by applicant. | TVA Letter dated 6/18/10<br><br>TVA Letter dated 8/20/10<br><br>TVA Letter dated 10/5/10 | **NNC 11/23/10:** The dues date in this open item does not agree with the due dated in Open Item No. 71. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Accident Monitoring System," WNA-VR-00283-WBT, Revision 1, dated November 2010. Attachment 15 contains the Westinghouse Application for Withholding for the WNA-VR-00283-WBT, Revision 1, "Nuclear Automation Watts Bar Unit 2 NSSS Completion Program I&C Projects, IV&V Summary Report for the Post Accident Monitoring System," dated November 8, 2010.<br><br>NOTE: Due to document sequencing, this IV&V Phase Summary Report references a previous version of the contract compliance matrix. Refer to the Licensing Technical Report Revision 2 (Attachment 19) for the current contract compliance matrix. | | | | | | |
| **071** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for Revision 2 of the I V&V Report" covering the Design and Implementation phases was July 30, 2010. | Responder: WEC Date: 5/25/10<br><br>Attachment 16 contains the Westinghouse document "IV&V Summary Report for the Post Accident Monitoring System," WNA-VR-00283-WBT, Revision 2, dated November 2010. Attachment 17 contains the Westinghouse Application for withholding for the "IV&V Summary Report for the Post Accident Monitoring System," WNA-VR-00283-WBT, Revision 2, dated November 2010.<br><br>NOTE: Due to document sequencing, this IV&V Phase Summary Report references a previous version of the contract compliance matrix. Refer to the Licensing Technical Report Revision 2 (Attachment 19) for the current contract compliance matrix. | 72. N | Closed<br><br>Response included in letter dated 12/3/10<br><br>Awaiting for document to be docketed by TVA. | Closed<br><br>**NNC 1/27/11:** Issues with the SVVR were discussed in the weekly public meetings. Westinghouse to perfrom SVVR self assessment.<br><br>**NNC 2/3/11:** SVVR Rev. 2 was docketed by TVA latter dated 12/3/10; this is **4 months later than planned.** | N/A - No question was asked. Item was opened to track commitment made by applicant. | N/A | **NNC 11/23/10:** The dues date in this open item does not agree with the due dated in Open Item No. 70. |
| **072** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Implementation Phase V&V Report" was September 30, 2010. | Responder: WEC Date: 5/25/10 | 73. Y | Closed<br><br>Awaiting for document to be docketed by TVA. | Closed<br>to item 71. Per WEC, the design and implementation phase IV&V reports are combined. | N/A - No question was asked. Item was opened to track commitment made by applicant. | N/A | |
| **073** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for Revision 3 of the IV&V Report covering the Integration phase was October 29, 2010. | Responder: WEC Date: 5/25/10<br><br>WNA-VR-00283-WBT, Revision 3, "IV&V Summary Report for the Post Accident Monitoring System," covers the Integration phase. Attachment 10 contains the proprietary version of "IV&V Summary Report for the Post Accident Monitoring System," WNA-VR-00283-WBT-P, Revision 3, dated December 2010. Attachment 11 contains the non-proprietary version "IV&V Summary Report for the Post Accident Monitoring System," WNA-VR-00283-WBT-NP, Revision 3, dated December 2010. Attachment 12 contains the Application For Withholding Proprietary Information From Public Disclosure WNA-VR-00283-WBT, Revision 3, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, IV &V Summary Report for the Post Accident Monitoring System" (Proprietary), dated December 10, 2010. | 74. N | Closed<br><br>Response included in letter dated 12/22/10<br><br>Awaiting for document to be docketed by TVA. | Closed<br><br>**NNC 1/27/11:** Issues with the SVVR were discussed in the weekly public meetings. Westinghouse to perfrom SVVR self assessment.<br><br>**NNC 2/3/11:** SVVR Rev. 3 was docketed by TVA latter dated 12/22/10; this is **2 months later than planned.** | N/A - No question was asked. Item was opened to track commitment made by applicant. | N/A | |
| **074** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the Post FAT IV&V Phase Summary Report was November 30, 2010. | Responder: WEC Date: 5/25/10 | 5. N | **Open**<br><br>**TVA to provide due date.** | **Open-TVA/WEC**<br><br>**Due TBD**<br><br>**NNC 2/3/11: The** | N/A - No question was asked. Item was opened to track commitment made by applicant. | N/A | Rev. 4 will be available for the NRC audit on 2/28/11. This document will not be submitted. Rev. 5 will be submitted after resolution of the datastorm display issue. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **current due date above is 3 months later than planned.** | | | |
| **075** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Watts Bar 2 PAMS Specific FAT Procedure" was September 30, 2010. | Responder: WEC Date: 5/25/10<br><br>Attachment 12 contains the Westinghouse document "Nuclear Automation Watts Bar Unit 2 NSSS Completion Program I&C Projects, Post Accident Monitoring System Channel Integration Test/Factory Acceptance Test," WNA-TP-02988-WBT, Revision 0, dated November 2010. Attachment 13 contains the Westinghouse Application for Withholding for WNA-TP-02988-WBT, Revision 0,"Nuclear Automation Watts Bar Unit 2 NSSS Completion Program I&C Projects, Post Accident Monitoring System Channel Integration Test/Factory Acceptance Test," dated November 2010. | 75. N | Closed<br><br>Response included in letter dated 12/3/10<br><br>Awaiting for document to be docketed by TVA. | Closed<br><br>**NNC 2/3/11:** FATP docketed as Attachment 12 to TVA letter dated December 3, 2010; this is a **delay of more than 2 months**. | N/A - No question was asked. Item was opened to track commitment made by applicant. | N/A | |
| **076** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for the "Watts Bar 2 PAMS Specific Processor Module Software Test" was August 31, 2010. | Responder: Clark Date: 5/25/10<br><br>Verify schedule dates for the next submittal of this matrix against update WEC schedule. | 76. Y | Closed<br><br>Awaiting for document to be docketed by TVA. | Closed<br><br>to OI 71 and 41(4) | N/A - No question was asked. Item was opened to track commitment made by applicant. | N/A | |
| **077** | 7.5.2 | 7.5.1 | EICB (Carte) | By letter dated March 12, 2010 TVA stated that the target submittal date for seven other documents was "TDB". Please provide a schedule for the docketing of the remaining documents. | Responder: WEC Date: 5/25/10<br><br>The availability dates for these documents are included in the revised WBN2 Common Q ISG-6 Compliance Matrix submitted in response to item 43. As stated in the March 12, 2010 letter (Reference 4), the dates in the matrix are the dates the documents will be available to TVA to prepare for submittal or being "Available for Audit". They do not reflect the dates the documents will be submitted to the NRC. Expected submittal date is two weeks after TVA receives the document.<br><br>Note: There is a typo in the matrix in line item 33. The power supply entry date says TBD. Per Westinghouse letter WBT-D-2035 (Reference 12) this item is complete and the documents are available for audit at the Westinghouse Rockville office.<br><br>The Licensing Technical Report now includes a SPM compliance matrix. Submit a revised response. | 77. Y | Closed<br><br>Open<br><br>Regulations require that the NRC review be based on docketed material. Awaiting for document to be docketed by TVA. | Closed | N/A - No question was asked. Item was opened to track commitment made by applicant. | TVA Letter dated 6/18/10<br><br>10/22/10 | |
| **078** | | | EICB (Garg) | 4/26/2010<br><br>FSAR Section 7.1.2.1.8 adds a reference 6 to the FSAR. However, Reference 6 is for instrument setpoint and has nothing to do with the diversity discussion on the FSAR Section. We believe the TVA wants to add reference 7 which is the diversity document, WCAP 13869, "Reactor Protection System Diversity in Westinghouse Pressurized Water Reactors." Please confirm this and add commitment to revise FSAR to correct the reference. (Q1) Also, confirm whether this WCAP has been reviewed by NRC, if yes, provide reference and if not, then submit the WCAP to NRC. (Q2) Also provide the justification for this reference to WBN2. (Q3) | Responder: Clark Date: 5/25/10<br><br>(Q1) The cross reference information is corrected in FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated August __, 2010 (Reference 2).<br><br>(Q2) WCAP-13869 revision 1 was previously reviewed under WBN Unit 1 SER SSER 13 (Reference 8). Unit 2 references revision 2. A review to identify the differences and justify their acceptability will be performed by September 30, 2010 and submitted to the NRC no later than November 15, 2010.<br><br>(Q3) Westinghouse confirmed the applicability of this WCAP to Watts Bar Unit 2 in letter WBT-D-1321, Final Response to WBT-TVA-0713 Unit 2 WCAP Reviews, dated December 2, 2009 (Reference 10). | 78. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>Awaiting TVA response. | Closed<br><br>to OI323<br><br>FSAR AMD 100 SSER 13 for unit 1 references rev. 1 of WCAP 13869. Rev. 2 is used for Unit 2. Identify all the differences between Rev.1 and Rev.2 and justify their acceptability. | EICB RAI ML102910008 OI# 18 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **079** | | | EICB (Garg) | 4/26/2010<br><br>FSAR Section 7.1.2.1.9, Trip Setpoints, adds reference to 3, 4, and 5. However, reference 3 was deleted by FSAR amendment 81. Reference 4 has been changed to ISA-DS-67.04-1982. Justify applicability of this standard for WBN 2.(Q1) Why the latest ISA standard endorsed by NRC has not been used? (Q2) Also reference 5 is a topical report for Eagle 21, system. Please confirm that this topical report also discusses the setpoint for Eagle 21 system and whether it meets the recent guidance for the setpoint issued by the staff. (Q3) Also, W setpoint methodology do not provide discussion on the AS Found Tolerance and As left value determination and how these values are used for the instrument operability, therefore, add the discussion of these topics in the FSAR. (Q4) and add reference to other documents if it is discussed in some other document. (Q5) Provide this document to the staff for review and approval. (Q6) | Responder: Clark Date: 5/25/10<br><br>(Q1) WBN Unit 2 is licensed based on WBN Unit 1. The WBN Unit 1 licensing basis is ISA-DS-67.04-1982. Therefore this methodology is used for the same SSDs for WBN Unit 2. This maintains consistency in the licensing bases for both units.<br><br>(Q2) Please refer to the response to Q1.<br><br>(Q3) FSAR Reference 4 is the Eagle 21 Topical Report. FSAR Reference 5, WCAP-17044, Westinghouse Setpoint Methodology for Protection Systems Watts Bar Unit 2 submitted under TVA letter to the NRC dated February 12, 2010 (Reference 11) discusses the setpoint methodology used for Eagle 21 loops.<br><br>(Q4) (Q4) FSAR Amendment 100 which was submitted on TVA letter to the NRC dated September 1, 2010 (Reference 2) incorporates as-found and as-left setpoint tolerance discussion into section 7.1.2.1.9, adds EEB-TI-28, Setpoint Methodology to the section 7.1 references and adds a reference to 7.1.2.1.9 to section 7.2.1.1.10.<br><br>(Q5) Please refer to the response to Q4.<br><br>(Q6) EEB-TI-28, Setpoint Methodology was submitted in TVA letter to the NRC dated May 13, 2010 (Reference 12). | 79. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>This item is closed as it will be reviewed under item 154. FSAR AMD 100 | EICB RAI ML102910008 OI#19 | TVA Letter dated 10/5/10 | Reviewed under Item 154 |
| **080** | | | EICB (Singh) | 4/26/2010<br><br>FSAR Table 7.1-1, Note 12 has been added to the table but it's justification has not been provided to the staff for review and approval. | Responder: WEC<br><br>A revised note was included in the 7/30 letter along with justification for the note. | 80. Y | Closed | Closed<br><br>NRC review complete. | RAI No. 2 ML102980005 10/26/2010 | TVA Letter dated 7/30/10 ML102160349, Item 6 | |
| **081** | 7.5.2 | 7.5.1 | EICB (Carte) | 5/6/2010<br><br>The PAMS Licensing Technical Report (WNA-LI-00058-WBT Rev. 0, Dated April 2010), in Section 7, lists codes and standards applicable to the Common Q PAMS. This list contains references to old revisions of several regulatory documents, for example:<br>(1) RG 1.29 - September 1978 vs. March 2007<br>(2) RG 1.53 - June 1973 vs. November 2003<br>(a) IEEE 379-1994 vs. -2000<br>(3) RG 1.75 - September 1975 vs. February 2005<br>(a) IEEE 384-1992 vs. -1992<br>(4) RG 1.100 - June 1988 vs. September 2009<br>(a) IEEE 344-1987 vs. -2004<br>(5) RG 1.152 - January 1996 vs. January 2006<br>(a) IEEE 7-4.33.2-1993 vs. -2003<br>(6) RG 1.168 - September 1997 vs. February 2004<br>(a) IEEE 1012-1986 vs. -1998<br>(b) IEEE 1028-1988 vs. -1997<br>(7) IEEE 279-1991 vs. 603-1991<br>(8) IEEE 323-1983 vs. -1974 (RG 1.89 Rev. 1 June 1984 endorses 323-1974)<br>However, LIC-110, "Watts Bar Unit 2 License Application Review," states: "Design features and administrative programs that are unique to Unit 2 should then be reviewed in accordance with the current staff positions." Please identify all differences between the | Responder: Merten/WEC<br><br>The codes and standards documents listed in Section 7 of the Common Q PAMS Licensing Technical Report are the documents that the Common Q platform was licensed to when the NRC approved the original topical report and issued the approved SER. The WBN Unit 2 Common Q PAMS is designed in accordance with the approved Common Q topical report and approved SER and the codes and standards on which the SER was based. Since the current versions referenced are not applicable to WBN Unit 2, there is no basis for a comparison review.<br><br>Bechtel to develop a matrix and work with Westinghouse to provide justification.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>Attachment 4 contains the results of the TVA analysis of standards and regulatory guides applicable to the Common Q PAMS. Based on the results of the analysis, the Common Q PAMS design meets the applicable requirements and is acceptable. | 6. N | Open<br><br>ML101600092 Item No.1: There are three sets of regulatory criteria that relate to a Common Q application (e.g. WBN2 PAMS):<br>(a) Common Q platform components – Common Q TR<br>(b) Application Development Processes – Common Q SPM<br>(c) Application Specific – current regulatory criteria<br>The Common Q Topical Report and associated appendices primarily addressed (a) and (b). The Common Q SER states:<br><br>'…Appendix 1, "Post Accident Monitoring Systems," provides the functional requirements and conceptual design approach for upgrading an existing PAMS based on Common Q components (page 58, Section | Open-TVA/WEC<br><br>Due 2/25/11<br><br>TVA to provide requested information.<br><br>**NNC 2/3/11:** The above due date has been **missed by at least 2 months.** Please provide new due date. | EICB RAI ML102910002 Item No. 9 | TVA Letter dated 6/18/10 | **NNC 1/5/11:** See Also Open Item No. 86 and 202. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | versions referenced and the current staff positions. Please provide a justification for the acceptability PAMS with respect to these differences. | | | 4.4.1.1, "Description")…On the basis of the above review, the staff concludes that Appendix 1 does not contain sufficient information to establish the generic acceptability of the proposed PAMS design (page 56, Section 4.4.1.3, "PAMS Evaluation")…'<br><br>The NRC did not approve the proposed PAMS design. Section 6, "References," and Section 7, "Codes and Standards Applicable to the Common Q PAMS," of the PAMS Licensing Technical Report contain items that are not the current regulatory criteria.<br><br>Please provide an explanation of how the WBN2 PAMS conforms with the application specific regulatory criteria applicable to the WBN2 PAMS design. For example IEEE Std. 603-1991 Clause 5.6.3, "Independence Between Safety Systems and Other Systems," and Clause 6.3, "Interaction Between the Sense and Command Features and Other Systems," contain application specific requirements that must be addressed by a PAMS system.<br><br>Awaiting TVA Response. | | | | |
| **082** | 7.5.2 | 7.5.1 | EICB (Carte) | 5/6/2010<br><br>The PAMS Licensing Technical Report (WNA-LI-00058-WBT Rev. 0, Dated April 2010), in Section 2.3, lists hardware/software changes to the Common Q PAMS previously reviewed by the NRC. However the Common Q ISG-6 Compliance Matrix does not contain activities that address qualification of all changes specifically:<br><br>2.c - CI527 AF100 Peripheral Component Interconnect (PCI) interface card<br>3. - Common Q TC514 AF100 Fiber Optic Modems (Evolutionary Product Maintenance/Improvements)<br>4.a - PM646A Processor Module<br>4.b - CI631 AF100 Communication Interface Module<br>4.e - DO620 Digital Output Card<br><br>Please provide sufficient detail regarding the changes for the NRC to independently evaluate the acceptability of the changes. | Responder: WEC Date: 6/18/10<br><br>These components can be found in the Summary Qualification Report Of Hardware Testing For Common Q Applications, 00000-ICE-37764, Rev 3 and TWICE Qualification Status Report, WNAQR-00011-SSP Per Westinghouse letter WBT-D-2024, (Reference __) dated June 9, 2010, these documents are available for audit at the Westinghouse Rockville Office.<br><br>TVA provided information by letter dated July 30, 2010 (ML102160349) - See Enclosure 1 Item No. 7.<br><br>Revision 1 of the Licensing Technical Report provides additional detail on the platform specific to WBN2 and references to the evaluation documentation.<br><br>**TVA Response to Follow-up NRC Request:** | 2. N | Open<br><br>Revised response included in letter dated 12/22/10<br><br>Regulations require that the NRC review be based on docketed material. Awaiting for document to be docketed by TVA.<br><br>**NNC 8/9/10:** per telephone conversation on 8/5/10, it is not clear how Westinghouse Commercial Grade Dedication Plans and Reports for Digital I&C. Westinghouse agree to present to the NRC in a public meeting on August 17, 2010, | Open-NRC Review<br><br>**NNC 2/2/11:** Qualification of changes will be addressed at the next audit. The description of the commercial grade dedication process in the CQ PAMS LTR Rev. 2 should be updated to include a non-proprietary description and to include a software example. | EICB RAI ML102910002 Item No. 10 | TVA Letter dated 7/30/10 | **NNC 11/18/10:** See also Open Item No. 41, Item No. 3. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Please see the response to Request for Additional Information (RAI) item 3 in letter dated 12/22/10, NRC Matrix Item 067. | | and explanation of how their system addresses regulatory criteria for both commercial grade dedication and equipment qualification.<br><br>**NNC 8/25/10:** In the August 17, 2010 public meeting Westinghouse stated that the CDI were the plans. The NRC requested that the plans and associated reports be docketed.<br><br>**NNC 11/18/10:** During the September 20-21, 2010 audit, TVA agreed to put a description of the commercial grade dedication program and implementation in Rev. 2 of the CQ PAMS LTR. | | | | |
| **083** | 7.5.2 | 7.5.1 | EICB (Carte) | May 6, 2010<br><br>Please identify all FPGAs in the new or changed PAMS hardware. | Date: 6/18/10<br>Responder: WEC<br><br>The FPGAs used in the Common Q PAMS AC160 module are listed in Westinghouse letter WBT-D-2166, (Attachment 5), which provides both the proprietary and non-proprietary information. Attachment 6 (provided by Reference 11) contains the affidavit for withholding for WBT-D-2166-P-Attachment (contained in Attachment 5)..<br><br>Additionally, Westinghouse states in, Westinghouse Letter WBT-D-2170, (Reference 10) that their review of Flat Panel displays and PC Node Boxes concluded that they do not contain any FPGAs. | 81. Y | Closed<br><br>Date: 5/6/2010<br>Responsibility: TVA | Closed | EICB RAI ML102910002 Item No. 11 | TVA Letter dated 7/30/10 | |
| **084** | 7.5.2 | 7.5.1 | EICB (Carte) | May 6, 2010<br><br>Please provide: TVA Design Criteria WB-DC-30-7 Rev. 22, Post Accident Monitoring Instrumentation. | Date: 6/18/10<br>Responder: Clark<br><br>Attachment 5 contains Design Criteria WB-DC-30-7 Rev. 22, Post Accident Monitoring Instrumentation. | 82. Y | Closed<br><br>Date: 5/6/2010<br>Responsibility: TVA<br><br>Document received | Closed | EICB RAI ML102910002 Item No. 12 | TVA Letter dated 6/18/10 | |
| **085** | 7.5.2 | 7.5.1 | EICB (Carte) | 5/6/2010<br><br>Please provide a detailed description of the PAMS MTP data link to the plant computer. This description should identify all equipment (model & version) and describe the functions that each piece of equipment performs. This description should be of sufficient detail for the NRC to independently evaluate the statements made in WNA-LI-00058-WBT Rev. 0, Section 5.3. | Responder: WEC<br><br>Is the WEC ISG4 evaluation inadequate?<br><br>Operation of the MTP as a barrier device. MTP Fails as a barrier device. Describe what prevents a MTP failure from propagating to the AC160?<br><br>Node loss on the bus? Bus loss?<br><br>Revise the ISG4 section of the Licensing Technical Report (Rev. 2) to provide a more detailed description of the MTP as a barrier device.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>WNA-LI-00058-WBT-P, Revision 2, “Post-Accident | 83. N | Closed<br><br>Revised response included in letter dated 12/22/10<br><br>A response will be provided by 10/31/10<br><br>**NNC 8/11/10:** Design information should be available now. By letter dated July 30, 2010 (ML102160349) TVA stated that the MTP was connected to a Red Hat Linux Server (see Enclosure 1, Item No. 14 part b.). It is presumed that this server is not safety- | Closed<br><br>MTP is postulated, & tested, to fail, but not propagate failures. | EICB RAI ML102910002 Item No. 13 | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Monitoring System (PAMS) Licensing Technical Report" submitted in TVA letter to NRC dated December 3, 2010 (Reference 1), contains the following changes to address the NRC requests:<br><br>Section 2.2, "System Description" page 2-3 provides a description of the MTP Fiber-Optic (FO) data link to the plant computer. Section 2.2.1.4, "Hardware" has been expanded to include a table detailing all hardware changes that have occurred since the initial submittal. Section 2.2.2, "Software" has been expanded to include a table detailing all software changes that have occurred since the initial submittal. | | related. IEEE 603-1991 Clause 5.6.3(1) states, "Isolation devices used to affect a safety system boundary shall be classified as part of the safety system."<br><br>Please describe how the MTP serves as the isolation device. | | | | |
| **086** | 7.5.2 | 7.5.1 | EICB (Carte) | 5/6/2010<br><br>The PAMS Licensing Technical Report (WNA-LI-00058-WBT Rev. 0, Dated April 2010), in Section 6, lists references applicable to the Common Q PAMS. This list contains references to old revisions of several regulatory documents, for example:<br>(1) DI&C-ISG04 - Rev. 0 (ML072540138) vs. Rev. 1 (ML083310185)<br>However, LIC-110, "Watts Bar Unit 2 License Application Review," states: "Design features and administrative programs that are unique to Unit 2 should then be reviewed in accordance with the current staff positions." Please identify all differences between the versions referenced and the current staff positions. Please provide a justification for the acceptability PAMS with respect to these differences. | Responder: WEC Date: 5/24/10<br><br>The regulatory documents listed in the Common Q PAMS Licensing Technical Report are the documents that the Common Q platform was licensed to when the NRC approved the original topical report and issued the approved SER. The WBN Unit 2 Common Q PAMS is designed in accordance with the approved Common Q topical report and approved SER and the regulatory documents on which the SER was based. Since the current versions referenced are not applicable to WBN Unit 2, there is no basis for a comparison review.<br><br>Rev 0 of the Licensing Technical Report references Rev. 1 of ISG4<br><br>**TVA Response to Follow-up NRC Request:**<br><br>The analysis for compliance with DI&C-ISG04, Revision 0 to Revision 1 was previously submitted as part of the Common Q PAMS Licensing Technical Report Revision 2 on December 22, 2010. Attachment 4 contains the results of the TVA analysis of standards and regulatory guides applicable to the Common Q PAMS. Based on the results of the analysis, the Common Q PAMS design is acceptable. | 7. N | Open<br><br>**TVA to address with item OI 81.** | Open-TVA/WEC<br><br>Due 2/25/11<br><br>**NNC 2/3/11:** The above due date has been **missed by at least 2 months.** Please provide new due date. | EICB RAI ML102910002 Item No. 14 | TVA Letter dated 6/18/10 | **NNC 1/6/11:** See Also Open Item No.81 & 202 |
| **087** | 7.5.2 | 7.5.1 | EICB (Singh) | May 6, 2010<br><br>Regarding the Sorrento RM-1000 Digital Radiation Processor: Please identify the model and version to be installed. Please include explicit identification of software version. | Date: 5/24/10<br>Responder: Slifer<br><br>The rate meter is model RM-1000. The software is version 1.2 | 84. Y | Closed<br><br>Date: 5/6/2010<br>Responsibility: TVA | Closed | RAI No. 20 ML102980005 10/26/2010 | TVA Letter dated 6/18/10 | |
| **088** | 7.5.2 | 7.5.1 | EICB (Singh) | May 6, 2010<br><br>Regarding the Sorrento RM-1000 Digital Radiation Processor: Please provide prior software V&V reports. The latest report only addresses Version 1.2. | Date: 5/24/10<br>Responder: Slifer<br><br>See response to item 56 | 85. Y | Closed<br><br>Date: 5/6/2010<br>Responsibility: TVA | Closed | RAI No. 21 ML102980005 10/26/2010 | TVA Letter dated 6/18/10 | |
| **089** | | | EICB (Carte) | 5/6/2010<br><br>What FSAR functions are implemented using Foxboro Intelligent Automation (IA)? | Responder: Clark<br><br>The list of FSAR functions is listed in TVA letter dated March 12, 2010, Enclosure 1, item 12<br><br>FSAR Section 7.7.11 will add a discussion of the DCS.<br><br>See item 4 for questions on failure modes and mesh network. | 86. Y | Closed | Closed | EICB RAI ML102910002 Item No. 15 | TVA Letter dated 3/12/10 | **NNC:** Docketed response states that the applicable FSAR Sections are:<br>5.6 -<br>7.2.2.3.2 - Garg<br>7.2.2.3.3 - Garg<br>7.2.2.3.4 - Garg<br>7.2.2.3.5 - Garg<br>7.2.3 - Garg<br>7.6.8 -<br>7.7.1.6 - |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 7.7.1.7 -<br>7.7.1.8 -<br>9.3.4.2.1.C -<br>10.4.7.2 - |
| **090** | | | EICB (Carte) | 5/6/2010<br><br>What FSAR Systems are implemented using Foxboro Intelligent Automation (IA)? | Responder: Clark Date: 5/25/10<br><br>The list of FSAR functions is listed in TVA letter dated March 12, 2010, Enclosure 1, item 12<br><br>FSAR Section 7.7.11 will add a discussion of the DCS.<br><br>See item 4 for questions on failure modes and mesh network. | 87. Y | Closed | Closed | EICB RAI ML102910002 Item No. 16 | TVA Letter dated 3/12/10 | |
| **091** | 7.4 | 7.4 | EICB (Darbali) | May 20, 2010<br><br>TVA to submit excerpts of EDCRs 52421, 52987, 52321, 52351 and 52601 | Date: 5/25/10<br>Responder: Clark<br><br>1. Attachment 6 contains the EDCR 52421 excerpt<br><br>2. Attachment 7 contains the EDCR 52987 excerpt<br><br>3. EDCR 52321 is scheduled to be issued Oct 13, 2010. Submittal of EDCR 52321 excerpts is tracked by Responses to Licensee Open Items to be Resolved for SER Approval item 103 due October 31,2010.<br><br>4. EDCR 52351 is scheduled to be issued November 30, 2010. Submittal of EDCR 52351 excerpts is tracked by Responses to Licensee Open Items to be Resolved for SER Approval item 104 due December 15, 2010.<br><br>5. Attachment 8 contains the EDCR 52601 (RVLIS) excerpt. The RVLIS EDCR has been split into two EDCRs. The second EDCR is 55385. Submittal of EDCR 55385 excerpts is tracked by Responses to Licensee Open Items to be Resolved for SER Approval item 118 due November 15, 2010. | 88. Y | Closed<br><br>Two EDCRs have been submitted. TVA has agreed to submit the remaining EDCRs. | Closed<br><br>Item is Closed and replaced by items 103, 104 and 118. | EICB RAI No.1 ML102910017, 10/19/10 | TVA Letter dated 6/18/10 | |
| **092** | | | DORL (Poole) | 5/20/2010<br><br>TVA to review Licensee Open Item list and determine which items are proprietary. | Responder: Hilmes<br><br>This item will close when we are no longer using this document as a communications tool. | 1. Y | Open | Open-TVA/Oversight<br><br>Due: SER Issue | | | Continuous review as items are added |
| **093** | | | EICB (Garg) | May 20, 2010<br><br>TVA to submit a letter committing to include setpoint methodology discussion in the FSAR no later than amendment 100. | Date: 5/25/10<br>Responder: Knuettel<br><br>Letter Sent 5/25/10 | 89. Y | Closed | Closed | N/A | N/A | Will be reviewed under item 154 |
| **094** | | | EICB (Garg) | 5/20/2010<br><br>TVA to locate and provide information on the TMI action item to add an anticipated reactor trip on turbine trip to the design bases in the FSAR | Responder: Clark Date: 5/25/10<br><br>This item is described in FSAR amendment 98, Section 7.2.1.1.2 item 6 page 7.2.9, and Table 7.2-1 item 14, page 7.2-39. | 90. Y | Closed<br><br>NRC staff will review. | Closed | N/A | N/A | Information was found in FSAR |
| **095** | 7.8.1, 7.8.4 | XX | EICB (Darbali) | May 20, 2010<br><br>TVA to review SER supplements 5 and 14 item 7.8.1 and | Date:<br>Responder: | 91. Y | Closed | Closed | EICB RAI No. 2 ML102910017, 10/19/10 | TVA Letter dated 7/30/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | supplement 4 item 7.8.4 and confirm if they are identical to Unit 1. If not provide differences. | Q1: Monitoring of the reactor coolant system relief valve position is the same as Unit 1.<br><br>Q2: The reactor trip on turbine trip is the same as Unit 1. | | | | | | |
| **096** | 7.7.5 | XX | EICB (Darbali) | 5/20/2010<br><br>TVA to provide information on implementation of IEN 79-22 and how it is addressed in the FSAR | Responder:<br><br>IEN 79-22 is not specifically listed or discussed in the WBN Unit 1 UFSAR or Unit 2 FSAR. IEN 79-22 is one of the precursors to 10CFR50.49 environmental qualification. The initial SQN and WBN Unit 1 response was developed prior to TVA implementing 10CFR50.49. As such, the discussion of safety-related actuations is no longer valid. In implementing 10CFR50.49, TVA upgraded susceptible safety-related devices located in harsh environments to fully qualified devices. For WBN Unit 2, only fully qualified safety-related devices are installed in areas susceptible to a high energy line break. The non-safety-related device/systems within the scope of IEN 79-22 are:<br><br>1. Steam generator power operated relief valve control system<br>2. Pressurizer power operated relief valve control system<br>3. Main feedwater control system<br>4. Automatic rod control system.<br><br>Failure of these systems/devices due to a high energy line break is fully addressed in Chapter 15, “Accident Analysis” of the WBN Unit 2 FSAR. | 92. Y | Closed<br><br>Response provided. NRC staff to review response.<br><br>See Follow up question 283. | Closed<br><br>OI 283 | EICB RAI No.3 ML102910017, 10/19/10 | TVA Letter dated 7/30/10 | |
| **097** | 7.4.2 | 7.4 | EICB (Darbali) | May 20, 2010<br><br>TVA to review SER Supplement 7 item 7.4.25 deviation on Aux Control Room display of RCS cold leg temperature for applicability to Unit 2. | Date:<br>Responder:<br><br>The deviation to not have RCS cold leg temperature displayed in the Auxiliary Control Room was approved as part of the WBN Unit 1 initial license. WBN Unit 2 complies with the WBN Unit 1 Licensing bases and this deviation is applicable to Unit 2. | 93. Y | Closed<br><br>Response is satisfactory. | Closed | EICB RAI No.4 ML102910017, 10/19/10 | TVA Letter dated 7/30/10 | |
| **098** | 7.4.2 | 7.4 | EICB (Darbali) | May 25, 2010<br><br>Unit 1 SER Supplement 7, RCS Cold Leg Temperature instrumentation. How does Unit 2 address this change? | Date:<br>Responder:<br><br>Refer to the response to Item 13 11 above. | 94. Y | Closed | Closed | EICB RAI No.5 ML102910017, 10/19/10 | TVA Letter dated 7/30/10 | |
| **099** | | | DORL (Bailey) | April 12, 2010<br><br>TVA will provide non-proprietary versions of the following Common Q attached proprietary documents and the affidavits for the proprietary documents by June 30, 2010.<br>1. System Design Specification WNA-DS-01667-WBT, Rev. 1<br>2. System Requirements Specification WNA-DS-01617-WBT, Rev. 1<br>3. Watts Bar 2 - Common Q PAMS ISG-6 Compliance Matrix dated March 4, 2010<br>4. Watts Bar Unit 2 (WBN2) Post Accident Monitoring System (PAMS) Licensing Technical Report LTR-RCPL-10-XX<br>5. Software Requirements Specification WNA-SD-00239-WBT, Rev. 1 | Date:<br>Responder: WEC | 95. Y | Closed | Closed | | | Closed to Item 129 |
| **100** | | | C | 5/20/2010 | Responder: WEC | 96. Y | Closed | Closed | N/A - No question | N/A | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | The following Common Q proprietary documents listed in the response and the affidavits for the proprietary documents will be provided by April 9, 2010.<br>1. System Design Specification WNA-DS-01667-WBT, Rev. 1<br>2. System Requirements Specification WNA-DS-01617-WBT, Rev. 1<br>3. Watts Bar 2 - Common Q PAMS ISG-6 Compliance Matrix dated March 4, 2010<br>4. Watts Bar Unit 2 (WBN2) Post Accident Monitoring System (PAMS) Licensing Technical Report LTR-RCPL-10-XX<br>5. Software Requirements Specification WNA-SD-00239-WBT, Rev. 1 | The documents, and affidavits for withholding for the listed documents were submitted to the NRC on TVA letter to the NRC dated April 8, 2010. | | | | was asked. Item was opened to track commitment made by applicant. | | |
| **101** | | | DORL (Poole) | 4/12/2010<br><br>The non-proprietary versions of the following RM-1000, Containment High Range Post Accident Radiation Monitor documents will be provided by June 30, 2010.<br>1. V&V Report 04508006A<br>2. System Description 04508100-1TM<br>3. Qualification Reports 04508905-QR, 04508905-1 SP, 04508905-2SP, 04508905-3SP<br>4. Functional Testing Report 04507007-1TR | Responder: Slifer<br><br>The documents, and affidavits for withholding for the listed documents were submitted to the NRC on TVA letter to the NRC dated July 15, 2010. | 3. Y | Open<br><br>Documents provided in letter dated 07/15/10 | Open-NRC Review<br><br>Due 10/14/10<br><br>**Confirm receipt.** | N/A | | TVA is working with the vendor to meet the 6/30 date, however there is the potential this will slip to 7/14. |
| **102** | | | EICB (Carte) | May 24, 2010<br><br>Provide a schedule for resolution of items 80, 82 and 83 | Date: 5/24/10<br>Responder: WEC<br><br>Item 80 – no later than July 23, 2010<br><br>Item 82 – no later than July 23, 2010<br><br>Item 83 – no later than July 23, 2010 | 97. Y | Closed | Closed | N/A | TVA Letter dated 6/18/10 | Request for schedule not information. |
| **103** | 7.4 | 7.4 | EICB (Darbali) | 5/27/2010<br><br>TVA to submit excerpts of EDCR 52321 | Responder: Ayala Date: 5/27/10<br><br>Attachment 1 contains excerpts from draft EDCR 52321 (i.e., draft Scope and Intent, Unit Difference and Technical Evaluation). The final excerpts will be submitted within two weeks after issuance of the EDCR. | 98. Y | Closed<br><br>Response is included in letter dated 10/29/10. | Closed<br><br>Due 10/31/10. Waiting for docketed version to close item. | EICB RAI No.1 ML102910017, 10/19/10 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 4 | Submittal date is based on current EDCR scheduled issue date. |
| **104** | 7.4 | 7.4 | EICB (Darbali) | 5/27/2010<br><br>TVA to submit excerpts of EDCR 52351 | Responder: Merten Date: 5/27/10<br><br>Attachment 2 contains excerpts from draft EDCR 52351 (i.e., draft Scope and Intent, Unit Difference and Technical Evaluation). The final excerpts will be submitted within two weeks after issuance of the EDCR. | 99. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 10/31/10. Waiting for docketed version to close item. | EICB RAI No.1 ML102910017, 10/19/10 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 5 | Submittal date is based on current EDCR scheduled issue date. |
| **105** | | | EICB (Garg) | April 29, 2010<br><br>Provide As-Found/As-Left methodology procedure | Date:<br>Responder: Langley<br><br>Submitted copy of TI-28 May 14/2010. | 100. Y | Closed<br><br>Date: 5/27/10<br>Responsibility: NRC<br><br>Replaced with new open item 176. | Closed | N/A | N/A | Will be reviewed under item 154. |
| **106** | | | EICB (Singh) | May 6, 2010<br><br>Confirm that the Unit 1 and Unit 2 CERPI systems utilize the same processor (AC110 or AC160). | Date: 5/25/10<br>Responder: Davies<br><br>Westinghouse Unit 2 Drawing 6D31420, Watts Bar 2- CERPI AC160 Chassis Configuration, Rev. 2, shows the processors are model AC160, which are the same that are | 101. Y | Closed<br><br>Date:<br>Responsibility: | Closed | RAI No. 9 ML102980005 10/26/2010 | TVA Letter dated 6/18/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | utilized for Unit 1, as shown on Westinghouse drawing 2D82995 Rev. 0, Watts Bar CERPI AC 160 Chassis Configuration. | | | | | | |
| **107** | | | EICB (Singh) | May 6, 2010<br><br>Describe any control functions associated with the RM-1000 radiation monitors. | Date: 5/28/10<br>Responder: Clark<br><br>The RM-1000 radiation monitors do not provide any control functions. | 102. Y | Closed<br><br>Requested information provided. NRC to review. | Closed<br><br>See ML101940236, Encl 1, Item 29. | RAI No. 22<br>ML102980005<br>10/26/2010 | TVA Letter dated 6/18/10 | |
| **108** | | | EICB (Garg) | May 6, 2010<br><br>We are requested to docket the fact that the appropriate sections of chapter 7 of the FSAR will be updated to include references to:<br><br>a. TI-28 to address as-found/as-left issues<br>b. RISC 2006-17 | Date: 5/25/10<br>Responder: Webb/Hilmes<br><br>This item is addressed as follows:<br><br>**109.** FSAR Amendment 100 which was submitted on TVA letter to the NRC dated August __, 2010 incorporates as-found and as-left setpoint tolerance discussion into section 7.1.2.1.9, adds EEB-TI-28, Setpoint Methodology to the section 7.1 references and adds a reference to 7.1.2.1.9 to section 7.2.1.1.10.<br><br>2. TSTF-493, Rev. 4 Option A has been incorporated into the Unit 2 Tech Spec submittal dated February 2, 2010. | 103. Y | Closed<br><br>This item is to be worked with item 51. | Closed<br><br>This item is closed as it will be reviewed under item 154. FSAR AMD 100 | N/A | N/A | Will be reviewed under OI#154 |
| **109.b** | | | EICB (Carte) | 5/6/2010<br><br>The reviewer was unable to identify the sections of the FSAR that correspond to the standard review plan sections7.9. | Responder: N/A<br><br>TVA Provided response | 104. Y | Closed<br><br>J. Wiebe accepted this action. | Closed<br><br>NRC Action | N/A | N/A | Duplicate of another open Item. |
| **109.a** | 7.8 | XX | EICB (Darbali) | 5/6/2010<br><br>The reviewer was unable to identify the sections of the FSAR that correspond to the standard review plan sections 7.8. | Responder: N/A<br><br>TVA Provided response | 105. Y | Closed<br><br>J. Wiebe accepted this action. | Closed | N/A | N/A | |
| **110** | | | EICB (Garg) | May 6, 2010<br><br>The reviewer was unable to locate the Eagle 21 WCAPs 12374 and 12375 for review within the NRC records. We agreed to provide the ADAMS numbers for the submittal. | Date:<br>Responder: Clark<br><br>These items were docketed under ML073550386 | 106. Y | Closed | Closed | N/A | N/A | Information was found. |
| **111** | | | EICB (Carte) | May 6, 2010<br><br>The reviewer was unable to locate information (SER) on the plant computer or annunciator systems and asked us to provide the location within the FSAR where these systems are described. | Date: 5/28/10<br>Responder: Clark<br><br>The annunciator system is not described in the WBN Unit 1 UFSAR. As such it is not included in the WBN Unit 2 FSAR.<br><br>With the exception of the ERFDS functions in section 7.5, the plant computer is not described in the WBN Unit 1 UFSAR. As such it is not included in the WBN Unit 2 FSAR. | 107. Y | Closed | Closed | N/A | TVA Letter dated 6/18/10 | Request to help find, not a request for information. |
| **112** | | | EICB (Garg) | June 1, 2010<br><br>What are the differences between the Unit 1 and Unit 2 Eagle 21 Systems? | Date:<br>Responder: Clark<br><br>This information is included in TVA letter dated March 12, 2010, Enclosure 1, Item 10. | 108. Y | Closed | Closed | N/A | N/A | Information was received |
| **113** | | | EICB (Garg) | 6/1/2010<br><br>Are the new model Eagle 21 power supplies installed in Unit 1? | Responder: Clark<br><br>Yes. Attachment 9 provides a work order excerpt and unit difference form. | 109. Y | Closed<br><br>Attachment 9 does not show the vendor and model no. of the | Closed | EICB RAI<br>ML102910008<br>Item #34 | TVA Letter dated 6/18/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Revised attachment provided on 7/30 letter. | | Power Supply. | | | | |
| **114** | 7.2 | 7.2 | EICB (Garg) | 6/1/2010<br><br>Provide the resolution of the Eagle 21 Rack 5 lockup on update issue. | Responder: WEC<br><br>The following non-proprietary response was developed from proprietary Westinghouse letter WBT-D-2027 (Reference 11), which provided the resolution of this issue. Westinghouse approved this non-proprietary response via e-mail from A. Drake to M. Clark on June 15, 2010.<br><br>As documented in WBT-D-1917, "Eagle-21 Rack 5 LCP Diagnostic Failures", (Reference 14), during the factory acceptance testing for the Unit 2 Eagle-21 System, Westinghouse noted an occasional diagnostic failure while performing the parameter update function on Rack 5.<br><br>Subsequently, TVA provided to Westinghouse for testing and examination, a Loop Control Processor (LCP) board removed by TVA from Unit 1 Rack 5 for life cycle-based preventive maintenance. TVA personnel familiar with Unit 1 had indicated they had not experienced problems when performing parameter updates on Unit 1 Rack 5.<br><br>Based on Westinghouse examination and testing, a difference in hardware was identified between the Unit 1 LCP shipped to Westinghouse, the new Unit 2 Rack 5 LCP, and an older LCP (older than the Unit 1 LCP) from the Westinghouse Eagle 21 test bed. Installed on the Unit 1 LCP was a different version of an 80287 math coprocessor chip (80287 XL).<br><br>This version of the 80287 had an improved specification for calculation speed. Use of this chip on both the Unit 2 LCP and the test bed LCP allowed proper performance of the LCP when making parameter updates using the Unit 1/Unit 2 Rack 5 software. Also, use of the slower 80287 on any of the three LCP boards caused failure in parameter update with the Unit 1/Unit 2 Rack 5 software.<br><br>Through investigation of historical records, Westinghouse found that the 80287 XL chip had been evaluated and used by its former Process Control Division (now Emerson) for this application, but the current Westinghouse documentation had not been updated. This part has now been evaluated, and the Westinghouse documentation and drawing have been revised to allow use of the 80287 XL coprocessor. The 80287 XL coprocessor has been installed on the Unit 2 Rack 5 LCP, and the appropriate factory acceptance testing has been successfully conducted using this updated board. Additionally, the LCP boards in the balance of the Unit 2 racks have been updated with the 80287 XL coprocessor.<br><br>**TVA Revised Response:**<br><br>The Eagle 21 system is installed and the Site Acceptance Test has been completed. To the best of TVA's knowledge there are no unknown issues with the system. | 110. Y | Close<br><br>TVA to provide justification that there are no more surprises.<br><br>Revised response is included in letter dated 10/29/10 | Closed<br><br>Due 10/31/10<br><br>The write-up shows that there was differences between Unit 1 and 2 but was not identified to NRC in earlier response. Are there any more surprises like this? | EICB RAI ML102910008 Item#35 | TVA Letter dated 6/18/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item No. 6 | |
| **115** | | | ~~EICB~~ | 2/25/2010 | Responder: Clark | 111. Y | Closed | Closed | EICB RAI | TVA Letter dated | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Provide a list of digital 1E systems that have a digital communications path to non safety related systems and if it has:<br>a. Been reviewed before for unit 1<br>b. Or installed in unit 1 under 50.59, or<br>c. Is unique to unit 2 | Response states that Eagle21 and the CQ PMAS MTP have communications links to non-safety-related systems..<br><br>The original design allowed printing from both the Operator Module (OM) and Maintenance and Test Panel (MTP) via the plant computer. This required both to be connected to the plant computer. Westinghouse did not perceive this as an issue, because the standard Common Q PAMS design includes both the flat panel displays and individual control panel indicators. The Westinghouse Common Q team did not realize that WBN does not use the individual control panel indicators. As a result, the original design documents provided by Westinghouse included the connection from the OM to the plant computer.<br><br>The TVA team did not realize that the Westinghouse design relied on the OM and MTP to be qualified isolation devices that protected the AC160 functions and individual control panel indicators from interference from the plant computer. It was not until a meeting was held with TVA, Westinghouse and Bechtel to discuss the design of the OM that the issues came to light. That was when Westinghouse understood that the OM was the PAMS display and WBN did not use individual control panel indicators and TVA/Bechtel understood that the OM was being credited as the "qualified isolation device". It became apparent at the meeting to both TVA/Bechtel and Westinghouse that the original design was not acceptable. The team then agreed to delete the OM connection to the plant computer. | | Response provided in letter dated 10/5/10<br><br>The CQ PAMS SysRS (WNA-DS-01617-WBT Rev. 1 Figure 2..1-1) shows that the OM has a TCP interface to non-safety. Please provide a list of ALL digital communications paths to non-safety-related systems.<br><br>NNC 8/12/10: The staff pointed out this inconsistency to TVA. The staff could consider PAMS Licensing Technical Report to be a correction if TVA specifically identified the inconsistency to the staff, or identified where the error in the SysRS, SRS, & SDS had already been identified. This appears to be a feature in the CQ TR appendix that was carried forward to WBN2 PAMS inappropriately | | ML102910002 Item No. 17 | 6/18/10<br><br>TVA Letter dated 10/5/10 | |
| **116** | | | EICB (Garg) | 6/3/2010<br><br>The Eagle 21 boards originally had a conformal coating. However, the new boards do not. Provide the basis for deletion of the conformal coating. | Responder: WEC<br><br>The response to this RAI was submitted in TVA letter to the NRC dated June 21, 2010.<br><br>As previously stated the technical reason for the coating "was to ensure performance at high humidity, with the major concern being the effects of humidity on low level analog circuitry". Westinghouse letter (WBT-D-2036, TENNESSEE VALLEY AUTHORITY WATTS BAR NUCLEAR PLANT UNIT 2, Basis for Removal of Conformal Coating Requirement on Eagle 21 Boards (Reference 7) does not credit the conformal coating as addressing the tin whisker issue.<br><br>As addressed in Resolution of Generic Safety Issues: Issue 200: Tin Whiskers (NUREG-0933, Main Report with Supplements 1–33),<br><br>"CONCLUSION<br><br>The low number of reported events associated with this issue, the lack of any increasing trend, the lack of any apparent decrease in reliability of systems or components due to tin whiskers, the existence of applicable regulatory requirements and programs (i.e., 10 CFR Part 21, the maintenance rule requirements, and the Reactor Oversight Program), and the issuance of Information Notice 2005- | 112. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>How is the tin whisker issue is addressed. I think conformal coating was credited to protect against tin whisker issue. | EICB RAI ML102910008 Item # 20 | TVA Letter dated 10/5/10 | Letter sent to Westinghouse requesting the basis information and documentation for submittal to the NRC. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 251878 to alert licensees collectively indicated that tin whiskers did not meet the requirements of NRC Management Directive 6.4. "Generic Issues Program," for further pursuit. Based on the considerations discussed above, RES recommended that the issue be returned to the originator to be evaluated for other possible options. As a result, the issue was DROPPED from further pursuit.1879"<br><br>Based on the preceding NRC position no further discussion of the tin whisker issue is required. | | | | | | |
| **117** | 7.1 | 7.1 | EICB (Garg) | 6/3/2010<br><br>Does TVA use a single sided or double sided methodology for as-found and as-left instrument setpoint values. (RIS2006-7) | Responder: Hilmes<br><br>Reactor Protection System (RPS) (comprised of Reactor Trip (RPS) and Engineered Safety Features Actuation System (ESFAS)) setpoint values are monitored by periodic performance of surveillance tests in accordance with Technical Specification requirements. TVA uses double-sided as-found and as-left tolerances for Reactor Trip and ESFAS trip setpoint surveillance tests as described in FSAR amendment 100.<br><br>**TVA Revised Response:**<br><br>For TSTF-493 parameters WBN Unit 2 uses only double sided correction factors. Attachment 3 contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change. | 113. Y | Closed<br><br>Revised response is included in letter dated 10/29/10 | Closed<br><br>Pending FSAR Amendment 102 submittal<br><br>Due 12/17/10<br><br>TVA needs to address that trip setpoint and allowable value uncertainties are not reduced by the reduction factor for the single sided reduction factor. TVA response not acceptable. TVA need to clarify if single sided methodology has been used in calculating trip setpoint and allowable value and if it is used then provide justifications. | EICB RAI ML102910008 Item#21 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 7 | |
| **118** | 7.4 | 7.4 | EICB (Darbali) | 6/8/2010<br><br>TVA to submit excerpts from EDCR 55385 | Responder: Merten<br><br>Attachment 4 contains excerpts from draft EDCR 55385 (i.e., draft Scope and Intent, Unit Difference and Technical Evaluation). The final excerpts will be submitted within two weeks after issuance of the EDCR. | 114. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 10/31/10. Waiting for docketed version to close item. | EICB RAI No.1 ML102910017, 10/19/10 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 8 | Submittal date is based on current EDCR scheduled issue date. Note: The RVLIS EDCR has been split into two EDCRs. The first EDCR is 52601 (Open Item 91) The second EDCR is 55385. |
| **119** | | | EICB (Singh) | June 10, 2010<br><br>Submit the non-proprietary version of Sorrento/GA software V&V report version 1.1 04508005 and withholding affidavit | Date:<br>Responder:<br><br>Provided 7/15/2010 | 115. Y | Closed<br><br>Date: 07/29/10<br>Responsibility: NRC<br><br>TVA provided the non-proprietary version of V&V report version 1.1 04508005 and the withholding affidavit via TVA letter dated July 15, 2010. | Closed | RAI No. 23 ML102980005 10/26/2010 | TVA Letter dated 7/30/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **120** | | | EICB (Carte) | 5/6/2010<br><br>In reviewing the Maintenance Test Panel (MTP) link to the plant computer, the reviewer noted that the MTP software is not purely one directional in that it does allow low level handshaking to support the communications protocol. M. Merten/S. Hilmes<br><br>a. The reviewer stated that this was a potential concern and requested additional information on how the MTP was protected from feedback from the plant computer.<br><br>b. The reviewer stated that in the Oconee review, it was found that the non-safety related data diode was easier to credit than a software barrier. It was suggested we look at changing our position to credit the data diode provided it provided a physical barrier to feedback. Need OWL Information SAH<br><br>c. During this discussion, the reviewer asked if we had information from Westinghouse that demonstrated the ability of Common Q PAMs to withstand a data storm. A verbal response was that this was required by contract as part of the Factory Acceptance Test and would not be available until the FAT was completed. Need to docket the verbal response and provide a date the information will be available. Believe we stated this in the Tech Report. SAH | Responder: Hilmes/Merten/Costley<br><br>TVA responded by letter dated July 30, 2010 (ML102160349) - See Enclosure 1 Item No. 14: Detailed discussion is provided including technical information on the data diode.<br><br>See Item 85. TVA not crediting the data diode. | 116. Y | Closed<br><br>**NNC 8/9/10:** By letter dated July 30, 2010 (ML102160349) - See Enclosure 1 Item No. 14<br><br>a. TVA stated no new information was found in Westinghouse documentation and that this information would be addressed in the V&V reports, and that the final hardware drawing will be provided. Neither of these two documents will contain the information requested. Please provide a detailed description of the MTP hardware connections and the software that perform the communications.<br><br>b. The information provided indicates that the MTP is connected directly to a non-safety-related Red Hat Linux Server which is then connected to the data diode devices. Please describe the secure development and operational environment of these Red Hat Linux Servers.<br><br>c. The answer is not complete. A chattering node is one of the failure modes of an Ethernet link. The MTP is connected to a Linux server over an Ethernet link. What prevents this link from locking up the MTP by a data storm? | Closed | EICB RAI ML102910002 Item No. 18 | TVA Letter dated 7/30/10 | |
| **121** | | | EICB (Carte) | 5/6/2010<br><br>If not previously provided, provide the requested information in items a, b and c for changes to all platforms between Unit 1 and 2. (Specific request for information on Foxboro IA). D. Webb/H. Webber<br><br>a. Describe the hardware differences between unit 1 and unit 2<br><br>b. Identify which systems have been transferred to the Foxboro Spec 200 system that utilize a different platform in Unit 1.<br><br>c. Identify the functions (ensure all control functions are addressed) that have been transferred to the Foxboro Spec 200 system that utilize a different platform in Unit 1. | Responder: Webb/Webber<br><br>The information in the letter provides references to previous submittals and a cross reference for the Foxboro I/A system. | 117. Y | Closed | Closed | EICB RAI ML102980066 Item No. 1 | TVA Letter dated 7/30/10 | |
| **122** | | | ~ C | June 14, 2010 | Date: | 118. Y | Closed | Closed | N/A - Request for | N/A | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Provide a date for completing the next revision of the Common Q PAMS System Requirements Specification. | Responder: WEC<br><br>This is a duplicate of NRC RAI Matrix Item 50 and is considered closed. | | | | schedule not technical information. | | |
| **123** | 7.7.3 | 7.4.1, 9.3.4.2.4 | EICB (Darbali) | 6/14/2010<br><br>Safety Evaluation(SE) Section 7.7.3 Volume Control Tank Level Control System<br><br>1. Confirm whether or not any Instrumentation & Control (I&C) systems or equipment have been changed in the Volume Control Tank Level Control System.<br><br>2. In the original Safety Evaluation(SE), NUREG-0847 (ML072060490), Section 7.7.3, the staff addressed a concern that was raised by Westinghouse regarding an adverse control and protection system interaction. (…a single random failure in the VCT level control system could cause the letdown flow to be diverted to the liquid holdup tank). Based on your responses to the staff's questions related to this concern, the staff considered the issue resolved. Confirm that your responses are applicable to Unit 2. | Responder:<br><br>1. The devices in the Volume Control Tank Level Control System have been replaced. The Volume Control Tank Level Indication and Control functions have been relocated to the Foxboro IA system. The transmitters and indicators have been replaced with 4-20mA technology and the transmitters have been changed to Rosemount.<br><br>2. Upscale failure of LT-62-129A: Flow is diverted to the holdup tank but makeup continues to maintain level and alarms alert the operator.<br><br>Upscale failure of LT-62-130A: Unlike Unit 1, the makeup control system uses inputs from both LT-62-130A and LT-62-129A. This results in a more robust design that eliminates a single point of failure for LT-62-130A. If transmitter LT-62-130A fails >20mA, the system disregards the input and uses the LT-62-129A signal for control. If transmitter LT-62-130A is high but <20 mA, the deviation between the two causes an alarm, and the diverter valve loop and makeup control both use the last good value of the average. Once the level goes high or low, alarms on LT-62-129A alert the operator to take action to mitigate. | 119. Y | Closed<br><br>Follow up question is to request a logic diagram in OI 284. | Closed | ML101720589, RAIs 21 and 22, 6/25/10 and EICB RAI No.8 ML102910017, 10/19/10 | TVA Letter dated 7/30/10 | |
| **124** | 7.7.5 | XX | EICB (Darbali) | 6/14/2010<br><br>SE Section 7.7.5 IE Information Notice 79-22<br><br>1. In the original SE, Section 7.7.5, the staff determined that Information Notice 79-22 was resolved based on your statement that the control and logic functions of the Watts Bar plant were identical to the Sequoyah plant, thus making the Sequoyah evaluation applicable to Watts Bar. Confirm that your statements regarding the control and logic functions are applicable to Unit 2's control and logic functions or describe any changes and why they are acceptable. | Responder:<br><br>Duplicate of item 96 | 120. Y | Closed | Closed | ML101720589, Item No. 23, 6/25/10 and EICB RAI No. 9 ML102910017, 10/19/10 | TVA Letter dated 7/30/10 | |
| **125** | 7.7.8 | 7.7.1.12 | EICB (Darbali) | 6/14/2010<br><br>SE Section 7.7.8 AMSAC<br><br>1. Confirm whether or not any I&C systems or equipment have been changed in the AMSAC? Describe the changes, if any.<br><br>2. NUREG-0847, Supplement 14 (ML072060486), documents the staffs review of FSAR Amendment 81 that found that the AMSAC automatic initiation signal [to start the turbine-driven and motor-driven AFW pumps] was not added to the logic diagram for the AFW system shown in FSAR Figure 7.3-3, Sheet 2. The issue was resolved in Amendment 88. Confirm that this signal has been incorporated in the Unit 2 drawings. | Responder:<br><br>1. The AMSAC system was not previously installed in Unit 2. EDCR 52408 installs the system. Attachment 3 contains excerpts from the EDCR that describe the Unit 2 system and how it differs from the Unit 1 system.<br><br>2. EDCR 52408 incorporates the AMSAC system into the Unit 2 drawings. | 121. Y | Closed | Closed | ML101720589, Item No.s 24 and 25, 6/25/10 and EICB RAI Nos.10 and 11 ML102910017, 10/19/10 | TVA Letter dated 7/30/10 | |
| **126** | 7.8 | 7.8 | EICB (Darbali) | June 14, 2010<br><br>SE Section 7.8 NUREG-0737 Items | Date:<br>Responder: | 122. Y | Closed | Closed | ML101720589, Item No. 26, 6/25/10 and EICB RAI No.12 | TVA Letter dated 7/30/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1. In the SER Cross Reference To FSAR table (06-25-09), section 7.8.5 'Confirm Existence of Anticipatory Reactor Trip Upon Turbine Trip (II.K.3.12)' has the following scope of change:<br><br>Common Station Service Transformers (CSST) A and B, eight (8) vital inverters vs. four, fifth DG will be removed from FSAR, Double breaker, double breaker scheme of the new Watts Bar 500kV switchyard.<br><br>Is any I&C system or component affected in the scope of this change? | No I&C components or systems are affected by this change. | | | | ML102910017, 10/19/10 | | |
| **127** | 7.2 | 7.2 | EICB (Garg) | 6/16/2010<br><br>Provide the status of the Eagle 21 Rack 2 RTD accuracy issue. | Responder: WEC/Clark<br><br>The following non-proprietary response was developed from proprietary Westinghouse letter WBT-D-2034 (Reference 15), which provided the details of this issue. Westinghouse approved this non-proprietary response via e-mail from A. Drake to M. Clark on June 16, 2010.<br><br>During the Watts Bar Unit 2 Eagle 21 Factory Acceptance Test (FAT) of Rack 2 it was discovered that the narrow range Resistance Temperature Detector (RTD) temperature inputs were consistently reading about 0.2 °F higher than expected. Investigation revealed that these inputs are configured in the Loop Calculation Processor software as a shared RTD. This is incorrect. Rack 2 RTD's are not shared. Racks 6, 10 and 13 RTD's are. Configuration as a shared RTD input alters the equation used for the temperature calculation. Watts Bar Unit 1 uses identical software to Unit 2.<br><br>Further investigation by Westinghouse showed this configuration error causes the Narrow Range Temperatures for only Division I to read 0.2 to 0.27 °F higher over the Narrow Range span of 510-650 °F. The 0.2 °F shift affects Thot and Tcold equally and thus will not affect the indication of Delta T. Tavg will indicate high by 0.2 °F which will decrease the Over temperature and Overpower set points; which is in the conservative direction. | 123. Y | Closed | Closed | EICB RAI ML102910008 Item36 | TVA Letter dated 6/18/10 | |
| **128** | 7.2 | 7.2 | EICB (Garg) | 6/18/2010<br><br>Submit the report on the final resolution of the Eagle 21 Rack 2 RTD input issue | Responder: WEC Drake /TVA Craig<br><br>The Unit 1/Unit 2 Eagle 21 configuration has a sufficient number of spare Narrow Range and Wide Range RTD inputs available on the installed ERI-01 and ERI-02 boards to wire these spare inputs to the active channels. The spare input will provide the parallel resistance to resolve the problem. The Wide Range (WR) RTD inputs provide the same input impedance as the Narrow Range (NR) RTD inputs. Jumpers will be installed at the Eagle 21 termination frame to provide a parallel connection from each existing NR RTD input to an existing spare input, thus simulating the hardware connection for shared RTDs. Therefore, as configured, the Rack 2 Loop Calculation Processor (LCP) would provide the correct temperature calculation for the NR RTDs. | 124. Y | Closed<br><br>Response is included in letter dated 10/29/10<br><br>Has it been tested to show that the revised config. Provide the needed accuracy. | Closed<br><br>**Due 10/31/10** | EICB RAI ML102910008 Item46 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 9 | Track through SE open item |
| **129** | | | RL (P | 6/12/2010 | Responder: WEC | 125. Y | Closed | Closed | N/A | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TVA will provide non-proprietary versions of the following Common Q attached proprietary documents and the affidavits for the proprietary documents by June 30, 2010.<br>1. System Design Specification WNA-DS-01667-WBT, Rev. 1<br>2. System Requirements Specification WNA-DS-01617-WBT, Rev. 1<br>3. Software Requirements Specification WNA-SD-00239-WBT, Rev. 1 | The documents, and affidavits for withholding for the listed documents were submitted to the NRC on TVA letter to the NRC dated July 14, 2010. | | Response provided in letter dated 10/5/10 | Confirmation by 10/14/108 | | | |
| **130** | | | DORL (Poole) | 6/28/2010<br><br>TVA committed to revise in Amendment 100: table 4.3-1 to add ID and OD nomenclature to thimble guide tube dimensions . | Responder: Clark<br><br>FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1, 2010 added the ID and OD nomenclature. | 126. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>Confirmation by 10/14/10 | N/A | TVA Letter dated 10/5/10 | |
| **131** | | | DORL (Poole) | 6/28/2010<br><br>TVA committed to revise in Amendment 100: FSAR 3.10 references to eliminate (LATER) for document numbers. | Responder: Clark<br><br>FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1, 2010 updated the reference document number information. | 127. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>Confirmation by 10/14/10 | N/A | TVA Letter dated 10/5/10 | |
| **132** | | | DORL (Poole) | 6/28/2010<br><br>TVA committed to revise in Amendment 100: FSAR 3.10 to correct differences between the list on page 3.10-4 and the numbering referenced by the text below the list. | Responder: Clark<br><br>FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1, 2010 corrected the numbering in the text. | 128. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>Confirmation by 10/14/10 | N/A | TVA Letter dated 10/5/10 | |
| **133** | | | DORL (Poole) | 6/28/2010<br><br>TVA committed to revise in Amendment 100: FSAR 3.10 to remove references to IEEE 344-1987. | Responder: Clark<br><br>FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1, 2010 removed the reference to IEEE 344-1987. | 129. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>Confirmation by 10/14/10 | | TVA Letter dated 10/5/10 | |
| **134** | | | DORL (Poole) | 6/28/2010<br><br>TVA committed to revise in Amendment 100: FSAR Table 1.3-3 to reflect modifications to WBN2 . | Responder: Clark<br><br>FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1 2010 updated the table to reflect the WBN2 modifications. | 130. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>Confirmation by 10/14/10 | | TVA Letter dated 10/5/10 | |
| **135** | 7.3.1 | 7.3.1 | EICB (Darbali) | 6/30/2010<br><br>TVA committed to add in Amendment 100 a reference to 7.3.1.1.1 in 6.2.5.2.b. | Responder: Clark<br><br>FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated Sept 1, 2010 added the reference. | 131. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>Amendment 100 received. | Closed | RAI not necessary because this item was originated by TVA | TVA Letter dated 10/5/10, item 27 | |
| **136** | 7.3.2, 7.4 | 7.4, 5.6, 6.3.5 | EICB (Darbali) | 6/30/2010<br><br>TVA committed to replace in Amendment 100 the terms "service water" and "emergency raw cooling water" where they are used incorrectly with "Essential Raw Cooling Water" in sections 7.4, 6.2.1, Table 3.7-25, Table 9.3-3, Table 15.4-14, 1.9.2.7, 7.3.2.2.5 and 11.2.4. | Responder: Clark<br><br>FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated Sept 1, 2010 updated the "service water" and "emergency raw cooling water" nomenclature as required to read essential raw cooling water. | 132. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>Amendment 100 received. | Closed | RAI not necessary because this item was originated by TVA | TVA Letter dated 10/5/10, item 28 | |
| **137** | | | EICB (Carte) | Several WBN2 PAMS documents contain a table titled, "Document Traceability & Compliance."<br><br>(a) Please explain the purpose of this table.<br><br>(b) Please describe how this table is different than a reference list.<br><br>(c) What does it mean for a document to be listed in this table? | Responder: WEC<br><br>(a) The table is to show the document hierarchy (i.e., what documents are predecessors to the document in relationship to the design life cycle).<br><br>(b) This table is showing a hierarchical relationship between documents. These documents are also in the reference list along with other documents that have no hierarchical | 133. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>Carte accepted this response 9/1 | Closed | ML101650255, Item No. 1 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | relationship with the document.<br><br>(c) This question is similar to (a). It is to identify the documents that are predecessors to this document in relationship to the design life cycle. | | | | | | |
| **138** | | | EICB (Carte) | By letter dated February 3, 2010, Westinghouse informed TVA that certain PAMS documentation has been completed.<br><br>(a) The draft ISG6 states that a commercial grade dedication plan should be provided with an application for a Tier 2 review.<br><br>By letter dated February 5, 2010, TVA stated that the commercial grade dedication plan was included in the Common Q Topical Report Section 11, "Commercial Grade Dedication Program." Section 11 includes a description of the Common Q Commercial Grade Dedication Program, and states: "A detailed review plan is developed for each Common Q hardware or software component that requires commercial grade dedication."<br><br>Please provide the commercial grade dedication plans for each Common Q hardware or software component that has not been previously reviewed and approved by the NRC.<br><br>(b) The draft ISG6 states that a commercial grade dedication report should be provided within 12 months of requested approval for a Tier 2 review.<br><br>(i) Please provide 00000-ICE-37722 Rev. 0, "Commercial Grade Dedication Report for the QNX Operating System for Common Q Applications."<br><br>(ii) Please provide WNA-CD-00018-GEN Rev. 3, "Commercial Dedication Report for QNX 4.25G for Common Q Applications." | Responder: WEC<br><br>**<u>This item is used to track all Commercial Grade Dedication issues.</u>**<br><br>a. WNA-LI-00058-WT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1) contains the following changes to address the NRC request:<br><br>Section 7, "Commercial Grade Dedication Process" has been revised to describe the general commercial grade dedication process for both hardware and software and uses a description of the AI687 dedication process as an example of how the process is applied.<br><br>As listed in Table 6-3. "Westinghouse Watts Bar 2 Common Q PAMS Documents at Westinghouse Rockville Office, the following commercial grade dedication documents are available for NRC audit at the Westinghouse Rockville office: (list included in letter)<br><br>b. It is TVA's understanding that the submittal of the documents listed in (b.i) and (b.ii) is no longer required. Rather, it was agreed, that the inclusion of a description of the commercial grade dedication process in revision 2 of the Post-Accident Monitoring System (PAMS) Licensing Technical Report, WNA-LI-00058-WT-P, would be sufficient to address this request. | 4. N | Open<br><br>Revised response included in letter dated 12/22/10<br><br>TVA agreed to include a description of the generic Westinghouse <u>hardware</u> commercial grade dedication process in the PAMS licensing technical report. (see ML102920031 Item No 1)<br><br>TVA agreed to include (in the PAMS licensing technical report) an evaluation of WBN2 critical characteristics for commercial Westinghouse <u>hardware</u> components against the generic critical characteristics. (see ML102920031 Item No 2)<br><br>TVA agreed to include a description of the generic Westinghouse <u>software</u> commercial grade dedication process in the PAMS licensing technical report. (see ML102920031 Item No 3)<br><br>TVA agreed to include (in the PAMS licensing technical report) an evaluation of WBN2 critical characteristics for commercial <u>software</u> components against the generic critical characteristics. (see ML102920031 Item No 4) | Open-NRC Review<br><br>**NNC 2/2/11:** Commercial grade dedication will be addressed at the next audit. | ML101650255, Item No. 2 | | |
| **139** | | | EICB (Carte) | The WBN2 PAMS System Requirements Specification (WBN2 PAMS SysRS) contains a table (see page iii) titled, "Document Traceability & Compliance," which states that the WBN2 PAMS SysRS was created to support no documents. Please explain. | Responder: WEC<br><br>The table is to show the document hierarchy (i.e., what documents are predecessors to the document in relationship to the design life cycle). The table purpose is to provide references to internal Westinghouse documents and is not intended to reference TVA documents. | 134. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | ML101650255, Item No. 3 | TVA Letter dated 10/5/10 | WBN2 PAMS System Requirements Specification<br><br>TVA docketed WNA-DS-01617-WBT Rev. 1, "RRAS Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System- System Requirements Specification," dated December 2009. |
| **140** | | | EICB (Carte) | The first requirement in the WBN2 PAMS SysRS (i.e., R2.2-1) states: "The PAMS shall be capable of operation during normal and abnormal environments and plant operating modes." The rational for this requirement is that it is necessary to meet Regulatory Guide (RG) 1.97. | Responder: Clark<br><br>WBN Unit 2 FSAR Amendment 100 Section 7.5.1.8, "Post Accident Monitoring System (PAMS)" specifies the Reg. Guide 1.97 variables implemented in the Common Q based | 135. N | Closed<br><br>Revised response included in letter dated 12/22/10 | Closed<br><br>**NNC 2/3/11:** This item is addressed by:<br>(1) WNA-LI-00058- | ML101650255, Item No. 4 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 10 | WBN2 PAMS System Requirements Specification<br><br>TVA docketed WNA-DS-01617-WBT Rev. 1, "RRAS Watts Bar 2 NSSS |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | What document specifies which RG 1.97 variables are implemented in the Common Q based WBN2 PAMS? | WBN Unit 2 PAMS<br><br>**TVA Response to Follow-up NRC Request:**<br><br>WNA-LI-00058-WT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" was submitted in TVA Letter to NRC, dated December 3, 2010 (Reference 1). Revision 2 contains the following change to address this request:<br><br>Section 11, "TVA Contract Compliance Matrix" has been added. Specifically the items of concern are addressed by Requirements 7 through 19 (pages 11-1 and 11-2). | | **NNC 11/3/10:** The origin of the requirements in the SysRS are not clearly document. Rev. 1 of the Common Q PAMS Licensing Technical Report contains an open item that will be addressed in Rev. 2; this open item is to include "TVA's enhanced contract compliance matrix". It is expected that this matrix will address this open item. | WBT-P Rev. 2 Section 11<br>(2) Attachment 1 to TVA letter dated Octobr 21, 2010. | | | Completion Program I&C Projects Post Accident Monitoring System- System Requirements Specification," dated December 2009. |
| **141** | | | EICB (Carte) | Deleted by DORL | Date:<br>Responder: | 136. Y | Closed | Closed | ML101650255, Item No. 5 | | WBN2 PAMS System Requirements Specification<br><br>TVA docketed WNA-DS-01617-WBT Rev. 1, "RRAS Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System- System Requirements Specification," dated December 2009. |
| **142** | | | EICB (Carte) | The applicable regulatory guidance for reviewing the WBN2 PAMS SysRS would be IEEE 830 as endorsed by Regulatory Guide 1.172 and BTP 7-14 Section B.3.3.1, Requirements Activities – Software Requirements Specifications." IEEE 830-1994 Section 4.3.8, "Traceable," states: "A [requirements specification] is traceable of the origin of each of its requirements is clear…"<br><br>1. How did TVA ensure the traceability of each requirement in the WBN2 PAMS SysRS.<br><br>2. Explain the source(s) of the requirements present in the Post Accident Monitoring System's Software Requirements Specification. To clarify, many documents have requirements that are incorporated by reference into the SRS, but what served to direct the author to include those various documents in the SRS or, if the requirement is based on the System Requirements Specification, what directed the author to include the requirement there? | Responder: WEC<br><br>**This item is used to track all traceability issues with the Software Requirements Specification (SRS).**<br><br>**TVA Response to 1:**<br>Traceability of requirements for the WBN Unit 2 Common Q PAMS is ensured by:<br>**a.** Preparation of the TVA Contract Compliance Matrix contained in WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010 (Reference 1).<br>**b.** Engineering review/comment/status of each revision of:<br>**i.** WNA-DS-01617-WBT, "Post Accident Monitoring System - System Requirements Specification"<br>**ii.** WNA-DS-01667-WBT, "Post Accident Monitoring System – System Design Specification" (hardware)<br>**iii.** WNA-SD-00239-WBT, "Software Requirements Specification for the Post Accident Monitoring System" (software)<br><br>**TVA Response to 2:**<br>As documented in the RTM, some software requirements are taken from generic documents. The decision to include generic software requirements was to reduce the overall scope for Common Q features that are unchanged across projects. Westinghouse reviewed the generic PAMS requirements and included those requirements that were applicable to WBN Unit 2 PAMS.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 | 8. N | Open<br><br>Response included in letter dated 12/22/10<br><br>TVA/Westinghouse agreed to include the V&V evaluation of their reusable software element development process in the V&V design phase summary report. This evaluation would include an evaluation against the development process requirements. This evaluation would also include an evaluation of how the WBN2 specific requirements were addressed by the reusable software elements. (see ML102920031 Item No 5) | Open-TVA/WEC<br><br>Due 2/25/11 (document submittals)<br><br>**NNC 2/2/11:** Updated Specifications and RTMs to be provided by TVA<br><br>Tracability to be addressed during the next audit. | ML101650255, Item No. 6 | | WBN2 PAMS System Requirements Specification<br><br>TVA docketed WNA-DS-01617-WBT Rev. 1, "RRAS Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System- System Requirements Specification," dated December 2009. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | letter review, dated December 17, 2010 (Reference 13) | | | | | | |
| | | | | 3. Clarify whether the unnumbered paragraphs in the Post Accident Monitoring System's Software Requirements Specification, such as in the section headings, or are all such sections simply considered to be informative?<br><br>Does the same apply to documents referenced by the SRS? Such as WCAP-16096-NP-A, Rev. 1A, "Software Program Manual for Common Q Systems," which is incorporated by reference in requirement R2.3-2 in the SRS.<br><br>R2.3-2 [The PAMS software shall comply with the requirements and guidelines defined in WCAP-16096-NP-A, "Software Program Manual for Common Q Systems" (reference 5).]<br><br>If any requirements are expressed in such unnumbered paragraph form instead of individually identified requirements, please list them, describe why they satisfy the fundamental requirement of unambiguity, and describe how they were verified. | **TVA Response to 3:**<br>Unnumbered paragraphs in the Post Accident Monitoring System's Software Requirements Specification, such as in the section headings, are informative and are not to be interpreted as requirements. All requirements are explicitly numbered.<br><br>It depends on the document type. The statement would be true for requirements documents (such as the SysRS or SDS) if they were incorporated by reference. However, for the specific item cited, WCAP-16096-NP-A, Rev. 1A, it does not contain numbered requirements. The requirements contained in this document are contained within the text of the various sections.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) | | | | | | |
| | | | | 4. Are there any sources of requirements in parallel with the Post Accident Monitoring System's Software Requirements Specification? Meaning does the SRS contain, explicitly or by reference, all the requirements that were used in the design phase for the application specific software, or do software design phase activities use requirements found in any other source or document? If so, what are these sources or documents? | **TVA Response to 4:**<br>The Westinghouse SRS, WNA-SD-00239-WBT, Revision 3 contains references to other Westinghouse software requirements documents. Specifically,<br><br>00000-ICE-3238, Revision 5, "Software Requirements Specification Post Accident Monitoring System"<br><br>00000-ICE-3239, Revision 13, "Software Requirements Specification for the Common Q Generic Flat Panel Display Software"<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) | | | | | | |
| | | | | 5. References 12, 27, 29, and 31-44 in the Post Accident Monitoring System's Software Requirements Specification are various types of "…Reusable Software Element…".<br><br>These references are used in the body of the SRS, for example:"<br><br>R5.3.14-2 [The Addressable Constants CRC error signal shall be TRUE when any CAL CRC's respective ERROR terminal = TRUE (WNA-DS-00315-GEN, "Reusable Software Element Document CRC for Calibration Data" [Reference 12]).]<br><br>They are also included via tables such as found in requirement R7.1.2-1<br><br>[The Watts Bar 2 PAMS shall use the application-specific type circuits and custom PC elements listed in Table 7.1-1.] | **TVA Response to 5:**<br>Requirements for the reusable software elements (RSEDs) are evaluated in WNA-VR-00283-WBT-P, Revision 3, "IV&V Summary Report for the Post Accident Monitoring System," dated December 2010 (Attachment 10).<br><br>RSED traceability is contained in WNA-VR-00280-WBT, Revision 2, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Reactor Vessel Level Indication System (RVLIS) Custom PC Elements." This document can be made available for audit at the Westinghouse Rockville office.<br><br>*At the September 15 public meeting in Rockville, the following actions were agreed to. These items address the traceability concerns with the Software Requirements Specification.*<br>*1. Westinghouse will perform a review of the Requirements Traceability Matrix(RTM), using the issues identified at the 9/15 public meeting as a guide (documented below) and update the RTM as required.* | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Do the referenced reusable software element documents include requirements not explicitly stated in the SRS? If so what is their origin? | **TVA Response:**<br>See response to letter Item 13 (NRC Matrix Item 145).<br><br>2. *The next issue of the IV&V report will include the Requirements phase review of the RTM and a partial review for the Design phase.*<br><br>**TVA Response:**<br>See response to letter Item 13 (NRC Matrix Item 145).<br><br>3. *Westinghouse will add a comments column in the Requirements Traceability Matrix (RTM) to address items not in the SRS or SysRS.*<br><br>**TVA Response:**<br>A comments column has been added to WNA-VR-00279-WBT, Revision 3, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Post Accident Monitoring System."<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)<br><br>4. *IEEE 830 says you shouldn't have planning information in the SRS. Westinghouse has agreed to remove this information.*<br><br>**TVA Response:**<br>Westinghouse has confirmed that process requirements have been removed from the SRS.<br><br>Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: Common Q RAI concerns, dated December 8, 2010 (Reference 17)<br><br>5. *IEEE 830 says you shouldn't have process requirements in the SRS. Westinghouse has agreed to remove these requirements.*<br><br>**TVA Response:**<br>Westinghouse confirmed that process requirements have been removed from the SRS.<br><br>Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: Common Q RAI concerns, dated December 8, 2010 (Reference 17)<br><br>6. *Westinghouse will perform and document an evaluation of the SRS to ensure compliance with Reg. Guide 1.172 and justify any deviations.*<br><br>**TVA Response:**<br>WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1): | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Section 9, "Compliance Evaluation Of The Watts Bar 2 PAMS Software Requirements Specification To IEEE Standard 830-1998 And Regulatory Guide 1.172" has been added.<br><br>7. *25 issues identified by V&V where some requirements have not been included in the System Design Specification (SDS) (14) and SRS (11) at the revisions reviewed by V&V. Have these been addressed?*<br><br>**TVA Response:**<br>The twenty-five (25) issues are captured in Exception Reports (ERs): V&V-769 and V&V-770. These ERs have all been addressed and the ERs have been closed satisfactorily by Westinghouse IV&V.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)<br><br>8. *Some hardware requirements are contained in the SRS instead of the System Design Specification (SDS). These will be removed from the SRS and incorporated into the next revision of the SDS.*<br><br>**TVA Response:**<br>The hardware requirements in the Software Requirements Specification have been deleted and moved to System Design Specification.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 16, 2010 (Reference 15)<br><br>9. *RTM item R4.2-2 protection class software set to 0. Needs to be fixed internally. Write CAPs to revise the application restrictions document on AC160.*<br><br>**TVA Response:**<br>Westinghouse CAPs IR# 10-259-M034 has been issued. This item will be addressed in revision 4 of the RTM.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)<br><br>10. *Westinghouse to improve the traceability of the tests that are performed with the function enable (FE) switch in the "ENABLE" position.*<br><br>**TVA Response:**<br>The tests that are performed with the FE keyswitch in the ENABLE position are defined in the SRS Sections: 6.2 "Manually Initiated Testing," 7.2.23 "Annunciator Test Display," 7.2.25 "Saturation Margin Test Display," and 7.2.26 "Analog Output Test Display."<br><br>11. *Westinghouse to revise documents to be consistent* | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *with referring to the FE switch in the "ENABLE" position.*<br><br>**TVA Response:**<br>Westinghouse has elected to standardize on the terms "FE keyswitch" and "ENABLE." A review of recent documents for compliance with this comment and commitment was performed with the following results:<br>*a.* Revision 3 of the SysRS, and SDS have been revised to use the terms "FE keyswitch." Revision 3 of the SDS is consistent in use of the term "ENABLE."<br>*b.* SysRS Revision 3 is not consistent in use of the term "ENABLE" as noted below:<br>*i.* R2.5.2.1-2 uses the term "ENABLED" instead of "ENABLE"<br>*ii.* R2.5.2.1.3-3, R2.6.3.3-1, R2.6.3.3-2, R2.6.3.3-3, and R2.6.3.3-7, use the term "Enable" instead of "ENABLE"<br>*c.* Revision 3 of the SRS is not consistent in use of the terms "FE keyswitch" and "ENABLE" as noted below:<br>*i.* Tables 7.2-1 "Train A PAMS Data Transmitted to the Plant Computer" and 7.2-2 "Train B PAMS Data Transmitted to the Plant Computer" items 101 and 102 in the SRS refer to the FE switch. All other items in the SRS refer to the FE keyswitch.<br>*ii.* Section 2.1, page 2-4, uses the term "Enable" instead of "ENABLE"<br>*iii.* Requirements R7.2.14-6 and R7.2.16-7 use the term "active" instead of "ENABLE"<br>*iv.* Requirements R7.2.23-2, R7.2.25-2, R7.2.26-2, R7.2.31-4, 7.2.56 FPDS Availability, and R7.2.57-4 use the term "enabled" instead of "ENABLE"<br>*d.* WNA-AR-00180-WBT-P, Revision 0, "Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System," dated October 2010, submitted in TVA letter to NRC dated (Reference 12) is not consistent in use of the term "FE keyswitch" as noted below:<br>*i.* Section 2.2 "System Description" and Table 3-1 "WB2 PAMS FMEA" refer to the FE switch.<br>*ii.* Table 3-1 describes the switch as the "Functional Enable (FE) switch" and the "FE key-switch"<br>*e.* Revision 2 of the Licensing Technical Report is not consistent in use of the term "FE keyswitch" as noted below:<br>*i.* Sections 2.2, 5.3 use the term (FE) keylock switch on pages 2-3 (2 places), page 5-3, page 5-6 (4 places)<br><br>The identified discrepancies in the use of the terms "FE keyswitch" and "ENABLE" in the SysRS, SRS, FMEA and Licensing Technical Report, will be corrected in the next revision of the documents. | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 12. *The flow of information is from the SysRS to the SDS (hardware) and SRS (software). Describe how the documents are used. Describe in 1.1 of the SysRS. Need a good write up of how the process works.*<br><br>**TVA Response:**<br>See response to letter item 13 (NRC Matrix Item 145).<br><br>13. *Westinghouse and TVA will develop a revised schedule for document submittals and provide it to the NRC no later than 9/30/10*<br><br>**TVA Response:**<br>The revised document submittal schedule was included as item 3 NRC Request (Matrix Item Number 142, TVA Commitments Nos. 10 and 17) in TVA letter to NRC dated October 26, 2010 (Reference 5).<br><br>14. *TVA will update the Procurement Requisition Resolution Matrix and submit it to show how the Common Q PAMS design meets the contract requirements.*<br><br>**TVA Response:**<br>The Procurement Requisition Resolution Matrix has been updated and is included in WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1), as Section 11, "TVA Contract Compliance Matrix."<br><br>15. *Westinghouse to add the Software Design Descriptions to the RTM*<br><br>**TVA Response:**<br>The Software Design Description documents were added to the RTM in WNA-VR-00279-WBT, Rev 2.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)<br><br>16. *Westinghouse to clarify how requirements or documents are incorporated by reference into the Common Q PAMS requirements.*<br><br>**TVA Response:**<br>When a Common Q PAMS requirements document references a section of another document, all requirements in that section are applicable.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)<br><br>17. *Westinghouse to review the use of "shall" outside of numbered paragraphs in requirements documents to ensure that all requirements are captured and clearly identified.* | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **TVA Response:**<br>See response in letter dated December 22, 2010, item 2 (NRC Matrix Item 050).<br><br>18. *Westinghouse to resolve the following questions concerning Software Design Descriptions (SDDs)*<br><br>a. *Is the SDD a standalone document or will it incorporate the generic SDD by reference?*<br><br>b. *What are the SDDs?*<br><br>c. *PAMS is a delta document so how do we capture all the generic requirements for traceability.*<br><br>**TVA Response:**<br>a. There are three SDDs prepared specifically for the Watts Bar 2 PAMS project. These are listed below in Item b. These documents and superior requirements documents refer to other generic SDDs also listed in Item b.<br><br>b. The SDDs developed for this project are:<br>i. WNA-SD-00248-WBT, Revision 1, "Watts Bar 2 NSSS Completion Program I&C Projects Software Design Description for the Post Accident Monitoring System Flat Panel Display"<br>ii. WNA-SD-00250-WBT, Revision 1, "Watts Bar 2 NSSS Completion Program I&C Projects Software Design Description for the Post Accident Monitoring System AC160 Software"<br>iii. WNA-SD-00277-WBT, Revision 2, "Watts Bar 2 NSSS Completion Program I&C Projects Software Design Description for the Post Accident Monitoring System Flat Panel Display System Screen Design Details"<br><br>iv. Other generic SDDs referenced by the PAMS project are:<br>(a) 00000-ICE-20157, Revision 18, "Software Design Description for the Common Q Generic Flat-Panel Software"<br><br>(b) 00000-ICE-30152, Revision 5, "Software Design Description Post Accident Monitoring System AC160"<br><br>(c) 00000-ICE-30140, Revision 4, "Software Design Description for the Common Q Core Protection Calculator System Database and Utility Functions"<br><br>c. Refer to WNA-VR-00279-WBT, Revision 3.<br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | letter review, dated December 17, 2010 (Reference 13)<br><br>19. *For Reusable Software Elements, Westinghouse to describe as qualified libraries by following the SPM and qualified using the Software Elements Test procedure under Appendix B program. Provide a summary of RSEDs generic WCAP. Westinghouse to determine if the WCAP was docketed under the AP1000. RSED concept is not in the SPM. WCAP-15927 AP-1000 does not discuss RCEDs. WCAP process was acceptable.* RSEDs are listed in the SDD References.<br><br>**TVA Response:**<br>Section 3.2.4.1 of WCAP-15927 describes the RSED design process for custom PC elements and type circuits. The Glossary of Terms in the SPM defines custom PC elements and type circuits as modules. Therefore, the relationship between WCAP-15927 describing the RSED process as circuits, is defined in the SPM requirements for software module development.<br><br>WCAP-15927 is on the AP1000 docket.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)<br><br>**TVA Response to Follow-up NRC Request:**<br><br>WNA-VR-00279-WBT, Revision 4, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Post Accident Monitoring System" is scheduled to be available for audit at the Westinghouse Rockville office February 21, 2011. The document will be available at the Westinghouse Cranberry offices to support the NRC Common Q PAMS audit.<br><br>Attachment 9 contains the proprietary version of WNA-DS-01617-WBT-P, Revision 4, "Post Accident Monitoring System - System Requirements Specification," dated February 2011. Attachment 10 contains the non-proprietary version WNA-DS-01617-WBT-NP, Revision 4, "Post Accident Monitoring System - System Requirements Specification," dated February, 2011. Attachment 11 contains the Application for Withholding Proprietary Information from Public Disclosure, WNA-DS-01617-WBT-P, Revision 4, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Post Accident Monitoring System - System Requirements Specification" (Proprietary), dated February 10, 2011.<br><br>Attachment 12 contains the proprietary version of WNA-DS-01667-WBT-P, Revision 4, "Post Accident Monitoring System – System Design Specification," dated February 2011. Attachment 13 contains the non-proprietary version WNA-DS-01667-WBT-NP, Revision 4, "Post Accident Monitoring System – System Design Specification," dated February 2011. Attachment 14 contains the Application for | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Withholding Proprietary Information from Public Disclosure, WNA-DS-01667-WBT-P, Revision 4, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System - System Design Specification" (Proprietary), dated February 11, 2011.<br><br>Attachment 15 contains the proprietary version of WNA-SD-00239-WBT-P, Revision 4, "Software Requirements Specification for the Post Accident Monitoring System," dated February 2011. Attachment 16 contains the non-proprietary version WNA-SD-00239-WBT-NP, Revision 4, "Software Requirements Specification for the Post Accident Monitoring System," dated February 2011. Attachment 17 contains the Application for Withholding Proprietary Information from Public Disclosure, WNA-SD-00239-WBT-P, Revision 4, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Software Requirements Specification for the Post Accident Monitoring System" (Proprietary), dated February 10, 2011.<br><br>Attachment 18 contains the proprietary version of WNA-AR-00180-WBT-P, Revision 1, "Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System" dated February 2011. Attachment 19 contains the non-proprietary version WNA-AR-00180-WBT-NP, Revision 1, "Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System" dated February 2011. Attachment 20 contains the Application for Withholding Proprietary Information from Public Disclosure, WNA-AR-00180-WBT, Rev. 1, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System" (Proprietary) dated February 14, 2011. | | | | | | |
| **143** | | | EICB (Carte) | The WBN2 PAMS Software Requirements Specification (WBN2 PAMS SRS – ML101050202) contains a table (see page iii) titled, "Document Traceability & Compliance," which states that the WBN2 PAMS SRS was created to support the three documents identified (one of which is the WBN2 PAMS SysRS). Section 1.1, "Overview," of the WBN2 PAMS SRS states: "This document describes requirements for the major software components …"<br><br>(a) Please list and describe each of the "major software components". Please include a description of any NRC review for each of these components.<br><br>(b) Please list and describe each of the other software components. Please include a description of any NRC review for each of these components.<br><br>(c) What other documents contain the requirements for the other software components?<br><br>The WBN2 PAMS System Design Specification (WBN2 PAMS SDS) contains a table (see page iii) titled, "Document Traceability & Compliance," which states that the WBN2 PAMS SysRS was created to support the WBN2 PAMS SysRS. Section 1.1, "Purpose," of the WBN2 PAMS SDS states: "The purpose of this document is to define the hardware design requirements …" | Responder: WEC<br><br>Addressed in the 9/15 public meeting and 9/20 - 9/21 audit. A detailed explanation will be provided.<br><br>**TVA Response:**<br><br>(a) and (b) The requested information is provided in the following documents:<br>i. WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Table 6-1, "Document Requirements" which lists the software documentation requirements for the Common Q PAMS and Section 11 "TVA Contract Compliance Matrix" submitted in TVA Letter to NRC, dated December 3, 2010 (Reference 1).<br>ii. WNA-DS-01617-WBT-P, Revision 3, "Post Accident Monitoring System- System Requirements Specification," dated December 2010 (Attachment 1)<br>iii. WNA-SD-00239-WBT-P, Revision 3, "Software Requirements Specification for the Post Accident Monitoring System," dated December 2010 (Attachment 7) | 9. N | Open<br><br>Response included in letter dated 12/22/10 | Open-TVA/WEC<br><br>Due 2/25/11 (document submittals)<br><br>To be addressed by Revision of the RTM, SRS, SysRS, and SysDS.<br><br>**NNC 2/2/11:** Updated Specifications and RTMs to be provided by TVA<br><br>**NNC 2/3/11:** The above due date has been **missed by at least 2 months.** Please provide new due date. | ML101650255, Item No. 7 | | WBN2 PAMS System Requirements Specification<br><br>TVA docketed WNA-DS-01617-WBT Rev. 1, "RRAS Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System- System Requirements Specification," dated December 2009. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (c) Do the WBN2 PAMS SRS and SDS, together, implement all of the requirements in the WBN2 PAMS SysRS?<br><br>(e) Please briefly describe all of the documents that implement the WBN2 PAMS SysRS. | iv. WNA-VR-00279-WBT, Revision 3, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Post Accident Monitoring System" (available for NRC audit at the Westinghouse Rockville office)<br>To the best of TVA's knowledge, no prior NRC review of the software components has been performed.<br>(c) WNA-VR-00280-WBT, Revision 2, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Reactor Vessel Level Indication System (RVLIS) Custom PC Elements" (available for NRC audit at the Westinghouse Rockville office)<br>(d) No. Please see Item (e) below.<br>(e) The documents that describe the requirements that implement the WBN Unit 2 SysRS are:<br>i. WNA-VR-00279-WBT, Revision 3, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Post Accident Monitoring System" (available for NRC audit at the Westinghouse Rockville office)<br>ii. WNA-VR-00280-WBT, Revision 2, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Reactor Vessel Level Indication System (RVLIS) Custom PC Elements" (available for NRC audit at the Westinghouse Rockville office)<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)<br><br>**TVA Response to Follow-up NRC Request:**<br><br>See Response to item 4 (Item number 142) | | | | | | |
| **144** | | | EICB (Carte) | The WBN2 PAMS Software Requirements Specification (WBN2 PAMS SRS) contains a table (see page iii) titled, "Document Traceability & Compliance," which states that the WBN2 PAMS SRS was created to support the three documents identified (two of these documents have been provided on the docket).<br><br>(a) Please describe the third document (i.e., NABU-DP-00014-GEN Revision 2, "Design Process for Common Q Safety Systems").<br><br>(b) Please describe the flow of information between these three documents.<br><br>(c) Does the PAMS SRS implement the requirements in these three documents?<br><br>(d) Please describe if and how these three documents are used in the development of the PAMS Software Design Description.<br><br>(e) Do the WBN2 V&V activities include verification that the requirements of these three documents have been incorporated into the WBN2 PAMS SRS. | Responder: WEC<br><br>(a) The purpose of NABU-DP-00014-GEN document is to define the process for system level design, software design and implementation, and hardware design and implementation for Common Q safety system development. This document supplements the Common Q SPM, WCAP-16096-NP-A. The scope of NABU-DP-00014-GEN includes the design and implementation processes for the application development. For a fuller description of the design process described in NABU-DP-00014-GEN please refer to the Design Process for AP1000 Common Q Safety Systems, WCAP-15927 on the AP1000 docket. Since this is a Westinghouse process document that is not specifically referenced in the SRS, it will be removed in the next revision of the document.<br><br>(b) – Closed to items 142 and 145<br><br>(c) – Closed 142<br><br>(d) – Closed to Item 142 | 10. N | Open<br><br>Revised response included in letter dated 12/22/10<br><br>Response provided in letter dated 10/5/10<br><br>NRC Review and WEC to complete response.<br><br>b-d to be addressed at public meeting and audit. Will require information to be docketed. | Open-TVA/WEC<br><br>Due 3/29/11<br><br>Responses to items a and e provided.<br><br>**NNC 11/18/10:**<br>(1) Items b-d closed to other Open Item nos.<br>(2) The point of these questions was to understand how the origin of the requirements in the requirements specifications were documented. TVA stated that the origin of the requirements would be demonstrated in Rev. 2 of the CQ PAMS | ML101650255, Item No. 8 | TVA Letter dated 10/5/10 | WBN2 PAMS Software Requirements Specification<br><br>By letter dated April 8, 2010 (ML10101050203), TVA docketed WNA-SD-00239-WBT, Revision 1, ""RRAS Watts Bar 2 NSSS Completion Program I&C Projects, Software Requirements Specification for the Post Accident Monitoring System," dated February 2010 (ML101050202). |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (e) WBN2 PAMS Software Requirements Specification (WNA-SD-00239-WBT, Rev. 1) refers to Document Traceability & Compliance table on page iii. This table has three entries; Design Process for Common Q Safety Systems (NABU-DP-00014-GEN, Rev. 2), RRAS Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System – System Requirements Specification (WNA-DS-01617-WBT, Rev. 1), and RRAS Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System – System Design Specification (WNA-DS-01667-WBT, Rev. 1).<br><br>IV&V performed a Requirements Traceability Assessment during which it reviewed Software Requirements Specification (WBN2 PAMS SRS, WNA-SD-00239-WBT, Rev. 1) against System Requirements Specification (WNA-DS-01617-WBT, Rev. 1) and System Design Specification (WNA-DS-01667-WBT, Rev. 1). Requirements within Software Requirements Specification that are referring to NABU-DP-00014-GEN, Rev 2, Design Process for Common Q Safety Systems, have also been reviewed for traceability and compliance. During IV&V's RTA effort the anomaly reports V&V-769 and V&V- 770 have been initiated and reported in the IV&V Phase Summary Report for the System Definition Phase, WNA-VR-00283-WBT, Rev. 0.<br><br>IV&V has verified that the requirements in SRS are derived from the specified documents listed in the Document Traceability and Compliance Table of WBN2 PAMS SRS.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>(1) Item (a) in the original list, NABU-DP-00014-GEN Revision 2, "Design Process for Common Q Safety Systems," is available for NRC audit at the Westinghouse Rockville office.<br><br>(2) WNA-LI-00058-WT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1) contains the following change to address the NRC request:<br><br>Section 11, "TVA Contract Compliance Matrix" showing the origin of the requirements was added.<br><br>**TVA Response to Second Follow-up NRC Request:**<br><br>This item will be addressed by updating the Compliance Matrix in the Licensing Technical Report and by adding a System Requirements Specification Compliance matrix to the Revision 3 of the Licensing Technical Report. | | | LTR.<br><br>**NNC 2/3/11:** CQ PAMS LTR Rev. 2 Section 11 & 12 do not adequately demonstrate the origin of requirements in SysRS. TVA to describe how to address concern. | | | |
| **145** | | | EICB (Carte) | The WBN2 PAMS System Design Specification (WBN2 PAMS SDS) contains a table (see page iii) titled, "Document Traceability & Compliance," which states that the WBN2 PAMS SDS was created to support the WBN2 PAMS SysRS. | Responder: WEC<br><br>(1) The review and update of the RTM is complete. The revised RTM can be made available for NRC audit at the Westinghouse office in Rockville. | 11. N | Open<br><br>Response included in letter dated 12/22/10 | Open-TVA/WEC<br><br>Due 2/25/11<br><br>To be addressed by | ML101650255, Item No. 9 | | WBN2 PAMS System Design Specification<br><br>TVA docketed WNA-DS-01667-WBT Rev. 1, "RRAS Watts Bar 2 NSSS |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (a) Does the WBN2 PAMS SDS implement all of the hardware requirements in the WBN2 PAMS SysRS?<br><br>(b) Please briefly describe all of the documents that implement the hardware requirements of the WBN2 PAMS SysRS.<br><br>**This item is used to track all traceability issues with the System Design Specification (SDS).**<br><br>**At the September 15 public meeting in Rockville, the following actions were agreed to. These items partially address the traceability concerns with the System Design Specification. This item will be updated with the results of the September 20 and 21 Commercial Grade Dedication and SDS RTM audit.**<br><br>1. Westinghouse will perform completed a review of the Requirements Traceability Matrix(RT), using the issues identified at the 9/15 public meeting as a guide (documented below) and update the RTM as required.<br><br>2. Some hardware requirements are contained in the SRS instead of the System Design Specification (SDS). These will be removed from the SRS and incorporated into the next revision of the SDS.<br><br>3. 25 issues identified by V&V where some requirements have not been included in the SDS (14) and SRS (11) at the revisions reviewed by V&V. Have these been addressed? Yes. The next revisions of the SDS and SRS address these issues.<br><br>4. TVA will update the Procurement Requisition Resolution Matrix and submit it to show how the Common Q PAMS design meets the contract requirements.<br><br>5. The next issue of the IV&V report will include the Requirements phase review of the RTM and a partial review for the Design phase.<br><br>6. Westinghouse to provide the generic AC160 and flat panel specifications.<br><br>7. Westinghouse and TVA to develop a schedule of licensing document submittals that can be met by the project team.<br><br>8. The flow of information is from the SysRS to the SDS (hardware) and SRS (software). Describe how the documents are used. Describe in 1.1 of the SysRS. Need a good write up of how the process works. | (2) Please see letter Item 10 (NRC Matrix Item 142, sub item 13).<br><br>(3) Please see letter Item 10 (NRC Matrix Item 142, sub item 12).<br><br>(4) Section 11 "TVA Contract Compliance Matrix" was added to WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1).<br><br>(5) WNA-VR-00283-WBT, Revision 1, "IV&V Summary Report for the Post Accident Monitoring System," submitted in TVA to NRC letter dated December 3, 2010 (Reference 1) includes the Requirements and Design phase reviews.<br><br>(6) Per Westinghouse letter WBT-D-2268 "NRC Access to Common Q Documents at the Westinghouse Rockville Office" dated August 16, 2010 (Reference 9) "System Requirements Specification for the Common Q Generic Flat Panel Display," 00000-ICE-30155, Revision 9 is available for audit at the Westinghouse Rockville office.<br><br>The generic AC160 specifications are contained in the documents listed below. The documents are available for NRC audit at the Westinghouse Rockville office in accordance with the letter number referenced. List is contained in letter.<br><br>(7) A schedule was developed and is reviewed weekly by Westinghouse and TVA project management.<br><br>(8) The revised document submittal schedule was included as item 3 NRC Request (Matrix Item Number 142, TVA Commitments Nos. 10 and 17) in TVA letter to NRC dated October 26, 2010.<br><br>(9) The flow of documentation information was provided to the NRC inspector during the Common Q PAMS audit.<br><br>Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: RAI on SysRS, dated December 8, 2010<br><br>**TVA Response to Follow-up NRC Request:**<br><br>See Response to item 4 (Item number 142) | | During the September 20-21, 2010 audit at Westinghouse, it was acknowledged that TVA/Westinghouse had previously (in September 15, 2010 public meeting) stated:<br><br>TVA would provide the RSED RTM. (see ML102920031 Item No 6)<br><br>TVA would revise and resubmit the PAMS RTM to address all types of issues identified in the public meeting. (see ML102920031 Item No 7)<br><br>TVA would revise and resubmit the Software Verification and Validation phase summary report for the requirements phase to document the completion of the requirements phase review. (see ML102920031 Item No 8) | Revision of the RTM, SRS, SysRS, and SysDS. | | | Completion Program I&C Projects Post Accident Monitoring System- System Design Specification," dated December 2009. |
| **146** | | | EICB (Carte) | 6/17/2010<br><br>Deleted by DORL | Responder: | 137. Y | Closed | Closed | ML101650255, Item No. 10 | | PAMS System Requirements Specifications<br><br>WBN2 PAMS documents reference generic PAMS documents, for example: WBN2 PAMS SysRS References: 00000-ICE-30156 Rev. 6, "System Requirements Specification for the |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Common Q Post Accident Monitoring System", and 00000-ICE-30155, Rev. 9, "System Requirements Specification for the Common Q Generic Flat Panel Display" |
| **147** | | | EICB (Carte) | 6/17/2010<br><br>Deleted by DORL | Responder: | 138. Y | Closed | Closed | ML101650255, Item No. 11 | | PAMS System Requirements Specifications<br><br>WBN2 PAMS documents reference generic PAMS documents, for example: WBN2 PAMS SysRS References: 00000-ICE-30156 Rev. 6, "System Requirements Specification for the Common Q Post Accident Monitoring System", and 00000-ICE-30155, Rev. 9, "System Requirements Specification for the Common Q Generic Flat Panel Display" |
| **148** | | | EICB (Carte) | 6/17/2010<br><br>Deleted by DORL | Responder: | 139. Y | Closed | Closed | ML101650255, Item No. 12 | | PAMS System Requirements Specifications<br><br>WBN2 PAMS documents reference generic PAMS documents, for example: WBN2 PAMS SysRS References: 00000-ICE-30156 Rev. 6, "System Requirements Specification for the Common Q Post Accident Monitoring System", and 00000-ICE-30155, Rev. 9, "System Requirements Specification for the Common Q Generic Flat Panel Display" |
| **149** | 7.2 | 7.2 | EICB (Garg) | FSAR Section 7.1.1.2(2), Overtemperature delta T and Overpressure delta T equations have been simplified and many values are removed from the FSAR. Provide the justification for this change. | Responder: Tindell<br><br>In FSAR amendment 96 the equations were revised to agree with the Unit 1 UFSAR which is the basis document for the Unit 2 FSAR. This resulted in the equations being simplified and the removal of the values for the constants. The equations were revised to match those used in the Technical Specifications. The values for the constants are contained in the Technical Specifications and were removed as redundant.<br><br>Additional changes were made in FSAR amendments 98 and 99 to correct typographical errors found during FSAR review.<br><br>**TVA Revised Response:**<br><br>This change was incorporated in the Unit 1 FSAR in Amendment 0 as part of FSAR change package 1473. | 140. Y | Close<br><br>Response provided in letter dated 10/5/10<br><br>In FSAR amendment 96, the values of the constants have been moved to TS or plant procedures. Need to document the basis for this change.<br><br>Response is acceptable. | Closed<br><br>TVA to provide date when information will be docketed. TVA need to identify when Unit 1 UFSAR was revised with this information. | ML101720589, Item No. 1 | TVA Letter dated 10/5/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item No. 11 | |
| **150** | 7.2 | 7.2 | EICB (Garg) | Many of the changes were based on the Westinghouse document N3-99-4003. Provide this document for staff's review so the staff can determine the basis for these changes. | Responder: Clark<br><br>System description N3-99-4003, Reactor Protection System is contained in Attachment 3. | 141. Y | Close<br>Response provided in letter dated 10/5/10 | Closed | ML101720589, Item No. 2 | TVA Letter dated 10/5/10 | |
| **151** | 7.2 | 7.2 | CB (G ar | Provide the EDCR 52378 and 54504 which discusses the basis for many changes to this FSAR section. | Responder: Clark | 142. Y | Close | Closed | ML101720589, Item No 3 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | EDCR 54504 has been voided and replaced with EDCR 52378 which is contained in Attachment 4 and EDCR 52671 is contained in Attachment 5. | | Response provided in letter dated 10/5/10 | | | | |
| **152** | 7.2 | 7.2 | EICB (Garg) | Deleted portion of FSAR section 7.2.3.3.4 and moved to FSAR section 7.2.1.1.5. However, the FSAR section 7.2.1.1.5 does not include the discussion of ambient temperature and also on the calibration of the sealed reference leg system. No justification was provided for deleting this discussion. Please explain the bases for deletion of this information. | Responder: Merten/Clark<br><br>The text was revised to match the Unit 1 UFSAR. The Unit 1 text was modified in Amendment 1 by FSAR Change Package 1553 S00 which is contained in Attachment 30. The basis for the change in the change package is:<br><br>16 The update to Section 7.2.1.1.5 is taken from text in Section 7.2.2.3.4 with clarifications and editorial changes. The relocated discussion of the pressurizer water level instrumentation Is more appropriately included in this section than Section 7.2.2.3.4, which deals with control and protection system interaction. The changes to 7.2.1.1.5 are based on a general description of the Westinghouse pressurizer level design, channel independence, and actual installation attributes found on TVA physical drawings. Also, the hydrogen gas entrainment issue documented in NRC Information Bulletin No. 92-54, Level Instrumentation Inaccuracies Caused by Rapid Depressurization, is retained and clarified. Similar clarification is made to Reactor Protection System Description N3-9g.4003 Section 3.1.1.2(d). The original text in 7.2.2.3.4 provides some information that is too detailed and is not pertinent to the subject of discussion. It also includes a statement that the error effect on the level measurement during a blowdown accident would be about one inch. The basis for this value is not known; however, the worst case reference leg loss of fill error due to a rapid RCS depressurization event Is no more than 12 inches elevation head. This value is based on the relative elevation difference between the condensing chamber and the reference leg sensor bellows. The Westinghouse Owners Group response to this issue is found in RIMS # L44930216800. The channel error value discrepancy is documented in WBPER980417. The remaining text in 7.2.2.3.4 is revised to clarify the control and protection system interaction discussion.<br><br>**TVA Revised Response:**<br><br>This change was incorporated in the Unit 1 UFSAR in Amendment 1. | 143. Y | Close | Closed<br><br>Due 10/22/10<br><br>TVA to confirm if this description is the same as for Unit 1. If it is same as Unit 1 then why this was shown as change in redline version of FSAR Amendment 96.<br><br>TVA to provide date when information will be docketed. When Unit 1 UFSAR was revised. | ML101720589, Item No. 4 | TVA Letter dated 10/5/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item No. 12 | |
| **153** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.1.1.7 added the reference to FSAR section 10.4.4.3 for exception to P-12. However, FSAR section 10.4.4.3 states bypass condition is not displayed and it is not automatically removed when conditions for bypass are no longer met. Provide the basis for this. | Responder: Craig/Webb<br><br>EDC E50952-A added an alternate method of RCS cooldown using additional steam dump valves after entering Mode 4, by disabling the P-12 Interlock. Operators use additional condenser dump valves to aid in maintaining a cooldown rate closer to the administrative limit established by operating procedure.<br><br>Refer to Unit 1 UFSAR Amendment 3 Change Package 1676 S00 (Attachment 6) for the safety evaluation and basis for this change.<br><br>The 50.59 for the change is included in the Change | 144. Y | Close<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>Due 10/22/10<br><br>TVA will send 50.59.<br><br>TVA to provide date when information will be docketed. TVA did not address why bypass condition is not displayed. | ML101720589, Item No. 5 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 2 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Package.<br><br>The process is controlled by the procedures used to shutdown the plant. The procedure initiates the bypass by lifting a wire at a relay and then ensures that it is restored prior to starting the plant. GO-6 Unit Shutdown From Hot Standby To Cold Shutdown, Appendix F prescribes the steps required to bypass and restore the P-12 interlock. GO-6 Appendix F, step 3.0[6] says "PLACE Caution Order on 1-HS-1-103A, 1-HS-1-103B, AND 1-PIC-1-33 indicating that P-12 interlock is disabled." This provides indication to the operators that the P-12 interlock is bypassed. GO-6 Appendix F, step 4.0[1] says "**WHEN** steam dumps no longer affect plant cooldown **OR** plant heatup is desired, **THEN ENSURE** MIG re-enables P-12 Interlock USING Section 6.0 of this Appendix, LANDING LEADS TO RE-ENABLE P-12 INTERLOCK." GO-6 Appendix F, step 4.0[2] states "**REMOVE** Caution Order on 1-HS-1-103A, 1-HS-1-103B, **AND** 1-PIC-1-33 indicating that P-12 interlock is disabled. | | | | | | |
| **154** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.1.1.10, setpoints: NRC staff has issued RIS 2006-17 to provide guidance to the industry regarding the instrument setpoint methodology which complies with 10 CFR 50.36 requirements. Provide the information on how the WBN2 setpoint methodology meets the guidance of RIS 2006-17 and include this discussion in this section. Also, by letter dated May 13, 2010, TVA provided Rev. 7 of EEB-TI-28 to the staff. The staff noted that section 4.3.3.6 of EEB-TI-28 discusses the correction for setpoints with a single side of interest. It should be noted that the staff has not approved this aspect of setpoint methodology for Unit 1. The staff finds this reduction in uncertainties is not justified unless it can be demonstrated that the 95/95 criteria is met. Therefore, either remove this reduction factor for single sided uncertainties or justify how you meet the 95/95 criteria given in RG 1.105. | Responder: Craig/Webb<br><br>(Q1) Refer to the response to letter item 13, RAI Matrix Item 51.<br><br>(Q2) EEB-TI-28's single sided methodology conforms with WBN's design basis commitment to ensure that 95% of the analyzed population is covered by the calculated tolerance limits as defined in NRC Reg Guide 1.105, Revision 2, 1986 that was in affect during WBN Unit 1 licensing. The single sided methodology is not used for any TSTF-493 setpoints that use TI-28 methodology.<br><br>**TVA Revised Response:**<br><br>In order to respond to other NRC comments on the setpoint methodology discussion in FSAR Amendment 100, TVA reviewed the previous response to this RAI. This resulted in a complete rewrite of the responses to this question as shown below. As a result, the response does not specifically address the NRC Follow-up Request. However, the overall responses to all of the NRC RAIs on setpoint methodology addresses this item.<br><br>(Q1) WBN 2 implementation of TSTF-493, Rev. 4, Option A includes addition of a discussion of the WBN setpoint methodology in FSAR section 7.1.2.1.9.<br><br>(Q2) Electrical Engineering Branch (EEB) Technical Instruction (TI) 28, Setpoint Calculations, single-sided methodology conforms to WBN's design basis commitment to ensure that 95% of the analyzed population is covered by the calculated tolerance limits as defined in NRC Reg Guide 1.105, Revision 2, 1986, which was in effect during WBN Unit 1 licensing. Single-sided multipliers are not used for any TSTF-493 setpoints. | 145. Y | Closed<br><br>Response is not acceptable. A revised response will be submitted in the letter dated 10/29/10. | Closed<br><br>Due 12/17/10<br><br>Pending FSAR Amendment 102 submittal.<br><br>FSAR AMD 100. Since all the setpoint and allowable value for Unit 2 is calculated and added to TS, TVA needs to address the latest criteria and that include 95/95 criteria. Why the last sentence has been modified by adding TI-28. It was NRC's understanding that all setpoints have to meet TI-28 | ML101720589, Item No. 6 and EICB RAI ML102861885 Item No. 8 | TVA Letter dated 10/5/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item No. 13 | EICB RAI ML102861885 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | There are some areas where a 95% confidence level could not be achieved. Some examples would be harsh environment instrumentation where only 2 or 3 devices were tested in the 10CFR50.49 program. In these situations, the Confidence is referred to as "high.". | | | | | | |
| **155** | 7.2 | 7.2 | EICB (Garg) | Summary of FSAR change document section 7.2 states that sections 7.2.1.1.9 and 7.2.2.2(4) are changed to show that these activities will occur in future. However, no changes were made to the FSAR sections. Please explain. | Date:<br>Responder: Stockton<br><br>The change package summary were the changes recommended by Engineering. TVA Licensing is responsible for the actual submittal and elected not to incorporate these recommendations. The activities are complete and the text in Amendment 99 of the FSAR is correct. | 146. Y | Closed | Closed<br><br>TVA to provide date when information will be docketed | ML101720589, Item No. 7 | | |
| **156** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.1.1 states that dashed lines in Figure 15.1-1……designed to prevent exceeding 121% of power…….The value of 121% is changed from 118%. The justification for this change states that this was done to bring the text of this section in agreement with section 4.3.2.2.5, 4.4.2.2.6 and table 4.1-1. However, Table 4.1-1 and section 4.3.2.2.5 still show this value as 118%. Justify the change. | Responder: WEC<br><br>Per Westinghouse letter WBT-D-2340, TENNESSEE VALLEY AUTHORITY WATTS BAR NUCLEAR PLANT UNIT 2 FSAR Markups Units I and 2 118% vs. 121 % and Correction to RAI Response SNPB 4.3.2-7, (Reference 17) the 118% value should be 121%. Depending on the use in the FSAR either 118% or 121% are the correct values. As a result of the question, Westinghouse reviewed all locations where either 118% or 121% are used and the context of use and provided a FSAR markup to reflect the correct value at the specific location. These changes will be incorporated in a future FSAR amendment.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>The following response was provided by Westinghouse letter WBT-D-2690 "Follow Up -NRC Request on 118% and 121 % FSAR Power Levels," dated December 6, 2010 (Reference 2). This corrects the information provided in TVA letter to NRC letter dated October 5, 2010 (Reference 21)<br><br>A review of the markups provided by Westinghouse (Reference 4) and the current Unit 2 FSAR shows that in the context of the Power Range High Neutron Flux, High Setting, the value of 118% is correct. In the context of the peak core power during certain transients to confirm the fuel melt criterion, the value of 121% is correct. A detailed discussion of peak core power during transients is contained in FSAR Chapter 4.3.2.2.5, "Limiting Power Distributions." | 147. Y | Closed<br><br>Revised response included in letter dated 12/22/10.<br><br>Response is included in letter dated 10/5/10 | Closed<br><br>Due 12/22/10<br><br>Amendment 101 Submitted 10/29/10.<br><br>TVA needs to justify why some places 121% is used and other places 118% is used . What does 121% or 118% means. | ML101720589, Item No. 8 | TVA Letter dated 10/5/10 | Response on hold pending Westinghouse review. |
| **157** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.1.1, fifth paragraph was deleted except for the last sentence. The last sentence states that, "The P-8 interlock acts essentially as a high nuclear power reactor trip when operating in this condition." This sentence is confusing because the condition is not defined. Please clarify this discrepancy. | Responder: Tindell<br><br>The condition is defined in the preceding discussion as operating with a reactor coolant pump out of service and core power less than 25%. | 148. Y | Close<br><br>Response provided in letter dated 10/5/10<br><br>Response Acceptable | Closed | ML101720589, Item No. 9 | TVA Letter dated 10/5/10 | |
| **158** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.1.1, paragraph six was changed to state that the design meets the requirements of Criterion 23 of the 1971 GDC instead of the Criterion 21 of the GDC. The Criterion 21 is about protection system reliability and testability, while Criterion 23 is about protection system failure modes. Since this paragraph deals with the evaluation of design with respect to common-mode | Responder: Tindell<br><br>FSAR Amendment 99 reflects the change to Criterion 23. | 149. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | ML101720589, Item No. 10 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | failure, the staff believes that Criterion 23 is the right reference for this paragraph. Please clarify. | | | | | | | |
| **159** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.1.2 discusses reactor coolant flow measurement by elbow taps. However, it further states that for Unit 2, precision calorimetric flow measurement methodology will be used. If elbow taps are not used for Unit 2, then why does this section discuss this methodology? It is the staff's understanding that TVA plans to use elbow taps methodology in the future for Unit 2. Please revise this section to describe the current plant design/methodology. | Responder: Craig<br><br>For the purposes of measuring reactor coolant flow for Reactor Protection functions, elbow taps are used for both Unit 1 and 2. The discussion and equation are valid for establishing the nominal full power flow which is used to establish the Reactor Protection System low flow trip setpoint. However the method used to verify reactor coolant flow, as required by the Technical Specifications, is not the same. Unit 1 uses a simplified methodology based on elbow tap ΔP measurements correlated with precision calorimetric data over several cycles of operation as described in Reference 17, WCAP-16067, Rev 0, RCS Flow Measurement Using Elbow Tap Methodology at Watts Bar Unit 1. The plan is for Unit 2 to transition to this method after sufficient data is obtained. Pending this transaction, 7.2.2.1.2 will be revised as follows:<br><br>From:<br>"Nominal full power flow is established at the geginning of each fuel cycle by either elbow tap methodology or, performance of the RCS calorimetric flow measurement, (For Unit 1 elbow tap methodology is implemented for RCS flow measurement (Reference [17]) and Unit 2 may implement elbow tap methodology at a future date) the results of which are used to normalize the RCS flow indicators. This provides a reference point for the low flow reactor trip setpoint, and also provides a relatively simple method for periodic verification of the thermal design flow assumed in the safety analysis, as required by the Technical Specifications. Accuracy and repeatability of the flow measurement instrumentation are considered in establishment of the low flow setpoint and the minimum required flow and are adequate for these functions. This is for Unit 1 only. For Unit 2, the precision calorimetric flow measurement methodology will be used."<br><br>To:<br>"Nominal full power flow is established at the beginning of each fuel cycle by either elbow tap methodology or, performance of the RCS calorimetric flow measurement. Unit 1 utilizes elbow tap methodology Reference [17]. Unit 2 utilizes the RCS calorimetric flow measurement. The results are used to normalize the RCS flow indicators and provide a reference point for the low flow reactor trip setpoint." | 150. Y | Close<br><br>Response provided in letter dated 10/5/10<br><br>Response Acceptable | Closed<br><br>Due 10/31 | ML101720589, Item No. 11 | TVA Letter dated 10/5/10 | |
| **160** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.2(7) deleted text which has references 12 and 14. These references are not included in the revised text. Provide the basis for the deletion of these references. Also, the revised text states that typically this requirement is satisfied by utilizing 2/4 logic for the trip function or by providing a diverse trip. Provide any exception to this and their basis for acceptability. | Responder: Tindell<br><br>The text was revised to match the Unit 1 UFSAR. The Unit 1 text was modified in Amendment 1 by FSAR Change Package 1553 S00 which is contained in Attachment 30. The basis for the change in the change package is:<br><br>23. (page 7.2-24): Portions of the discussion of control and protection system interaction are revised to clarify the requirement. The discussion of how the SG low-low water level protective function and the control system Median | 151. Y | Close<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>10/21 | ML101720589, Item No. 12 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Signal Selector satisfy this requirement is deleted since it Is redundant to the information provided In Section 7.2.2.3.5. Reactor Protection System Description N3-99-4003 is also revised to move and clarify the discussion of the requirements for control and protection system Interaction from Section 3.1.1.2 to Section 2.2.11, where the Issue is also discussed. | | | | | | |
| **161** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.3 states that changes to the control function description in this section are expected to be required after vendor design of the Unit 2 Foxboro IA design is complete. Provide the schedule for the completion of the design and when this information will be available to the staff for review and approval. | Responder: Clark<br><br>FSAR Amendment 99 reflects the changes associated with the Foxboro I/A system design. | 152. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | ML101720589, Item No. 13 | TVA Letter dated 10/5/10 | |
| **162** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.2(14) states that bypass of a protection channel during testing is indicated by an alarm in the control room. Explain how this meets RG 1.47. | Responder: Tindell<br><br>The Bypassed and Inoperable Status Indication System (BISI) compliance with Reg. Guide 1.47 is described in detail in FSAR Section 7.5.2.2. | 153. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | ML101720589, Item No. 14 | TVA Letter dated 10/5/10 | |
| **163** | 7.2 | 7.2 | CB (G ar | Deleted by DORL | Date:<br>Responder: | 154. Y | Closed | Closed | ML101720589, Item No. 15 | | |
| **164** | 7.2<br>7.5.1.1 | 7.2 | EICB (Garg\|Marcus) | FSAR section 7.2.2.2(20) has been revised to include the plant computer as a means to provide information read out for all signals which can cause a reactor trip. Justify the use of the plant computer for this function. Include the discussion on the effect of plant computer failure on the system functions. | Responder: Perkins<br><br>The primary purpose of the plant computer is to present plant process and equipment status information to the control room operators to assist them in the normal operations of the unit, and inform them of any abnormal conditions. The plant computer obtains real-time plant parameter information via Data Acquisition Systems(DAS)(multiplexers, etc.) by scanning preassigned analog, pulse, and contact sensors located throughout the plant. The computer is not defined as being primary safety-related and it is not required to meet the single failure criterion or be qualified to IEEE criteria for Class 1E equipment.<br><br>The plant computer system acquires, processes, and displays all data to support the assessment capabilities of the Main Control Room (MCR). To help ensure that reactor trip and other information presented to the Operations staff is reliable:<br><br>• The data undergoes several validation steps before being presented to the operators. When redundant sensors are used, the data received by the computer can be processed by software to determine if the quality of one or more points is questionable.<br><br>• Any software associated with the computer and the DAS must meet the quality requirements of plant procedure SPP-2.6, “Computer Software Control” which is based on requirements in NUREG/CR-4640, the Watts Bar Nuclear Quality Assurance Plan, and SS-E18.15.01 - “Software Requirements for Real-Time Data Acquisition and Control Computer Systems”, which complies with IEEE Std. 279-1971 “Criteria for Protection Systems for Nuclear Power Generating Stations”. The computer software is controlled by a Software Quality Assurance Plan. | 155. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>TVA letter dated 10/5/10 Response 44 provided information. | Closed<br><br>NRC to issue formal RAI to TVA | ML101720589, Item No. 16 and EICB RAI ML102861885 Item No. 8 | TVA Letter dated 10/5/10 | Item No. 8 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | • One of the requirements in 10 CFR 50, Appendix A states that "Appropriate controls shall be provided to maintain variables monitored and systems within prescribed operating ranges." Periodic maintenance and calibration will be performed on the computer and DAS. In addition, calibration procedures for instrumentation which is used for input to the computer include verification of the computer input signal at the DAS and as displayed on the display stations.<br><br>• The software and associated hardware undergoes a detailed Factory Acceptance Test prior to installation in the plant. After installation in the plant, a Site Acceptance Test (SAT) will be conducted. The SAT will include several tests: computer accuracy, analog input accuracy, calculated value accuracy, computer performance, system response times, all input/output (from termination strip to display stations/printers), all data ports, and computer power supplies.<br><br>• In order to minimize the possibility of bad sensor inputs to the Safety Parameter Display System (SPDS) and/or inaccurate SPDS display of sensor inputs, routine instrument loop calibration of sensors that provide input to the SPDS will include verification that the SPDS-displayed values are correct. WBN's instrument surveillance instructions will incorporate these verifications.<br><br>Effect of plant computer failure on system functions<br>The WBN Unit 2 is designed on the basis that it can still operate when the plant computer is inoperable. The computer is not required for safe shutdown of the plant during external design basis events such as tornadoes, floods, rain, and transportation accidents. Operators are trained to respond to accidents both with and without the computer information available. The control room instrumentation provides the operators with the information necessary for safe reactor operations under normal, transient, and accident conditions.<br><br>The DAS is mechanically and electrically isolated from the safety systems to avoid degradation of the systems should the computer and/or DAS fail.<br><br>The computer is not expected to perform any nuclear safety-related function, therefore, the computer need not be designed to meet nuclear safety-related Class 1E, single-failure criteria. The computer is not designed to safety system criteria and therefore is not to be used to perform functions essential to the health and safety of the public. | | | | | | |
| **165** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.3.2, last paragraph of this section has been deleted. The basis for this deletion is that discussion regarding the compliance with IEEE-279, 1971 and GDC 24 is covered in section 7.2.2.2. However, there is no reference to this section in 7.2.2.3.2 to direct the reader to 7.2.2.2. Please revise 7.2.2.2 accordingly. | Responder: Clark<br><br>The reference to Section 7.2.2.2 for the general discussion for control and protection interactions is provided in Section 7.2.2.3. The reference in Section 7.2.2.3 is applicable to all Sub-Section paragraphs, including 7.2.2.3.2. An additional reference in this section is not necessary and would be redundant to the Section 7.2.2.3 reference. | 156. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | ML101720589, Item No. 17 | TVA Letter dated 10/5/10 | |
| **166** | 7.2 | 7.2 | — G | Changes to FSAR section 7.2.2.2(20) are justified based on the | Responder: Clark | 157. Y | Closed | Closed | ML101720589, Item | TVA Letter dated | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | statement that the integrated computer system is implemented through EDCR 52322. Provide a copy of EDCR 52322 for staff review. | EDCR 52322 is contained in Attachment . | | Response provided in letter dated 10/5/10 | | No. 18 | 10/5/10 | |
| **167** | 7.2 | 7.2 | EICB (Garg) | FSAR section 7.2.2.4, provide an analysis or reference to chapter 15 analysis which demonstrate that failure of rod stop during a rod withdrawal event will not affect the safety limit. | Responder: Clark<br><br>Continuous rod withdrawal events are analyzed in FSAR sections 15.2.1 and 15.2.2. While the rod stops a mentioned, they are not credited in the analysis. | 158. Y | Close<br><br>Response provided in letter dated 10/5/10 | Closed | ML101720589, Item No. 19 | TVA Letter dated 10/5/10 | |
| **168** | 7.2 | 7.2 | EICB (Garg) | FSAR table 7.2-4, item 9 deleted loss of offsite power to station auxiliaries (station blackout) based on the fact that station blackout is not listed in AAPC events. Explain what are AAPC events and how it justifies deleting this accident from the list. | Responder: Clark<br><br>This change is in accordance with the Unit 1 UFSAR. The change was made by FSAR Change Package 1553 S00 (Attachment 30). The justification for the change is:<br><br>"38 (Table 7.2-4): This table lists the reactor trips and the various accident analyses for which each trip could provide protection. The intent of the table is to demonstrate the diversity of and comprehensive protection provided by the reactor trip system against various postulated events and to correlate the trip functions with the analyses in which they may be utilized, either as a primary or secondary protective function. Chapter 15, along with the Accident Analysis Parameters Checklist, WB-OC-40-70, provides the accident analysis discussion and identifies the protection system functions which provide accident mitigation. The additions and deletions to the table are made for consistency with the safety analyses of record as reflected in the design and licensing basis and do not represent analysis changes or protection system changes. Therefore. they are considered to be non-significant as discussed at the beginning of this section. Neutron Monitoring System Description N3-85-4003 Table 2 is also revised for consistency with WB-DC-40-70." | 159. Y | Close<br>Response provided in letter dated 10/5/10 | Closed | ML101720589, Item No. 20 | TVA Letter dated 10/5/10 | |
| **169** | | | EICB (Garg) | 6/18/2010<br><br>Describe the design changes which were made to Unit 1 by 10CFR50.59 process and which significantly affect the instrumentation and controls systems discussed in FSAR Chapter 7. | Responder: Clark<br><br>This is a duplicate of items 2, 10, 11 and 44 | 160. Y | Closed | Closed | | | |
| **170** | | | EICB (Garg) | 6/17/2010<br><br>TVA needs to document that Arnold Magnetics power supplies have been used and environmentally qualified at Unit 1 and therefore meet the licensing basis for Unit 2. If these power supplies are not used and qualified in Unit 1, then TVA will have to discuss the qualification of these power supplies based on the guidance provided in RG 1.209 (Open Item # 2 of Eagle 21 audit.) | Responder: Clark<br><br>This is a duplicate of item 113. | 161. Y | Closed | Closed | | | |
| **171** | 7.2 | 7.2 | EICB (Garg) | 6/17/2010<br><br>An external unidirectional communications interface was installed between the Eagle 21 test subsystem and the plant process computer. TVA should confirm that testing has demonstrated that two way communication is impossible with the described configuration. (Open Item # 3 of Eagle 21 audit) | Responder: Craig<br><br>The external Eagle 21 unidirectional communications interface will be tested prior to WBN Unit 2 fuel load | 162. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed | EICB RAI ML102910008 itemI#49 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 3 | Closed to SE Open Item |
| **172** | | | EICB (Garg | 6/17/2010<br><br>During a FAT diagnostic test, the Loop Calculation Processor | Responder: Craig<br><br>This is a duplicate of the rack 5 update issue item 114. | 163. Y | Closed | Closed | EICB RAI ML102910008 Item#50 | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (LCP) failed while performing a parameter update. TVA should identify the cause and fix for the problem encountered. (Open Item # 1 of Eagle 21 audit) | | | | | | | |
| **173** | 7.1 | 7.1 | EICB (Garg) | 6/17/2010<br><br>EEB-TI-28 discusses the correction for setpoints with a single side of interest. The staff finds this correction factor is not justified. TVA should justify this correction factor and demonstrate that, with this correction, factor 95/95 criteria identified in RG 1.105 is met. | Responder: Craig/Webb/Powers<br><br>Please see the revised response to letter item 3 (I&C Matrix Item 154) question (Q1). | 164. Y | Closed | Closed<br><br>to OI 154<br><br>TVA to provide date when information will be docketed | EICB RAI ML102910008 Item#51 | | |
| **174** | | | EICB (Garg) | 6/28/2010<br><br>Placeholder: The staff has identified questions regarding unidirectional communications interface. The staff will keep this item open until TVA confirms testing has demonstrated that two way communication is impossible with the described configurations. | Responder: Hilmes/Craig<br><br>Duplicate of 171 | 165. Y | Closed | Closed | EICB RAI ML102910008 Item#52 | | |
| **175** | | | EICB (Garg) | June 28, 2010<br><br>Placeholder: The staff has identified questions regarding diversity. The staff will keep this item open until TVA provides the related WCAP to the staff for its review and approval. | Responder:<br><br>WCAP-13869 rev.2. is submitted in response to item | 166. Y | Closed<br><br>In FSAR amendment 98, reference 6 added a new WCAP-13869 rev.2. Has this WCAP been reviewed by the staff. If not then provide the copy of WCAP for staff review. | Closed<br><br>This item is covered under item 78.<br><br>TVA to provide date when information will be docketed. | EICB RAI ML102910008 Item#53 | | |
| **176** | 7.1 | 7.1 | EICB (Garg) | 6/28/2010<br><br>Placeholder: The staff has identified questions regarding instrument setpoints. The staff will keep the instrument setpoint methodology issue open until TVA provides additional information regarding RIS 2006-17 and single sided correction factor for uncertainty determination. | Responder: Craig/Webb<br><br>Setpoint methodology questions are addressed in the revised response to letter item 3 (I&C Matrix Item 154). | 167. Y | Closed | Closed<br><br>to OI 154<br><br>TVA to provide date when information will be docketed | EICB RAI ML102910008 Item#54 | | |
| **177** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 7/15/2010<br><br>FSAR Amendment 99 Section 7.5.1.2 states: "Type A Variables Those variables that provide primary information to the MCR operators to allow them to take preplanned manually controlled actions for which no automatic action is provided and that are required for safety systems to accomplish their safety functions for Chapter 15 design basis events. Primary information is information that is essential for the direct accomplishment of specified safety functions."<br><br>Clarify whether Unit 2 has the same Type A variables as Unit 1. | Responder: Clark<br><br>The type A variables are the same in Unit 1 and Unit 2. See calculation WBNOSG4047 Rev. 4 (Attachment ) | 168. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>August 19, 2010 - TVA to submit calculation.<br><br>Review of Unit 2 FSAR confirms Unit 1 and Unit 2 Type A variables are the same.<br><br>Not necessary to docket WBNOSG4047. | Closed<br><br>09/16/10 | N/A | TVA Letter dated 10/5/10 | RAI not required |
| **178** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 7/15/2010<br><br>Please provide WBN-OSG4-047, "PAM Type A Variable Determination." | Responder: Clark<br><br>See response to item 177 above. | 169. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>August 19, 2010 - TVA to submit calculation.<br><br>Review of Unit 2 FSAR confirms | Closed<br><br>09/16/10 | N/A | TVA Letter dated 10/5/10 | RAI not required |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Unit 1 and Unit 2 Type A variables are the same.<br><br>Not necessary to docket WBOSG4047. | | | | |
| **179** | | | EICB (Carte) | An emphasis is placed on traceability in System Requirements Specifications in the SRP, in the unmodified IEEE std 830-1993, and even more so given the modifications to the standard listed in Regulatory Guide 1.172, which breaks with typical NRC use of the word "should" regarding backwards traceability to say "Each identifiable requirement in an SRS must be traceable backwards to the system requirements and the design bases or regulatory requirements that is satisfies"<br><br>Discuss how TVA has ensured that there is traceability (and particularly backward traceability) for each requirement. If requirements are not traceable, please explain how the SRS complies with the regulations that underlie the SRP. | Responder: WEC<br><br>Steve Clark to look at how to combine traceability items.<br><br>Was addressed to during the 9/15 meeting and 9/20 - 9/21 audit.<br><br>Closed to Item 142. | 170. Y | Closed | Closed | N/A – Closed to Item No. 142 | NA | |
| **180** | | | EICB (Carte) | The SRP, BTP 7-14, Section B.3.3.1 states that Regulatory Guide 1.172 endorses, with a few noted exceptions, IEEE Std 830-1993. "IEEE Recommended Practices for Software Requirements Specifications."<br><br>Clarify whether the WBU2 Post Accident Monitoring System's Software Requirements Specification adheres to IEEE std 830-1993 as modified by Regulatory Guide 1.172?<br><br>If yes, please provide an evaluation that includes an identification and description of all differences proposed from the modified standard. Please describe how the alternatives provide an acceptable method of complying with those regulations that underlie the corresponding SRP acceptance criteria.<br><br>If no then please provide an evaluation that includes an identification and description of all differences proposed from the acceptance criteria given in SRP , BTP 7-14, Section B.3.3.1. Please describe how the alternatives provide an acceptable method of complying with those regulations that underlie the corresponding SRP acceptance criteria. | Responder: WEC<br><br>Steve Clark to look at how to combine traceability items.<br><br>Will be addressed to during the 9/15 meeting and 9/20 - 9/21 audit.<br><br>Closed to Item 142. | 171. Y | Closed | Closed<br><br>TVA to provide date when information will be docketed | N/A – Closed to Item No. 142 | NA | |
| **181** | | | EICB (Carte) | An emphasis is placed on traceability in System Requirements Specifications in the SRP, in the unmodified IEEE std 830-1993, and even more so given the modifications to the standard listed in Regulatory Guide 1.172, which breaks with typical NRC use of the word "should" to say "Each identifiable requirement in an SRS must be traceable backwards to the system requirements and the design bases or regulatory requirements that is satisfies"<br><br>Explain the source(s) of the requirements present in the Post Accident Monitoring System's Software Requirements Specification. To clarify, many documents have requirements that are incorporated by reference into the SRS, but what served to | Responder: WEC<br><br>Steve Clark to look at how to combine traceability items.<br><br>Will be addressed to during the 9/15 meeting and 9/20 - 9/21 audit.<br><br>Closed to Item 142. | 172. Y | Closed | Closed | N/A – Closed to Item No. 142 | NA | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | direct the author to include those various documents in the SRS or, if the requirement is based on the System Requirements Specification, what directed the author to include the requirement there? | | | | | | | |
| **182** | | | EICB (Carte) | Characteristics that the SRP states that a Software Requirements Specifications should have include unambiguity, verifiability, and style, part of the latter is that "Each requirement should be uniquely and completely defined in a single location in the SRS."<br><br>Clarify whether the unnumbered paragraphs in the Post Accident Monitoring System's Software Requirements Specification, such as in the section headings, or are all such sections simply considered to be informative?<br><br>Does the same apply to documents referenced by the SRS? Such as WCAP-16096-NP-A, Rev. 1A, "Software Program Manual for Common Q Systems," which is incorporated by reference in requirement R2.3-2 in the SRS.<br><br>R2.3-2 [The PAMS software shall comply with the requirements and guidelines defined in WCAP-16096-NP-A, "Software Program Manual for Common Q Systems".]<br><br>If any requirements are expressed in such unnumbered paragraph form instead of individually identified requirements, please list them, describe why they satisfy the fundamental requirement of unambiguity, and describe how they were verified. | Responder: WEC<br><br>Steve Clark to look at how to combine traceability items.<br><br>Will be addressed to during the 9/15 meeting and 9/20 - 9/21 audit.<br><br>Closed to Item 142. | 173. Y | Closed | Closed | N/A – Closed to Item No. 142 | NA | |
| **183** | | | EICB (Carte) | 7/15/2010<br><br>An emphasis is placed on traceability in System Requirements Specifications in the SRP, in the unmodified IEEE std 830-1993, and even more so given the modifications to the standard listed in Regulatory Guide 1.172, which breaks with typical NRC use of the word "should" to say "Each identifiable requirement in an SRS must be traceable backwards to the system requirements and the design bases or regulatory requirements that is satisfies"<br><br>On page 1-2 of the Post Accident Monitoring System's Software Requirements Specification in the background section, is the sentence "Those sections of the above references that require modification from the generic PAMS are defined in the document" referring purely to the changes from WNA-DS-01617-WBT "Post Accident Monitoring System-System Requirements Specification" or is it saying that there are additional changes beyond those and that the SRS defines them?<br><br>If there are additional changes, what is their origin? | Responder: WEC<br><br>The generic Software Requirements Specification applies except as modified by the WBN Unit 2 System Requirements Specification.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>Please see the response to RAI item 12 in letter dated 12/22/10, NRC Matrix Item 144.<br><br>**TVA Response to Second Follow-up NRC Request:**<br><br>This item will be addressed by updating the Compliance Matrix in the Licensing Technical Report and by adding a System Requirements Specification Compliance matrix to the Revision 3 of the Licensing Technical Report. | 12. Y | Open<br><br>Revised response included in letter dated 12/22/10.<br><br>Response provided in letter dated 10/21/10 | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 11/18/10**: The point behind this open item was that TVA must demonstrate that the origin of each requirement in the WEC requirements specification is known and documented. TVA stated that this information would be in CQ PAMS LTR Rev. 2.<br><br>**NNC 2/3/11:** CQ PMS LTR Rev. 2 Sections 11 & 12 do not prove this information. TVA to proive a plan to address requested information. | EICB RAI ML102980066 Item No. 9 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 4 | |
| **184** | | | EICB (Carte) | 7/15/2010<br><br>The NRC considers that a System Requirements Specification is the complete set of requirements used for the design of the software, whether it is contained within one document or many. In order to evaluate an SRS against the guidance in the SRP the staff | Responder: WEC<br><br>Steve Clark to look at how to combine traceability items.<br><br>Will be addressed to during the 9/15 meeting and 9/20 - 9/21 audit. | 174. Y | Closed | Closed | N/A – Closed to Item No. 142 | N/A | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | needs access to all the requirements.<br><br>Are there any sources of requirements in parallel with the Post Accident Monitoring System's Software Requirements Specification? Meaning does the SRS contain, explicitly or by reference, all the requirements that were used in the design phase for the application specific software, or do software design phase activities use requirements found in any other source or document? If so, what are these sources or documents? | Closed to Item 142. | | | | | | |
| **185** | | | EICB (Carte) | 7/15/2010<br><br>An emphasis is placed on the traceability of requirements in Software Requirements Specifications in the SRP, in the unmodified IEEE std 830-1993, and even more so given the modifications to the standard listed in Regulatory Guide 1.172, which breaks with typical NRC use of the word "should" to say "Each identifiable requirement in an SRS must be traceable backwards to the system requirements and the design bases or regulatory requirements that is satisfies" Also the NRC considers that the SRS is the complete set of requirements used for the design of the software, whether it is contained within one document or many. In order to evaluate an SRS against the guidance in the SRP the staff needs access to all the requirements.<br><br>References 12, 27, 29, and 31-44 in the Post Accident Monitoring System's Software Requirements Specification are various types of "…Reusable Software Element…".<br><br>These references are used in the body of the SRS, for example:"<br><br>R5.3.14-2 [The Addressable Constants CRC error signal shall be TRUE when any CAL CRC's respective ERROR terminal = TRUE (WNA-DS-00315-GEN, "Reusable Software Element Document CRC for Calibration Data" [Reference 12]).]<br><br>They are also included via tables such as found in requirement R7.1.2-1<br><br>[The Watts Bar 2 PAMS shall use the application-specific type circuits and custom PC elements listed in Table 7.1-1.]<br><br>Do the referenced reusable software element documents include requirements not explicitly stated in the SRS? If so what is their origin? | Responder: WEC<br><br>Steve Clark to look at how to combine traceability items.<br><br>Was addressed to during the 9/15 meeting and 9/20 - 9/21 audit.<br><br>**TVA Response to Follow-up NRC Request:**<br>(1) See NRC Matrix Item 144<br>(2) There is no RTM for development of the individual reusable software elements. As listed in item 15 of Table 6-1 "Document Requirements" of WNA-LI-00058-WT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC, dated December 3, 2010, a RTM for implementation of the RSEDs (WNA-VR-00280-WBT) for the WBN Unit 2 Common Q PAMS has been developed. This document is available for NRC audit at the Westinghouse Rockville office. | 5. N | Open<br><br>Response included in letter dated 12/22/10. | Open-NRC Review<br><br>**Due (1) 12/3/10**<br>**(2) 12/22/10**<br><br>**NNC 11/18/10**: **(1)**The point behind this open item was that TVA must demonstrate that the origin of each requirement in the WEC requirements specification is known and documented. TVA stated that this information would be in CQ PAMS LTR Rev. 2. **(2)** TVA also said it would provide a RTM for the RSED<br><br>**NNC 2/3/11:** To be addressed during next audit. | EICB RAI ML102980066 Item No. 17 | | |
| **186** | 7.7.8 | 7.7.1.12 | EICB (Darbali) | 7/15/2010<br><br>Along with Amendment 96, TVA submitted a list of Bechtel changes for each section. Change number 45 addresses a change to section 7.7.1.12, AMSAC, however, the Justification column states "This change is not included. EDCR 52408 installs | Responder: Perkins/Clark<br><br>No. The previous wording reflected operation of the computer based AMSAC system. The change reflects the operation of the relay logic based system that replaced the original computer based system in Unit 1. Unit 2 is installing | 175. Y | Closed<br><br>Response included in letter dated 10/29/10 | Closed | EICB RAI No.6 ML102910017, 10/19/10 | TVA Letter dated 10/5/10<br><br>TVA Letter dated 10/29/10 Enclosure 1 Item | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | the AMSAC in Unit 2. It does not have a trouble alarms. The existing words better reflect the operation of the system."<br><br>Even thought this change was not included in Amendment 96, will it be included in a future amendment?<br><br>Also, please submit a summary of EDCR 52408. | a similar relay logic based system, so the change to the Unit 1 wording is applicable to Unit 2.<br><br>EDCR 52408 Summary<br><br>A Purchase Order was issued to Nutherm International to provide a Unit 2 cabinet with the same functions as the current Unit 1 AMSAC. EDCR 52408 will install the cabinet and route/install cabling to provide the necessary inputs/outputs for/from the AMSAC cabinet.<br><br>In the Main Control Room, three cables will be installed for the AMSAC handswitch on 2-M-3 and "AMSAC NOT ARMED" and "AMSAC ACTUATED" annunciator windows.<br><br>In the Turbine Building, two pressure transmitters will be installed in two local panels to sense turbine pressure. Cables will be routed to the transmitters to provide the signal and power. Four cables will be routed to a local panel to provide steam generator level signals.<br><br>In the Control Building, three cables will be routed to separation relays which will provide the start signal for the Motor Driven Auxiliary Feedwater Pumps, Turbine Driven Auxiliary Feedwater Pump, and initiate a Turbine Trip. Additionally, a cable will be routed to Unit 2 ICS for 'AMSAC NOT ARMED" and "AMSAC ACTUATED" log points.<br><br>This EDCR is intended to configure Unit 2 AMSAC like Unit 1 when possible.<br><br>**TVA Revised Response:**<br><br>No further changes to the FSAR associated with AMSAC are planned. | | Response is satisfactory.<br><br>**Follow-up NRC Request:**<br><br>**TVA to state that no further FSAR changes are planned.** | | | No. 14 | |
| **187** | | | EICB (Carte) | By letter dated June 18, 2010, TVA docketed responses to NRC requests for information.<br><br>1) Enclosure 1, Item No. 33 of the TVA letter dated June 18, 2010, did not identify any connection from the PAMS Operator Modules (OMs) to the plant computer and printers; however, Figure 2.1-1 of the PAMS System Requirements Specification (WNA-DS-01617-WBT Rev. 1 – ML101680578) shows a TCP connection from the OMs to the plant computer and printer. Please explain.<br><br>2) Please clarify whether any digital safety-related systems or components have a digital communications path to non-safety-related systems or with safety related systems in another division. If so, NRC staff will need these paths identified on the docket. | Responder: Merten<br><br>1) Please refer to the revised response to letter dated 10/5/10 Item 18 (RAI Matrix item 115).<br><br>2) This is a duplicate of closed RAI Matrix Item 45.<br><br>**TVA Response to Follow-up NRC Request:**<br>A review of the following documents determined that the connection between the OM and the plant computer has been changed to a connection to a printer:<br>1. WNA-DS-01617-WBT-P, Revision 3, "Post Accident Monitoring System - System Requirements Specification," dated November 2010<br>2. WNA-DS-01667-WBT-P, Revision 3, "Post Accident Monitoring System – System Design Specification," | 176. N | Closed<br><br>Revised response included in letter dated 12/22/10.<br><br>Partial Response provided in letter dated 10/5/10<br><br>**NNC 8/25/10:** Why did TVA not catch this on the review of the PAMS SysRS or SRS? Does TVA check that the CQ PAMS system meets the requirements in its purchase specifications? | Closed | ML101970033, Item No. 1 & 2 | TVA Letter dated 10/5/10 | Are these connections already docketed? |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | dated November 2010<br>3. WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," dated November 2010, submitted in TVA to NRC letter December 3, 2010<br><br>Review of the newly released Common Q PAMS documents listed below confirmed they correctly show a connection from the OM to a printer and not the plant computer. None of the other newly released documents contain a figure of the Common Q PAMS system showing the connection from the OM. The exception is WCAP-17351 which was created to allow a non-proprietary version of a generic Common Q document to be submitted on the docket and was not intended to reflect the WBN Unit 2 configuration.<br><br>Note: The OM printer connection is only used for maintenance. A printer is not normally connected to the OM. To use the OM printer connection, the FE keyswitch must installed and be in the "ENABLE" position.<br>(1) WNA-TP-02988-WBT, Revision 0, "Post Accident Monitoring System Channel Integration Test/Factory Acceptance Test," dated November 2010, submitted in TVA to NRC letter December 3, 2010 (Reference 1)<br>(2) WNA-AR-00180-WBT-P, Revision 0, "Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System," dated October 2010, submitted in TVA to NRC letter November 5, 2010 (Reference 12) | | | | | | |
| **188** | | | EICB (Carte) | By letter dated June 30, 2010, TVA docketed, "Tennessee Valley Authority (TVA) Watts Bar Unit 2 (WBN2) – Post-Accident Monitoring System (PAMS) Licensing Technical Report," (Document Number WNA-LI-00058-WBT- P, Revision 0, June 2010) (Westinghouse Proprietary Class 2).<br><br>1) Figure 2.2-1 of the PAMS Licensing Topical Report does not show any connection between the Operators Modules and the plant computer or printer; however, Figure 2.1-1 of the PAMS System Requirements Specification (WNA-DS-01617-WBT Rev. 1 – ML101680578) shows a TCP connection from the OMs to the plant computer and printer. Please explain.<br><br>2) Section 5.3, "Response to individual criteria in DI&C-ISG-04," of the PAMS Licensing Topical Report does not address the TCP connection between the OM and non-safety components depicted in Figure 2.1-1 of the PAMS System Requirements Specification (WNA-DS-01617-WBT Rev. 1 – ML101680578). Please explain. | Responder: Clark<br><br>1) The original design was to allow printing from both the Operator Module (OM) and Maintenance and Test Panel (MTP) via the plant computer. This required both to be connected to the plant computer. Westinghouse did not perceive this as an issue, because the standard Common Q PAMS design includes both the flat panel displays and individual control panel indicators. The Westinghouse Common Q team did not realize that WBN does not use the individual control panel indicators. As a result, the original design documents provided by Westinghouse included the connection from the OM to the plant computer.<br><br>The TVA team did not realize that the Westinghouse design relied on the OM and MTP to be qualified isolation devices that protected the AC160 functions and individual control panel indicators from interference from the plant computer. It was not until a meeting was held to discuss the design of the OM that the issues came to light. That was when Westinghouse understood that the OM was the PAMS display and WBN did not use individual control panel indicators and TVA understood that the OM was being credited as the "qualified isolation device". It became apparent at the meeting to both TVA and Westinghouse that the original design was not acceptable. The team then agreed to delete the OM connection to the plant computer.<br><br>2) This is a duplicate of closed RAI Matrix Item 45. | 177. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>NNC 08/25/10: See Open Item No. 187. | Closed<br><br>to Open Item 187 | ML101970033, Item No. 3 & 4 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **189** | | 7.6.7 | EICB (Singh) | 7/20/2010<br><br>FSAR Section 7.6.7States: "Conformance with Regulatory Guide 1.133, Revision 1 is discussed in Table 7.1-7." FSAR Chapter 7 does not contain any such numbered table. Please explain. | Responder: Clark<br><br>This is a typographical error. The correct reference is Table 7.1-1. The reference will be corrected in FSAR Amendment 100. | 178. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>NNC 8/25/10: Acceptable response. | Closed<br><br>By FSAR Amendment 100, page 7.6-4. | RAI No. 3 ML102980005 10/26/2010 | TVA Letter dated 10/5/10 | |
| **190** | 7.9 | | EICB (Singh) | FSAR Table 7.1-1 states: "Regulatory Guide 1.133, May 1981 "Loose-Part Detection Program for the Primary System of Light–Water Cooled Reactors", Revision 1 (See Note 12)…Note 12 Conforms except as noted below…Positi[o]ns C.3.a.(3) and C.5.c. recommend a channel calibration be performed at least once pe[r] 18 months. In lieu of this recommendation, the DMIMS will be calibrated at the frequency stated in subsection TSR 3.3.6.3 of TR 3.3.6 (Loose-Part Detection System)."<br><br>1) Clarify what frequency is specified in TSR 3.3.6.3.<br><br>2) Please explain why the stated calibration frequency is adequate for meeting regulatory requirements.<br><br>3) Please provide sufficient documentation for the NRC to independently evaluate the conformance claims stated in the FSAR. | Responder: Clark<br><br>1) TSR 3.3.6.3 specifies 18 months as the calibration frequency.<br><br>2) Per the Technical Requirements Manual (TRM) Bases 3.3.6 (Attachment 9) the surveillance requirements and frequency are provided in Regulatory Guide 1.133, "Loose-Part Detection Program for the Primary System of Light-Water-Cooled Reactors."<br><br>3) TRM section 3.3.6 and it's bases are contained in Attachment 9 to the 10/5/10 response letter. | 179. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>to Open Item 331.<br><br>TVA letter of 10/5/2010, Item 55 provided the response.<br><br>FSAR conformance claims open items addressed in OI No. 331 . | RAI No. 4 ML102980005 10/26/2010 | TVA Letter dated 10/5/10 | Closed to OI-331. |
| **191** | 7.9 | | EICB (Carte) | NUREG-0800 Chapter 7, Section 7.9, "Data Communication Systems" contains review criteria for data communication systems. The WBN2 FSAR did not include any description of data communications systems.<br>1) Please identify all data communications systems.<br>2) Please describe each data communications system identified above.<br>3) Please provide a regulatory evaluation of each data communications system against the applicable regulatory criteria. | Responder: Jimmie Perkins<br><br>WBN Unit 2 is in compliance with the regulatory requirements for data communications systems as described in Attachment 34 (Data Communications Systems Description and Regulatory Compliance Analysis). | 180. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>NNC 8/25/10: Information received, and read. | Closed | ML10197016, Item Nos. 1-3 | TVA Letter dated 10/5/10 | |
| **192** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | The NRC Staff is using SRP (NUREG-0800) Chapter 7 Section 7.5, "Instrumentation Systems Important to Safety," to review the WBU2 FSAR Section 7.5, "Instrumentation Systems Important to Safety." The following requests are for information that the SRP directs the reviewers to evaluate.<br><br>The role of the EICB Technical reviewer is to determine if there is reasonable assurance that the equipment will perform the required functions. The WBU2 FSAR, Section 7.5.2, "Plant Computer System," does not contain any description of the equipment that performs the functions described in the section. Enclosure 1 Item 3 of letter dated March 12, 2010, TVA stated that the "platform" of the "Process Computer" was, "Hewlett Packard RX2660 and Dell Poweredge R200 servers with RTP Corp 8707 I/O." In addition TVA provided (a) two pages of marketing literature by DELL on the Poweredge R200 Server, (b) the "HP Integrity rx2660 Server Unser Service Guide," and (c) the Integrated Computer System Network Configuration Connection Diagram (2-45W2697-1-1 dated 8/27/09). This provided information is not sufficient for evaluating whether the equipment will, with reasonable assurance, perform the functions described in the FSAR.<br><br>1) Is the "Plant Computer System" another name for the "Process Computer"? | Responder: Clark<br><br>1. At WBN Unit 1 and 2, there is a single computer system named the "Integrated Computer System" or ICS. That system is sometimes described as the "Plant Computer System", the "Process Computer", the Technical Support Center Data System (TSCDS) or the Emergency Response Facility Data System (ERFDS). At one time, the TSCDS and ERFDS were separate computers on Unit 1 but their functions were all incorporated into the ICS when it was installed.<br><br>2. The Watts Nuclear Plant ICS is a non-safety related system, is designed as a single, large-scale nuclear plant computer system which integrates balance of plant (BOP) monitoring with extensive nuclear steam supply system (NSSS) application software into a comprehensive computer based tool for plant operations. The system is comprised of the following major components:<br>• Remote multiplexers in the Computer Room, Auxiliary Instrument Room and 480V Board rooms.<br>• Redundant Central Processing Units (CPUs)<br>• Data Storage Devices<br>• Man-Machine Interfaces (MMI) – Satellite Display Stations | 181. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>August 19, 2010 - NRC to review TVA response.<br><br>TVA letter dated10/5/10 Response 57 provided information. | Closed<br><br>NRC to issue formal RAI to TVA. | Item No. 1 sent to DORL 7/20/2010 ML102010034. EICB RAI ML102861885 Item No. 1 | TVA Letter dated 10/5/10 | EICB RAI ML1028618855 sent to DORL. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2) Please provide an architectural description of the Plant Computer System.<br><br>3) Please describe the relationship between the Plant Computer System and the Integrated Computer System. | (SDS) terminals in the Main Control Room (MCR), Technical Support Center (TSC) and Computer Room.<br>• Networking equipment including switches, firewalls and terminal servers<br>• Printers<br>• Data Links to other plant computer devices (serial and network)- These systems or devices include but are not limited to:<br><br>o System Foxboro I/A Systems (unit 2 only)<br>o Areva Beacon core monitoring systems<br>o Multi-pen recorders<br>o Landis & Gyr switchyard monitoring system<br>o Computer Enhanced Rod Position Indication (CERPI)<br>o Eagle 21<br>o Ronan Annunciator<br>o Leading Edge Flow Meter (LEFM)<br>o Bentley-Nevada vibration monitoring system<br>o Inadequate Core Cooling Monitor (ICCM) (unit 1 only)<br>o Common Q (unit 2 only)<br>o WINCISE (unit 2)<br>o Plant Engineering Data System (PEDS)<br><br>In support of normal plant operations, each unit's ICS:<br>• Scans and converts analog and digital plant process inputs to engineering units for displaying, alarming and reporting.<br>• Receives analog and digital inputs as pre-processed values from other digital systems for displaying, alarming, archiving, and reporting.<br>• Performs data validity checking.<br>• Performs calculations to obtain parameters such as difference, flows, and rates.<br>• Displays alarms when data point value exceeds predefined set points.<br>• Displays alarms received from the digital Annunciator system.<br>• Generates periodic station logs and pre-selected special logs.<br>• Performs BOP and NSSS related calculations.<br>• Provides graphical and digital trending displays of plant data.<br>• Provides graphical P&ID type displays of plant data.<br><br>In support of emergency plant operations each unit's ICS:<br>• Provides plant emergency support with the Safety Parameter Display System (SPDS) functions based upon the Westinghouse Owner's Group CSF status trees and historical data collection, storage, and retrieval functions required to support NUREG-0737 and NUREG-0737, Supplement 1 category 1 variables (except for containment isolation).<br>• Provides SPDS and Emergency Response Data System (ERDS) data to the Emergency Offsite Facilities via PEDS.<br>• Provides BISI functions (not including operating and trip bypasses of RPS and ESFAS).<br>• Provides continuous monitoring of RHR system performance when RHR is in use.<br><br>ICS is not required to be safety-related and is not required to | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | meet IEEE single-failure criteria for Class 1E equipment.<br><br>3. The Plant Computer System and the Integrated Computer System are the same system. | | | | | | |
| **193** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | The WBU2 FSAR, Section 7.5.2, "Plant Computer System," contains three subsections,<br>7.5.2.1, "Safety Parameter Display System"<br>7.5.2.2, "Bypassed and Inoperable Status Indication System (BISI)"<br>7.5.2.3, "Technical Support Center and Nuclear Data Links"<br><br>Are there three separate sets of hardware that implement these functions, or are these three functions that are implemented on a single set of hardware? | Responder: Clark<br><br>There is a single set of hardware that incorporates the functionality of Safety Parameter Display System (SPDS), Bypass and Inoperable Status Indication System (BISI) and the Technical Support Center (TSC).<br><br>Also refer to the response to item 59 (RAI Matrix Item 193).<br><br>The function of the Nuclear Data Links or Emergency Response Data System (ERDS) is actually provided by the TVA Central Emergency Control Center (CECC) which acts as the Emergency Offsite Facility (EOF) for all of TVA's nuclear units. Plant data will be sent on a periodic basis from the ICS to the CECC via the Plant Engineering Data System (PEDS). That data is then available to be sent from the CECC to the NRC. | 182. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>TVA letter dated 10/5/10 Responses 58 and 67 provided information. | Closed<br><br>NRC to issue formal RAI to TVA. | Item No. 2 sent to DORL 7/20/2010 ML102010034 EICB RAI ML102861885 Item No. 2 | TVA Letter dated 10/5/10 | EICB RAI ML1028618855 sent to DORL. |
| **194** | 7.5.1.1 .1 | 7.5.2.1 | EICB (Marcus) | The WBU2 FSAR Section 7.5.2.1, "Safety Parameter Display System," contains a description of the Safety Parameter Display System.<br><br>SRP Section 7.5, Subsection II, "Acceptance Criteria" states: Requirements applicable to the review of SPDS…10 CFR 50.55a(a)(1), "Quality Standards."<br><br>Please provide a description of how SPDS meets this regulatory requirement. | Responder: Costley/Norman<br><br>The principal purpose and function of the SPDS is to aid control room personnel during abnormal and emergency conditions in determining the safety status of the plant and in assessing if abnormal conditions require corrective action by the operators to avoid a degraded core. It also operates during normal operations, continuously displaying information from which the plant safety status can be readily and reliably accessed.<br><br>To ensure quality, the design, testing, and inspection of the SPDS is controlled by qualified personnel and by using TVA procedure SPP-2.6, "Computer Software Control". The procedure details controls and processes required for the development, modification, and configuration management of computer software used to support the design, operation, modification, and maintenance of TVA's nuclear power plants consistent with the Nuclear Quality Assurance Plan.<br><br>This ensures that the design and operation of the SPDS complies with the 10 CFR 50.55a(a)(1) quality standards requirements. The controls and processes outlined in the procedure provide assurance that the SPDS will perform its intended function correctly.<br><br>The plant Integrated Computer System(ICS) provides the SPDS for WBN. Any changes to the SPDS software must be documented and controlled using a Software Service Request(per SPP-2.6) and must be implemented under the engineering design change process(Design Change Notice, DCN). Controls in SPP-2.6 guide the development and testing of the SPDS changes.<br><br>Other controls put in place by this procedure to further maintain quality standards are:<br>• Changes to SPDS software from remote locations is | 183. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>TVA letter dated 10/5/10 Response 59 provided information. | Closed<br><br>NRC to issue formal RAI to TVA. | Item No. 3 sent to DORL 7/20/2010 ML102010034 EICB RAI ML102861885 Item No. 3 | TVA Letter dated 10/5/10 | EICB RAI ML1028618855 sent to DORL. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | prohibited.<br>• The application custodian implements controls to prevent unauthorized changes to the software.<br>• Changes are made in a non-production environment and validation testing takes place before the change is installed on the ICS.<br>• Once validation testing begins, the source code is placed under configuration control.<br>• When the modifications are installed on the ICS, an operability test is performed to demonstrate that the software is installed correctly and is functioning correctly in its operating environment.<br>• All documentation related to the SPDS software changes are QA records.<br>• The software source code is kept in a physically secure, environmentally controlled space to prevent inadvertent changes.<br>• Cyber security considerations are also considered in the storage environment.<br><br>The data goes through several validation steps before being presented to the operators. When redundant sensors are used, the data received by the computer can be processed by software to determine if the quality of one or more points is questionable. | | | | | | |
| **195** | 7.5.1.1 .2 | 7.5.2.2 | EICB (Marcus) | Bypassed and Inoperable Status Indication (BISI)<br><br>The WBU2 FSAR Section 7.5.2.2, “Bypassed and Inoperable Status Indication System (BISI),” contains a description of the Bypassed Inoperable Status Indication System (BISI).<br><br>SRP Section 7.5, Subsection II, “Acceptance Criteria” states: Requirements applicable to bypassed and inoperable status indication …10 CFR 50.55a(a)(1), “Quality Standards.”<br><br>Please provide a description of how BISI meets this regulatory requirement. | Responder: Costley/Norman<br><br>The BISI system is a computer based system that provides automatic indication and annunciation of the abnormal status of each ESFAS actuated component of each redundant portion of a system that performs a safety-related function.<br><br>To ensure quality, the design, testing, and inspection of the BISI system is controlled by qualified personnel and by using TVA procedure SPP-2.6, “Computer Software Control”. The procedure details controls and processes required for the development, modification, and configuration management of computer software used to support the design, operation, modification, and maintenance of TVA’s nuclear power plants consistent with the Nuclear Quality Assurance Plan.<br><br>This ensures that the design and operation of the BISI System complies with the 10 CFR 50.55a(a)(1) quality standards requirements. The controls and processes outlined in the procedure provide assurance that the BISI system will perform its intended function correctly.<br><br>The plant Integrated Computer System(ICS) provides the BISI system for WBN. Any changes to the BISI software must be documented and controlled using a Software Service Request(per SPP-2.6) and must be implemented under the engineering design change process(Design Change Notice, DCN). Controls in SPP-2.6 guide the development and testing of the BISI changes.<br><br>Other controls put in place by this procedure to further maintain quality standards are: | 184. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>TVA letter dated 10/5/10 Response 60 provided information. | Closed<br><br>NRC to issue formal RAI to TVA. | Item No. 4 sent to DORL 7/20/2010 ML102010034 EICB RAI ML102861885 Item No. 4 | TVA Letter dated 10/5/10 | EICB RAI ML1028618855 sent to DORL. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | • Changes to BISI software from remote locations is prohibited.<br>• The application custodian implements controls to prevent unauthorized changes to the software.<br>• Changes are made in a non-production environment and validation testing takes place before the change is installed on the ICS.<br>• Once validation testing begins, the source code is placed under configuration control.<br>• When the modifications are installed on the ICS, an operability test is performed to demonstrate that the software is installed correctly and is functioning correctly in its operating environment.<br>• All documentation related to the BISI software changes are QA records.<br>• The software source code is kept in a physically secure, environmentally controlled space to prevent inadvertent changes.<br>• Cyber security considerations are also considered in the storage environment. | | | | | | |
| **196** | 7.5.1.1 .2 | 7.5.2.2 | EICB (Marcus) | Bypassed and Inoperable Status Indication (BISI)<br><br>The NRC staff is performing its review in accordance with LIC-110, Rev. 1, "Watts Bar Unit 2 License Application Review." LIC-110 directs the staff to review systems unique to Unit 2 in accordance with current staff guidance. Regulatory Guide (RG) 1.47 Revision 1, "Bypassed and Inoperable Status indication for Nuclear Power Plant Safety Systems," is the current regulatory guidance for BISI. Please provide a regulatory evaluation of BISI against the current RG. | Responder: Costley/Norman<br><br>Section C of the Regulatory Guide lists the following six regulatory positions for guidance to satisfy the NRC requirements with respect to the bypassed and inoperable status indication(BISI) for nuclear power plant safety systems:<br><br>1. Administrative procedures should be supplemented by an indication system that automatically indicates, for each affected safety system or subsystem, the bypass or deliberately induced inoperability of a safety function and the systems actuated or controlled by the safety function. Provisions should also be made to allow the operations staff to confirm that a bypassed safety function has been properly returned to service.<br><br>Response: The BISI system provides indication(displays and annunciation) that a functional path for each train of a safety system or support system has been rendered in a state which could cause inoperability. The BISI system monitors and provides system level alarms for these plant safety-related systems:<br><br>• Main and Aux Feedwater<br>• Safety Injection<br>• Residual Heat Removal<br>• Containment Spray<br>• Emergency Gas Treatment<br>• Essential Raw Cooling Water<br>• Chemical and Volume Control<br>• Ventilating<br>• Component Cooling<br>• Control Air( including Aux Control Air)<br>• Standby Diesel Generator<br><br>The system level displays/indicating lights indicate the | 185. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>TVA letter dated 10/5/10 Response 61 provided information. | Closed<br><br>NRC to issue formal RAI to TVA | Item No. 5 sent to DORL 7/20/2010 ML102010034 EICB RAI ML102861885 Item No. 5 | TVA Letter dated 10/5/10 | EICB RAI ML1028618855 sent to DORL. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | status of each system's train functional path as well as the status of any support system that might put the system in an inoperable or bypassed condition.<br><br>The BISI system software runs on the Integrated Computer System(ICS) and it provides the capability to monitor in real time the parameters required to provide a BISI system as described in the Reg Guide.<br><br>The system level display or indicating lights indicate "NORMAL" status when a previously bypassed system returns to normal operational status. The Operations staff will determine the impact of each alarm on the process flow path indication during plant modes of operation. The final decision of system operability is left up to the Operations staff to determine per Technical Specifications.<br><br>2. The indicating system for BISI should also be activated automatically by the bypassing or the deliberately induced inoperability of any auxiliary or supporting system that effectively bypasses or renders inoperable a safety function and the systems actuated or controlled by the safety function.<br><br>Response: The Integrated Computer System(ICS) obtains real-time plant parameter information system by continuously scanning pre-assigned analog, pulse, and contact sensors located throughout the plant to provide status information to the BISI system and automatically displays that information on the BISI terminals in the Main Control Room. Alarms are also initiated to gain the Operations staff's attention.<br><br>3. Annunciating functions for system failure and automatic actions based on the self-test or self-diagnostic capabilities of digital computer-based I&C safety systems should be consistent with Positions 1 and 2.<br><br>Response: The data goes through several validation steps before being presented to the operators. When redundant sensors are used, the data received by the computer can be processed by software to determine if the quality of one or more points is questionable.<br><br>4. The bypass and inoperable status indication system should include a capability for ensuring its operable status during normal plant operation to the extent that the indicating and annunciating functions can be verified.<br><br>Response: The BISI system is designed to operate during all normal plant modes of operations including startup, shutdown, standby, refueling, and power operation. The ICS is designed to provide a very high degree of reliability and the accuracy of the displayed data is not significantly less than the accuracy of comparable data displayed in the Main Control Room.<br><br>5. Bypass and inoperable status indicators should be arranged such that the operator can determine whether continued reactor operation is permissible. The control room | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | of all affected units should receive an indication of the bypass of shared system safety functions.<br><br>Response: A system level display via the BISI display or indicating lights is provided to the operators to indicate the status of the systems being monitored as well as any support systems. If an alarm condition exists, additional detailed information is provided to the operations staff so as to allow determination of the abnormal condition. The information provided will identify to the Operations staff the exact nature of the initiating condition for the abnormal alarm. Each BISI system point will allow the user to access a detailed system screen.<br><br>These indicators and alarms will provide critical information to help the operations staff determine whether continued reactor operation is/is not permissible. As stated previously, the final decision of system operability/inoperability is left to the Operations staff to determine per Technical Specifications.<br><br>6. Bypass and inoperable status indicators should be designed and installed in a manner that precludes the possibility of adverse effects on plant safety systems. The indication system should not be used to perform functions that are essential to safety, unless it is designed in conformance with criteria established for safety systems.<br><br>Response: The BISI system is not designed to safety system criteria and therefore is not to be used to perform functions essential to the health and safety of the public, nor are operator actions based solely on BISI indications.<br><br>Appropriate electrical and physical isolation from safety-related equipment to the non-safety system is provided to meet the requirements identified in the FSAR. The ICS is independent of existing sensors and equipment in safety-related systems. Independence is achieved through qualified safety-related Class 1E isolators. The ICS is also isolated to preclude electrical or electronic interference with existing safety systems.<br><br>Inputs and outputs are isolated from the plant inputs such that normal faults on the plant side of the loops will have no adverse impact on the ICS other than loss of the one circuit with the fault. The inputs/outputs meet the isolation requirements of Watts Bar Design Criteria WB-DC-30-4, Separation/Isolation, which defines the design requirements for electrical separation/isolation of the distribution equipment and wiring for Class 1E electrical systems and components in the plant. | | | | | | |
| **197** | | | X | Open Item 197 was never issued. | | 186. Y | Closed | Closed | | | |
| **198** | 7.5.1.1 .2 | 7.5.2.2 | EICB (Marcus) | SRP Section 7.5, Subsection III, “Review Procedures” states: Recommended review emphasis for BISI<br>F. Scope of BISI indications - As a minimum, BISI should be provided for the following systems:<br>- Reactor trip system (RTS) and engineered safety features actuation system (ESFAS) - See SRP Appendix 7.1-B subsection | Responder: Costley/Norman<br><br>F. The scope of the WBN BISI indications are based on engineering calculation WBPEVAR8807025 Rev. 7 (Attachment 10). This calculation has not been updated for Unit 2. The calculation does include Common and Unit 2 | 187. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>TVA letter dated 10/5/10 | Closed<br><br>NRC to issue formal RAI to TVA | Item No. 6 sent to DORL 7/20/2010 ML102010034 EICB RAI ML102861885 Item No. 6 | TVA Letter dated 10/5/10 | EICB RAI ML1028618855 sent to DORL. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 4.13, “Indication of Bypasses,” and SRP Appendix 7.1-C subsection 5.8.3, “Indication of Bypasses.”<br>- Interlocks for isolation of low-pressure systems from the reactor coolant system - See SRP BTP 7-1.<br>- ECCS accumulator isolation valves - See SRP BTP 7-2.<br>- Controls for changeover of residual heat removal from injection to recirculation mode - See SRP BTP 7-6.<br>G. Conformance with Regulatory Guide 1.47, “Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems.”<br>H. Independence - See SRP Appendix 7.1-B subsection 4.7, “Control and Protection System Interaction,” and SRP Appendix 7.1-C subsections 5.6, “Independence,” and 6.3, “Interaction Between the Sense and Command Features and Other Systems.” The indication system should be designed and installed in a manner that precludes the possibility of adverse effects on plant safety systems. Failure or bypass of a protective function should not be a credible consequence of failures occurring in the indication equipment, and the bypass indication should not reduce the required independence between redundant safety systems.<br>I. Use of digital systems - See SRP Appendix 7.0-A and Appendix 7.1-D.<br><br>Please provide a description of how BISI meets each item above, or provide appropriate justification for not doing so. | equipment required to support Unit 1 operation.<br>G. Compliance to Regulatory Guide 1.47 is described in design criteria document WB-DC-30-29 Rev. 8, Integrated Computer System (submitted under TVA letter dated August 11, 2010 (Reference 1)) which is a design input to calculation WBPEVAR8807025 Rev. 7.<br>H. Design criteria document WB-DC-30-29 Rev. 8, Integrated Computer System submitted under TVA letter dated August 11, 2010 (Reference 1)) section 3.4.1, BISI Design and Operation states: “The BISI shall not be designed to safety related system criteria and therefore is not to be used to perform functions essential to the health and safety of the public. Class 1E isolation is required, however, to maintain the independence of safety related equipment and systems.”<br>I. Development of the Bypassed and Inoperable Status Indication (BISI) application of the Integrated Computer System (ICS) is performed in accordance with NPG SPP 2.6, Computer Software Control, Rev. 12 (Attachment 35). The development process starts with classifying the application depending on how the output of the software will be used. BISI software is currently classified as category ‘C’ in accordance with . Appendix B which defines Category C as:<br><br>Application Software Categories<br>Category Description<br><br>C Software and data which are an integral part of a quality-related but not safety-related plant system or component and are essential to the performance of that function.<br><br>Software, portions of software, and data essential to the implementation of quality-related programs listed in Section 5.1.B of the Nuclear Quality Assurance Plan, including software used to implement regulatory physical security requirements.<br><br>Software and data which implements NQAP requirements but not specifically identified as an augmented quality-related program as defined in Section 5.1.B of the NQAP.<br><br>Software, not associated with a specific plant system, which stores, maintains, controls, distributes or manages data which can be used without further verification in activities which affect safety- or quality- related plant structures, systems, and components.<br><br>Software, portions of software, and data which are an integral part of a non safety-related, non-quality related plant system or component whose failure would significantly impact plant operations.<br><br>Software used in the design of non quality-related, non safety-related plant structures, systems, and components<br><br>Based on category C classification, SPP 2.6, Annex C defines the documentation that is required for the software.. | | Response 62 and Attachments 10 and 35 provided information. | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | For BISI, a Software Requirements Specification (SRS) based on the engineering calculation will be generated along with a Software Design Description. A Software Verification and Validation Report (SVVR) consisting of a Validation Test and results and an Operability Test and results will be prepared. User documentation for BISI will be incorporated into the overall ICS user documents.<br><br>Future changes to BISI will be driven foremost by changes to the engineering calculation that defines the overall functionality of the system. Any changes to the engineering calculation will cause a Software Services Request (SSR) to be generated. Depending on the scope of the change, the various documents (SRS, SDD, SVVR and user documentation) will be updated or re-issued. | | | | | | |
| **199** | 7.5.1.1 .3 | 7.5.2.3 | EICB (Marcus) | The WBU2 FSAR Section 7.5.2.3, "Technical Support Center and Nuclear Data Links," contains a description of the Technical Support Center and Nuclear Data Links.<br><br>SRP Section 7.5, Subsection II, "Acceptance Criteria" states: Requirements applicable to the review of…ERF information systems, and ERDS information systems …10 CFR 50.55a(a)(1), "Quality Standards."<br><br>Please provide a description of how the nuclear data links meets this regulatory requirement. | Responder: Costley/Norman<br><br>The Technical Support Center is intended to be an accident mitigation support center and provides Satellite Display Stations (SDS) capable of displaying information on plant systems for Unit 1, Unit 2 or the Simulator. Stations in the TSC receive data from the plant Integrated Computer System (ICS) over the ICS network. Separate PCs receive data from the simulator computer over the WBN site network to support drills and training exercises. Those PCs can also access the Plant Engineering Data System (PEDS) as a backup to ICS. The TSC also has a separate computer that connects to the CECC to allow additional access to meteorological station.<br><br>The ICS data is also transmitted from the PEDS server through the PEDS Firewall over the WBN Site Network to the CECC computers (Chattanooga). The CECC computers transmit the data over the TVA Corporate Network, through the TVA Firewall (provided by NRC), through the NRC Firewall to the NRC. Transmission of this data from the ICS and Meteorological Station over data link (High Speed Communications Link) to the CECC and NRC meet the requirements of NUREG-0696, Functional Criteria for Emergency Response Facilities and NUREG-1394, Emergency Response Data System Implementation. | 188. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>TVA letter dated 10/5/10 Response 63 provided information. | Closed<br><br>NRC to issue formal RAI to TVA | Item No. 7 sent to DORL 7/20/2010 ML102010034 EICB RAI ML102861885 Item No. 7 | TVA Letter dated 10/5/10 | Related SE Section 7.5.5.3 EICB RAI ML1028618855 sent to DORL. |
| **200** | 7.2<br>7.3<br>7.5<br>7.7 | | EICB (Carte) | 7/21/2010<br><br>Amendment 99 of the Watts Bar Unit 2 FSAR Section 7.5, "Instrumentation Systems Important to Safety," does not include any description of instrumentation for normal operation; therefore, Section 7.5 of the FSAR does not support statements made in the SER Section 7.5; compare SER (ML072060490) Section 7.5.1 and FSAR Amendment 99 Section 7.5. Please identify where, in the docketed material, information exists to support the statements in the SER Section 7.5.1. | Responder: Clark<br>The statement in SER Section 7.5.1 is supported by the following:<br>• I&C Systems for Normal Operation FSAR Section<br>• Eagle 21 7.2<br>• Neutron Monitoring 7.2<br>• Foxboro Spec 200 7.3 (List of other sections in attachment 34)<br>• Foxboro I/A 7.7.11 (new section will be added by amendment 101) (other sections have been previously provided)<br>• Plant Computer 7.5.2<br>• Rod Control 7.7.1.2<br>• CERPI 7.7.1.2<br>• Control Rod Drive 7.7.1.1 | 189. Y | Closed | Closed | EICB RAI ML102980066 Item No. 2 | TVA Letter dated 10/5/10<br><br>Amendment 101 Submitted 10/29/10. | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | • Incore Neutron Monitoring 7.7.1.9<br>• Lose Part Detection/Monitoring 7.6.7<br>• Vibration Monitoring RCP 5.5.1.2<br>• Control Boards 7.1.1.10<br>• RVLIS 7.5, 5.6<br>• | | | | | | |
| **201** | 7.7.1.1 .1 | 7.7.11 | EICB (Carte) | 7/21/2010<br><br>Amendment 99, FSAR Section 7.7.1.1.1, "Reactor Control Input Signals (Unit 2 Only)," contains a description of functions performed uniquely for Unit 2. Please describe the equipment that performs this function (in sufficient detail to support a regulatory evaluation), and evaluate this equipment against the appropriate regulatory criteria. | Responder: Webb<br><br>These functions are within the scope of the Foxboro I/A system. Section 7.7.11 will be added to the FSAR in amendment 101 to provide a discussion of the DCS. | 190. Y | Closed | Closed | EICB RAI ML102980066 Item No. 3 | TVA Letter dated 10/5/10<br><br>Amendment 101 Submitted 10/29/10. | |
| **202** | 7.5.2 | | EICB (Carte) | 7/22/2010<br><br>The letter (ML0003740165) which transmitted the Safety Evaluation for the Common Q topical report to Westinghouse stated: "Should our criteria or regulations change so that our conclusions as to the acceptability of the report are invalidated, CE Nuclear Power and/or the applicant referencing the topical report will be expected to revise and resubmit their respective documentation, or submit justification for continued applicability of the topical report without revision of the respective documentation." Question No 81 identified many criteria changes; please revise the respective documentation or submit justification for continued applicability of the topical report. | Responder: WEC<br><br>Revision 1 of the Licensing Technical Report will provide more detailed information on the changes to the platform.<br><br>Rev. 2 of the Licensing Technical Report will include the applicability of guidance.<br><br>**TVA Response to Follow-up NRC Request:**<br>WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" (LTR) submitted in TVA Letter to NRC dated December 3, 2010, contains the following change to address the NRC request:<br><br>Section 9, "Compliance Evaluation of the Watts Bar 2 PAMS Software Requirements Specification to IEEE Standard 830-1998 and Regulatory Guide 1.172" to show the origin of the requirements has been added.<br><br>The descriptions and commitments in the Topical Report (TR) still apply. The LTR provides compliance evidence to the new ISG-04 criteria. The statement in the SE means that the TR can be evaluated against later NRC criteria when it appears.<br><br>Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010<br><br>**Partial TVA Response to Follow-up NRC Request:**<br><br>Attachment 4 contains the results of the TVA analysis of standards and regulatory guides applicable to the Common Q PAMS. Based on the results of the analysis, the Common Q PAMS design is acceptable.<br><br>The final response is pending submittal of the Licensing Technical Report Revision 3 scheduled for March 29, 2011. | 13. N | Open<br>Response included in letter dated 12/22/10<br><br>Partial Response provided in letter dated 10/5/10<br><br>**NNC 1/5/11:** Summary provided in Licensing Technical Report R2 has been reviewed and found to be unacceptable.<br><br>LTR Section 9 evaluates the compliance of the SRS to IEEE 830-1998. There are two issues with this evaluiation:<br>(1) IEEE 830-1998 is not the current SRP acceptance criteria. IEEE 830-1998 has not been formally endorsed by a regulatory guide.<br>(2) Westinghouse committed to evaluate the SRS against 830 when the NRC identified several inconsistencies.<br><br>Yes ISG-4 is one new criteria, and an evaluation against it has been provided.<br><br>In addition, LTR Rev. 2 Section 13 states: "The applicable NRC regulatory guides, IEEE and EPRI industry standards fo the common Q PAMS are shown below. Compliance to these codes and standards are stated in Section 4 of Reference 1." Reference 1 is the common Q topical report. | Open-TVA/WEC<br><br>**Due 2/25/11 & 3/29/11**<br><br>to provide information requested.<br><br>Due TBD | EICB RAI ML102980066 Item No. 4 | TVA Letter dated 10/5/10 | **NNC 1/5/11:** See Also Open Item No. 81 and 86. |
| **203** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | 7/26/2010<br><br>By letter dated April 27, 2010 (ML101230248), TVA stated | Responder: Clark<br><br>The plant computer system is one set of hardware. The | 191. Y | Closed<br><br>Response provided in letter | Closed<br><br>NRC to issue formal | EICB RAI ML102861885 Item No. 9 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (Enclosure Item No.19): "The WBN Unit 2 Integrated Computer System(ICS) modification merges the ERFDS and plant computer into a single computer network."<br><br>FSAR Section 7.5.2, "Plant Computer System," has three subsections:<br>7.5.2.1, "Safety Parameter Display System"<br>7.5.2.2, "Bypassed and Inoperable Status Indication System (BISI)"<br>7.5.2.3, "Technical Support Center and Nuclear Data Links"<br>This arrangement implies that the each of these function are part of the plant computer, and not a separate sets of equipment. Please describe the equipment for each function and identify any equipment common to more than one function. | "Safety Parameter Display System", "Bypassed and Inoperable Status Indication System (BISI)", "Technical Support Center and Nuclear Data Links" are all functions of the Plant Computer System. Historically the Westinghouse P2500 Plant Process Computer and Emergency Response Facilities Data System (ERFDS) were individual systems but were merged together with the implementation of DCN 39911-A, implemented for WBN Unit 1 in December 1998, to become the Plant Integrated Computer System (ICS). A similar system is being installed for WBN Unit 2 based on the same software with more modern hardware.<br><br>The ICS is composed of a number of pieces of hardware, all utilized as a system, to provide the functions listed in the FSAR sections 7.5.2.1, 7.5.2.2 and 7.5.2.3. This hardware includes but is not limited to Hewlett Packard (HP) servers (CPU), DELL servers (CPU), Fiber Optic Panels, Fiber Optic Converters, Switches, Firewalls, Network Taps, Multiplexors (RTP), LCD displays and fiber optic and copper Ethernet cables. As all the applicable hardware make up the "system" it is all common to more than one function and there is no separate set of equipment for any of the functions referenced in FSAR Section 7.5.2.1 and 7.5.2.2.<br><br>The Nuclear Data Link and EOF functions described in 7.5.2.3 are provided by the CECC in Chattanooga. In order for the CECC to have access to ICS data, both the PEDS and the data diode isolating the PEDS from the ICS must be operational.<br><br>Meteorological data from the Environmental Data Station (EDS) is gathered by the Unit 1 ICS. That data is sent over to the unit 2 ICS via the inter-unit firewall. | | dated 10/5/10<br><br>TVA letter dated 10/5/10 Response 67 provided information. | RAI to TVA | | | |
| **204** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | 7/26/2010<br><br>By letter dated March 12, 2010 (ML101680577) TVA provided drawing No. 2-45W2697-1-1, "Integrated Computer System Network Configuration Connection Diagram," that depicts three "Data Diodes. Please provide a detailed description of the equipment, software, and configurations of each "Data Diode". | Responder: Costley/Norman<br><br>1. Three data diodes.<br>2. Two provide an interface between train A and B of Common Q.<br>a. These are identical systems consisting of the following:<br>i. Dual DELL R200 computers<br>ii. Red Hat Enterprise Linux software that is locked down by CTI<br>iii. 55 Mbs Owl cards<br>iv. Fiber optic Ethernet interface to trained Maintenance test panel<br>b. Software is configured to allow only specific traffic from the MTP to pass through to the ICS<br>c. The secure side of the data diode will initiate the connection to the MTP, so there will be a bidirectional connection between the secure side of the data diode and the MTP. There will be no bidirectional data flow from the ICS to the MTP since the diode will block all incoming traffic from the ICS.<br>3. The third data diode is placed between the two ICS systems and the two PEDS computer systems.<br>a. Hardware is identical to that used by TVA in other plants<br>i. Dual HP DL360GS computers | 192. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>10/5/10 TVA letter Response 68 provided information.<br><br>Response is acceptable. | Closed<br>NRC to issue formal RAI to TVA | EICB RAI ML102861885 Item No. 10 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ii. Red Hat Enterprise Linux software that is locked down by CTI<br>iii. 155 Mbs OWL cards<br>iv. RJ45 Ethernet to PEDS network<br>b. Diode is configured to allow certain types of data to flow from the ICS network to the PEDS network. This includes but is not limited to the following:<br>i. Once per second current values and qualities for all points<br>ii. History data archived by the ICS<br>iii. Data files<br>c. The data diode does not allow any data to be transferred between the PEDS network and the ICS network. | | | | | | |
| **205** | | | EICB (Garg) | 7/26/2010<br><br>Regarding the Foxboro Spec 200 system installed at Unit 2:<br><br>a- Is it similar to Unit 1? If not, identify the differences and evaluation of the acceptability of these differences.<br><br>b- deleted<br><br>c- For each system which is discussed in the FSAR and utilizes the Spec 200 system, please provide the instrument logic diagram, loop/block diagram with reference to where the system is discussed in the FSAR. | Responder: Clark<br><br>As discussed at the August 3 and 4 meeting in Knoxville between TVA and the NRC, the Foxboro Spec 200 is not a system. The Foxboro Spec 200 analog hardware is used to replace the existing obsolete hardware with the same functions. There are no interconnections between the analog loops unless such interconnections existed prior to the replacement. This is strictly an analog to analog upgrade due to equipment obsolescence. The Foxboro hardware is installed in existing cabinets which require modifications to accept the Foxboro hardware racks.<br><br>a- A listing of the replacements and differences was previously provided as Attachment 1 to TVA letter to the NRC dated June 18, 2010. Within Unit 1, only portions of the AFW controls were replaced. In Unit 2 all safety-related analog loops were replaced. The Foxboro Spec 200 is a fully qualified industry standard for replacement of obsolete analog instrument and control loop hardware.<br><br>b- deleted<br><br>c- c- The Foxboro Spec 200 hardware has not been installed. Therefore the revised drawings have not been issued. Based on this, EDCR excerpts for the logic diagrams and loop/logic drawings were provided as attachments to TVA letter to the NRC dated July 30, 2010. The cross reference between the functions upgraded as part of the Foxboro Spec 200 change is contained in Attachment 33. | 193. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>TVA to respond or provide proposed date of response.<br>10/14 | EICB RAI ML102910008 Item#22 | TVA Letter dated 10/5/10 | Question B related to prior NRC approval of this system or 50.59 information. This question will be addressed in the August plant visit. |
| **206** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | 7/27/2010<br><br>The NRC Requested a description of the plant computer and TVA provided:<br>(1) Dell marketing literature for Dell Poweredge R200 Server, which can be found on the internet (http://www.dell.com/downloads/global/products/pedge/en/pe_R200_spec_sheet_new.pdf), and<br>(2) HP Integrity rx2660 Server User Service guide (edition 6), which has not yet been found on the internet, but many other editions have been found.<br>This information is not adequate for answering the question. (Note: TVA also provided a network configuration connection diagram, which is necessary but not sufficient.) | Responder: Clark<br><br>(1) The "Plant Computer" is not just a computer but is a system and is designated the Integrated Computer System or ICS. The ICS is composed of multiple computer CPUs, LCD displays, RTP Multiplexer Assemblies, network fiber optic panels, fiber optic converters, Ethernet switches and network taps previously described in items 71, 81 and 82 above. For a detailed discussion of the ICS functions refer to design criteria document WB-DC-30-29 Rev. 8, Integrated Computer System submitted under TVA letter dated August 11, 2010.<br><br>(2) As previously discussed in item 82, there is no unique set of hardware for any specific function. | 194. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>WB-DC-30-29 Rev. 8 is Enclosure 1 of TVA letter dated August 11, 2010 (ML102240382 letter and ML102240383 Enclosure 1).<br><br>10/5/10 TVA letter Response 70 provided information.<br><br>Response is acceptable | Closed<br><br>NRC to issue formal RAI to TVA | EICB RAI ML102861885 Item No. 11 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Please provide a description of the plant computer:<br>(1) Please include sufficient detail so that an evaluation can be made against the SRP acceptance criteria in SRP Section 7.7.<br>(2) Please identify the equipment (hardware and software) that performs each function described in the FSAR. | | | | | | | |
| **207** | | | EICB (Carte | July 27, 2010<br><br>Deleted by DORL | Date:<br>Responder: | 195. Y | Closed | Closed | | | |
| **208** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 7/27/2010<br><br>By letter dated June 18, 2010 (ML101940236), TVA responded to an NRC request for additional information. Enclosure 1 Item No. 6 of this letter identified, for each PAM variable whether the variable was: (1) implemented identically to Unit 1 and reviewed by the NRC, (2) implemented identically to Unit 1 but modified under 10 CFR 50.59 after it was reviewed by the NRC, and (3) implemented in a manner that is unique to Unit 2. There were sixteen variables modified under 10 CFR 50.59; please describe the changes that were performed under 50.59. | Responder: Clark<br><br>The notes provided with the table include the change to the variable under 10 CFR 50.59. For ease of review, the other note references have been deleted for these variables and only the note dealing with the Unit 1 change has been retained in the Notes column of the table excerpt. The applicable notes are highlighted in the notes list. | 196. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>10/5/10 TVA letter Response 71 provided information.<br><br>. | Closed<br><br>NRC to issue formal RAI to TVA | EICB RAI ML102861885 Item No. 12 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL<br><br>See Item 302 which requests more detailed information on this topic |
| **209** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 7/27/2010<br><br>By letter dated June 18, 2010 (ML101940236), TVA responded to an NRC request for additional information. Enclosure 1 Item No. 6 of this letter identified, for each PAM variable whether the variable was: (1) implemented identically to Unit 1 and reviewed by the NRC, (2) implemented identically to Unit 1 but modified under 10 CFR 50.59 after it was reviewed by the NRC, and (3) implemented in a manner that is unique to Unit 2. There were nine variables that were identified as both Unique to Unit 2 and identical to what was reviewed and approved on Unit 1. Please explain. | Responder: Clark<br><br>The first eight variables in question are primary chemistry parameter. The parameters are the same for both units, but in Unit 1, the sample is obtained via the post accident sampling system, while in Unit 2 the sample is obtained using a grab sample via the normal sample system.<br><br>The last variable was somewhat difficult to characterize. The method of detection and the hardware manufacturer is the same in both units. However, due to obsolescence some of the parts are different than what is installed in Unit 1. The differences are described in Note 21 of the original response. | 197. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>!0 /5/10 TVA letter Response 72 provided information. | Closed<br><br>NRC to issue formal RAI to TVA | EICB RAI ML102861885 Item No. 13 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL |
| **210** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 7/27/2010<br><br>By letter dated June 18, 2010 (ML101940236), TVA responded to an NRC request for additional information. Enclosure 1 Item No. 6 of this letter identified, for each PAM variable whether the variable was: (1) implemented identically to Unit 1 and reviewed by the NRC, (2) implemented identically to Unit 1 but modified under 10 CFR 50.59 after it was reviewed by the NRC, and (3) implemented in a manner that is unique to Unit 2. There were seven variables that were identified as both identical to Unit 1 and changed under 10 CFR 50.59. Please explain. | Responder: Clark<br><br>The design basis for Unit 2 is to match Unit 1 as closely as possible. This includes incorporating changes made to Unit 1 after licensing under 10 CFR 50.59. The changes in question fall into this category and are described in the Notes for each variable in the original submittal. | 198. Y | Closed<br><br>10/5/10 TVA letter Response 73 provided information.<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>NRC to issue formal RAI to TVA | EICB RAI ML102861885 Item No. 14 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL<br><br>See Item 302 which requests more detailed information on this topic |
| **211** | 7.5.1.1<br>7.5.2<br>7.6.1<br>7.7.1<br>7.7.2<br>7.7.4<br>7.9 | | EICB (Carte) | 7/27/2010<br><br>FSA Table 7.1-1 shows: "The extent to which the recommendations of the applicable NRC regulatory guides and IEEE standards are followed for the Class 1E instrumentation and control systems is shown below. The symbol (F) indicates full compliance. Those which are not fully implemented are discussed in the referenced sections of the FSAR and in the footnotes as indicated."<br><br>Please describe how systems that are important to safety, but not | Responder: Clark<br><br>The WBN 2 FSAR Section 7.5 defines the following systems as “important to safety”<br><br>1. Post Accident Monitoring including:<br>a. Common Q Post Accident Monitoring System (Safety-Related)<br>i. Reactor Vessel Level<br>ii. Core Exit Thermocouples<br>iii. Subcooling Margin Monitor | 199. Y | Closed | Closed | EICB RAI ML102980066 Item No. 5 | TVA Letter dated 10/5/10<br><br>Amendment 101 Submitted 10/29/10. | Relates to SE Sections:<br>7.5.5, Plant Computer<br>7.6.10, Loose Part Monitoring<br>7.7.1, Control System Description<br>7.7.2, Safety System Status Monitoring System<br>7.7.4, PZR & SG Overfill<br>7.9, Data Communications |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1E, comply with 10 CFR 50.55a(a)1: "Structures, systems, and components must be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety function to be performed." | b. Eagle 21 indications (Safety-Related)<br>c. Foxboro Spec 200 indications (Safety-Related)<br>d. Neutron Monitoring (Source and Intermediate Range) (Safety-Related)<br>e. Radiation Monitors (Safety-Related)<br>f. Unit 1 and Common shared indications (Safety-Related)<br>g. Foxboro I/A indications (Non-Safety-Related)<br>h. Radiation Monitors (Non-Safety-Related)<br>i. CERPI (Non-Safety-Related)<br>j. Integrated Computer System (Non-Safety-Related)<br>k. Unit 1 and Common shared indications (Non-Safety-Related)<br><br>Post Accident Monitoring Instrumentation Design Criteria, WB-DC-30-7, Rev. 22, Appendix A provides the minimum quality requirements for each Category (1, 2 or 3) of variable. By definition, no Category 1 variable can be non-safety-related. Therefore, non-safety-related variables and the source equipment are limited to category 2 or 3. Since some variables are designated as having more than 1 category, the requirements of the highest category apply. Additional design criteria information for specific systems is contained in:<br><br>g. Foxboro I/A – Site-Specific Engineering Specification WBN Unit 2 NSSS and BOP Controls Upgrade Specification Rev. 1 (Attachment 23)<br>h. CERPI – Rod Control System Description, N3-85-4003, Rev. 12 Section 2.2, Design Requirements<br>i. Radiation Monitors – Design Criteria Document WB-DC-40-24, Radiation Monitoring – (Unit 1 / Unit 2), Rev. 21<br>j. Integrated Computer System – Design Criteria Document WB-DC-30-29 Plant Integrated Computer System (ICS), Rev. 8 (Submitted under TVA to NRC letter dated August __, 2010)<br><br>2. Plant Computer (Integrated Computer System) – See Item j above.<br><br>The WBN 2 FSAR Section 7.6, defines the following non-safety-related systems as “other systems required for safety”<br><br>1. Foxboro I/A – While not specifically described, functions performed by the system are described in this section. The qualify requirements are described above.<br><br>2. Lose Part Monitoring System – Design Criteria Document WB-DC-30-31, Loose Parts Monitoring System, Rev. 4, provides the quality requirements for this system. A description of the distributed control system will be added as FSAR section 7.7.1.11 in FSAR Amendment 101.<br><br>Installation is performed in accordance with the quality requirements of either the Bechtel or TVA work order processes based on the quality classification of the equipment being installed. Vendor testing is performed in accordance with procurement specification requirements which are based on the type and quality classification of the equipment. Preoperational testing is performed in | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | accordance with Chapter 14 of the FSAR. | | | | | | |
| **212** | 7.5.2 | | EICB (Carte) | 7/27/2010<br><br>By letter dated June 18, 2010 (ML101940236) TVA stated (Enclosure 1, Attachment 3, Item No. 3) that the PAMS system design specification and software requirements specification contain information to address the "Design Report on Computer Integrity, Test and Calibration..." The staff has reviewed these documents, and it is not clear how this is the case.<br>(1) Please describe how the information provided demonstrates compliance with IEEE 603-1991 Clauses 5.5, 5.7, 5.10, & 6.5.<br>(2) Please describe how the information provided demonstrates conformance with IEEE 7-4.3.2-2003 Clauses 5.5 & 57. | Responder: WEC<br><br>Application specific requirements for testing. This cannot be addressed in a topical report. Evaluation of how the hardware meets the regulatory requirements.<br><br>WEC to provide the information and determine where the information will be located.<br><br>**IEEE-603 1991:**<br>**5.5 System Integrity.** The safety systems shall be designed to accomplish their safety functions under the full range of applicable conditions enumerated in the design basis.<br><br>**TVA Response:** The applicable conditions and Common Q PAMS system compliance are contained in WNA-LI-00058-WBT-P, Rev. 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, Section 11, "Contract Compliance Matrix" items:<br>• 87 and 88 Seismic<br>• 89, 90, 91, 92 and 185 EMI/RFI<br>• 300, 301 and 302 Environmental<br><br>**5.7 Capability for Test and Calibration.** Capability for testing and calibration of safety system equipment shall be provided while retaining the capability of the safety systems to accomplish their safety functions. The capability for testing and calibration of safety system equipment shall be provided during power operation and shall duplicate, as closely as practicable, performance of the safety function. Testing of Class 1E systems shall be in accordance with the requirements of IEEE Std 338-1987. Exceptions to testing and calibration during power operation are allowed where this capability cannot be provided without adversely affecting the safety or operability of the generating station. In this case:<br>(1) appropriate justification shall be provided (for example, demonstration that no practical design exists),<br>(2) acceptable reliability of equipment operation shall be otherwise demonstrated, and<br>(3) the capability shall be provided while the generating station is shut down.<br><br>**TVA Response:** The requirements for test and calibration and Common Q PAMS system compliance, are contained in WNA-LI-00058-WBT-P, Rev. 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" Section 11, "TVA Contract Compliance Matrix" items:<br>• 202 self test<br>• 350 Maintenance Bypass<br>• 351 Loop Tuning Parameters, | 6. N | Open<br><br>Response included in letter dated 12/22/10. | Open-NRC Review<br><br>Due 12/22/10<br><br>To be addressed by WBN2 specific test plan | EICB RAI ML102980066 Item No. 10 | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | • 400 and 401 3.7.2 Testing, Calibration, and Verification<br>• 402, 403 and 404, 3.7.3 Channel Bypass or Removal from Operation<br><br>**5.10 Repair.** The safety systems shall be designed to facilitate timely recognition, location, replacement, repair, and adjustment of malfunctioning equipment.<br><br>**TVA Response:** The requirements for repair and Common Q PAMS system compliance are contained in WNA-LI-00058-WBT-P, Rev. 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" Section 11, "TVA Contract Compliance Matrix" items:<br>• 179 Mean time to repair<br>• 202 self test<br>• 398 3.7 Maintenance<br>• 399 3.7.1 Troubleshooting<br><br>**6.5 Capability for Testing and Calibration**<br><br>**6.5.1** Means shall be provided for checking, with a high degree of confidence, the operational availability of each sense and command feature input sensor required for a safety function during reactor operation. This may be accomplished in various ways; for example:<br>(1) by perturbing the monitored variable,<br>(2) within the constraints of 6.6, by introducing and varying, as appropriate, a substitute input to the sensor of the same nature as the measured variable, or<br>(3) by cross-checking between channels that bear a known relationship to each other and that have readouts available.<br><br>**6.5.2** One of the following means shall be provided for assuring the operational availability of each sense and command feature required during the post-accident period:<br>(1) Checking the operational availability of sensors by use of the methods described in 6.5.1.<br>(2) Specifying equipment that is stable and retains its calibration during the post-accident time period.<br><br>**TVA Response:** The requirements for sense and command feature testing and Common Q PAMS system compliance are contained in WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" Section 11 "TVA Contract Compliance Matrix" items:<br>• 10, display of sensor diagnostic information<br>• 202 self test<br>• 205 self diagnostics and watchdog timer<br>• 264 through 271, system self checks<br>• 311 system status displays,<br>• 341 alarms, | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | • 344 on-line diagnostics<br><br>**IEEE 7-4.3.2-2003**<br>**5.5 System integrity**<br>In addition to the system integrity criteria provided by IEEE Std 603-1998, the following are necessary to achieve system integrity in digital equipment for use in safety systems:<br>— Design for computer integrity<br>— Design for test and calibration<br>— Fault detection and self-diagnostics<br><br>**5.5.1 Design for computer integrity**<br>The computer shall be designed to perform its safety function when subjected to conditions, external or internal, that have significant potential for defeating the safety function. For example, input and output processing failures, precision or round off problems, improper recovery actions, electrical input voltage and frequency fluctuations, and maximum credible number of coincident signal changes.<br><br>If the system requirements identify a safety system preferred failure mode, failures of the computer shall not preclude the safety system from being placed in that mode. Performance of computer system restart operations shall not result in the safety system being inhibited from performing its function.<br><br>**TVA Response:** Common Q PAMS system reliability and failure modes are described in:<br>• WNA-AR-00180-WBT, Revision 0, "Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System"<br>• WNA-AR-00189-WBT, Revision 0 "Post Accident Monitoring System Reliability Analysis"<br><br>The requirements for mean time between failure and Common Q PAMS system compliance are contained in WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Section 11 "TVA Contract Compliance Matrix" item 178.<br><br>**5.5.2 Design for test and calibration**<br>Test and calibration functions shall not adversely affect the ability of the computer to perform its safety function. Appropriate bypass of one redundant channel is not considered an adverse effect in this context. It shall be verified that the test and calibration functions do not affect computer functions that are not included in a calibration change (e.g., setpoint change).<br><br>V&V, configuration management, and QA shall be required for test and calibration functions on separate computers (e.g., test and calibration computer) that provide the sole verification of test and calibration data. | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | V&V, configuration management, and QA shall be required when the test and calibration function is inherent to the computer that is part of the safety system.<br><br>V&V, configuration management, and QA are not required when the test and calibration function is resident on a separate computer and does not provide the sole verification of test and calibration data for the computer that is part of the safety system.<br><br>**TVA Response:** The requirements for test and calibration and Common Q PAMS system compliance are contained in WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" Section 11 "TVA Contract Compliance Matrix" items:<br>• 202 self test<br>• 350 Maintenance Bypass<br>• 351 Loop Tuning Parameters,<br>• 400 and 401 3.7.2 Testing, Calibration, and Verification<br>• 402, 403 and 404, 3.7.3 Channel Bypass or Removal from Operation<br><br>**5.5.3 Fault detection and self-diagnostics**<br>Computer systems can experience partial failures that can degrade the capabilities of the computer system, but may not be immediately detectable by the system. Self-diagnostics are one means that can be used to assist in detecting these failures. Fault detection and self-diagnostics requirements are addressed in this sub-clause.<br><br>The reliability requirements of the safety system shall be used to establish the need for self-diagnostics. Self diagnostics are not required for systems in which failures can be detected by alternate means in a timely manner. If self-diagnostics are incorporated into the system requirements, these functions shall be subject to the same V&V processes as the safety system functions.<br><br>If reliability requirements warrant self-diagnostics, then computer programs shall incorporate functions to detect and report computer system faults and failures in a timely manner. Conversely, self-diagnostic functions shall not adversely affect the ability of the computer system to perform its safety function, or cause spurious actuations of the safety function. A typical set of self-diagnostic functions includes the following:<br>— Memory functionality and integrity tests (e.g., PROM checksum and RAM tests)<br>— Computer system instruction set (e.g., calculation tests)<br>— Computer peripheral hardware tests (e.g., watchdog timers and keyboards) | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | — Computer architecture support hardware (e.g., address lines and shared memory interfaces)<br>— Communication link diagnostics (e.g., CRC checks)<br><br>Infrequent communication link failures that do not result in a system failure or a lack of system functionality do not require reporting.<br><br>When self-diagnostics are applied, the following self-diagnostic features shall be incorporated into the system design:<br>a) Self-diagnostics during computer system startup<br>b) Periodic self-diagnostics while the computer system is operating<br>c) Self-diagnostic test failure reporting<br><br>**TVA Response:** The requirements for fault detection and self diagnostics and Common Q PAMS system compliance are contained in WNA-LI-00058-WBT-P, Rev. 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" Section 11 "TVA Contract Compliance Matrix" items:<br>• 107 error free download<br>• 202 self test<br>• 205 self diagnostics and watchdog timer<br>• 263 primary and backup communication<br>• 264 through 271, continuous on-line self checks<br>• 311 system status displays,<br>• 341 alarms,<br>• 344 on-line diagnostics<br><br>**5.7 Capability for test and calibration**<br>No requirements beyond IEEE Std 603-1998 are necessary.<br><br>**TVA Response:** No response required.<br><br>Concurrence: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: RAI 212 Response - Errors in the Contract Compliance Matrix, dated December 17, 2010 | | | | | | |
| **213** | 7.5.2 | | EICB (Carte) | 7/27/2010<br><br>By letter dated June 18, 2010 (ML101940236) TVA stated (Enclosure 1, Attachment 3, Item No. 3) that the PAMS system design specification and software requirements specification contain information to address the "Theory of Operation Description." The staff has reviewed these documents, and it is not clear how this is the case. The docketed material does not appear to contain the design basis information that is required to evaluate compliance with the Clause of IEEE 603.<br>(1) Please provide the design basis (as described in IEEE 604 Clause 4) of the Common Q PAMS.<br>(2) Please provide a regulatory evaluation of how the PAMs complies with the applicable regulatory requirements for the theory of operation.<br>For example: Regarding IEEE 603 Clause 5.8.4 (1) What are the manually controlled protective actions? (2) How do the documents | Responder: WEC<br><br>Conformance with IEEE 603 is documented in the revised Common Q PAMS Licensing Technical Report and the Common Q PAMS System Design Specification.<br><br>Attachment 1 contains the proprietary version of Westinghouse document "Tennessee Valley Authority (TVA), Watts Bar Unit 2 (WBN2), Post-Accident Monitoring System (PAMS), Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P, Dated October 2010"<br><br>Attachment 8 contains the proprietary version of Westinghouse document "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System – System Design Specification", WNA-DS-01667-WBT, Rev. 2 dated September 2010. | 14. N | Open<br><br>Response is included in letter dated 10/25/10<br><br>NNC to review and revise this question after LTR R2 is received. | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 2/3/11:** The identified documentation does not include the design bases. Please provide schedule for providing the requested information. | EICB RAI ML102980066 Item No. 18 | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | identified demonstrate compliance with this clause? | | | | | | | |
| **214** | | | EICB (Carte) | 7/27/2010<br><br>By letter dated June 18, 2010 (ML101940236) TVA stated (Enclosure 1, Attachment 3, Item No. 10) that the approved Common Q Topical Report contains information to address the "Safety Analysis." The Common Q SPM however states that a Preliminary Hazards Analysis Report and the V&V reports document the software hazards analysis. Please Provide these documents. | Responder: WEC<br><br>According to "The Software Program Manual for Common Q Systems," WCAP-16096-NP-1A, the Software Safety Plan only applies to Protection class software and PAMS is classified as Important-to-safety. Exhibit 4-1 of the SPM shows that PAMS is classified as Important-to-Safety | 200. Y | Closed | Closed | EICB RAI ML102980066 Item No. 11 | TVA Letter dated 10/5/10 | |
| **215** | | | DORL (Poole) | 7/29/2010<br><br>By letter dated June 18, 2010, TVA provided a table showing the documents that had been completed and were available for staff review. In a conference call on July 27, 2010, TVA agreed to submit the requested documents on the docket. Please provide the schedule for submitting the documents. | Responder: WEC<br><br>Close this item | 201. Y | Closed | Closed | | | |
| **216** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | 7/29/2010<br><br>By letter dated March 12, 2010 (ML101680577), TVA stated that it would provide five documents to describe the Process computer: (1) EDCR 52322 Rev. A excerpts, (2) HP RX2660 Users Guide AB419-9002C-ed6, (3) Dell Poweredge R200 Server sheet November 2007, (4) RTP Corp 8707 I/O Brochure RTP 8707-02, 2004, and (5) Integrated Computer System Drawing. | Responder: Clark<br><br>1) EDCR 52322 is contained in Attachment 7.<br>5) The design change referred to is the addition of a data diode. This has not been incorporated into the drawing. Please see the response to letter item 88 (RAI Matrix Item 224). | 202. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>10/5/10 TVA letter Response 76 and Attachment 7 provided information. | Closed<br><br>**NRC to issue formal RAI to TVA.** | EICB RAI ML102861885 Item No. 15 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL |
| **217** | | | EICB (Garg) | 7/6/2010<br><br>Provide copies excerpts of the EDCRs and DCNs that provide the block and logic diagrams for the Foxboro Spec 200 implementation. | Responder: Clark<br><br>Attachment 7 contains excerpts of the following change documents:<br><br>DCN 52376 Note: These changes are scheduled to be implemented after Unit 2 Fuel Load<br>DCN 52641<br><br>NOTE: DCN 52376 and 52641 impact loops already in service for Unit 1 and as such are implemented under 10CFR50.59.<br><br>EDCR 52343<br>EDCR 52427 | 203. Y | Close | Closed | EICB RAI ML102910008 Item#55 | TVA Letter dated 7/30/10 | |
| **218** | | | EICB (Garg) | 7/6/2010<br><br>Provide copies excerpts of the EDCRs and DCNs that provide the block and logic diagrams for the Foxboro Spec 200 implementation. | Responder: Clark<br><br>The excerpt of work order WO 08-813412-000 provided with the June 18 letter did not contain the information showing that the new type (Arnold) power supplies had been installed in the Unit 1 Eagle 21 system. Please provide the necessary pages of the work order to verify the installation of Arnold power supplies in the Unit 1 Eagle 21 System. | 204. Y | Closed<br><br>Attachment 8 contains the required correct work order excerpt. | Closed | EICB RAI ML102910008 Item#56 | TVA Letter dated 7/30/10 | |
| **219** | | | EICB (Garg) | 8/4/2010<br><br>Transmit copy of February 8, 2008 FSAR Red-Line for Unit 2 letter with attachments [CD]. | Responder: TVA Licensing<br><br>A copy was hand carried by Mr. W. Crouch and delivered to Stewart Bailey at the August 17 meeting at NRC headquarters.<br><br>**TVA Revised Response:** | 205. Y | Closed<br><br>Check what sent by Terry missing attachments. | Closed | EICB RAI ML102910008 Item#57 | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Attachment 6 contains the redline FSAR with attachments. | | | | | | |
| **220** | | | EICB (Garg) | 8/4/2010<br><br>For Safety Related SSPS, submit letter justifying delta between U1 [utilizing ARs] & U2 [utilizing ARs and MDRs]. [Requires TS change ???] | Responder: Ayala<br><br>The Westinghouse ARLA latch attachment is obsolete. In order to provide a latching relay for Unit 2 Solid State Protection System (SSPS), a MDR latching relay must be used. MDR relays are currently in use and shown to be reliable as SSPS Slave Relays in other Westinghouse plants.<br><br>The Technical Specification (TS) Bases was updated in Amendment B to indicate acceptability of testing MDR ESFAS Slave relays on an 18-month interval based on the assessment done in WCAP-13878-P-A, Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays".<br><br>An initial Unit 2 ESFAS SSPS Slave Relay Service Life and Contact Load study similar to that done in Unit 1 has been completed to show that Unit 2 satisfies the conditions of WCAP-13877-P-A, Revision 2, "Reliability Assessment of Westinghouse Type AR Relays used as SSPS Slave Relays", and WCAP-13878, Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays". The Contact Load study also identifies locations in which MDR relays are not acceptable for use. | 206. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>Are there any open issues? Docket plant specific responses to the individual. | Closed<br><br>TVA to respond or provide proposed date of response. | EICB RAI ML102910008 Item#23 | TVA Letter dated 10/5/10 | |
| **221** | 7.7.1.2 | 7.7.1.3 | EICB (Marcus) | 8/4/2010<br><br>Submit EDCR Technical Evaluation for the source and intermediate range updated electronics for Unit 2 | Responder: Trelease<br><br>The EDCR 52421 Source and Intermediate Range, Scope and Intent, Unit Difference and Technical Evaluations are contained in Attachment 31 to 10/5 letter. | 207. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>10/5/10 TVA letter Response 78 and Attachment 31 provided information. | Closed<br><br>**NRC to issue formal RAI to TVA.** | EICB RAI ML102861885 Item No. 16 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL |
| **222** | | | EICB (Garg) | 8/4/2010<br><br>Submit updated list for Foxboro Spec 200 [replacement of Bailey and Robert-Shaw electronics | Responder: Clark<br><br>The updated listing of Foxboro Spec 200 loop functions is contained in Attachment 33. | 208. Y | Close<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102910008 Item#24 | TVA Letter dated 10/5/10 | |
| **223** | | | EICB (Garg) | 8/4/2010<br><br>Submit EDCR Technical Evaluation for Foxboro I/A replacing obsolete non-safety related Foxboro H-Line analog electronics with a digital CDS. [selected single point failures being addressed in design] | Responder: Clark<br><br>Duplicate of item 233. | 209. Y | Closed | Closed | EICB RAI ML102910008 Item#58 | | |
| **224** | 7.5.1.1 | 7.5.2 | EICB (Marcus) | 8/4/2010<br><br>Mike Norman [TVA Computer Eng. Group] will check status of DCN/50.59 for Integrated Computer System upgrade that will install the data diode between the WBN PEDS and the Unit 1 and Unit 2 ICS. | Responder: Norman (TVA CEG)<br><br>The Data diode to isolate the WBN Unit 1 and Unit 2 ICS computers from the WBN PEDS computers will be installed in PIC 56278 as part of DCN 54971. This DCN is scheduled for implementation in Spring 2011. This date was included in the Cyber Security Plan Implementation Schedules submitted to the NRC on July 23. | 210. Y | Closed<br><br>Response provided in letter dated 10/5/10<br><br>10/5/10 TVA letter Response 80 provided information. | **Closed**<br><br>**NRC to issue formal RAI to TVA.** | EICB RAI ML102861885 Item No. 17 | TVA Letter dated 10/5/10 | EICB RAI ML102861885 sent to DORL |
| **225** | | | EICB (Garg) | 8/4/2010<br><br>Provide EDCR Technical Evaluation Justify/explain updated hardware [functionally equivalent to Unit 1] for the RCP and | Responder: Scansen<br><br>The requested information is contained in the Scope and Intent, Unit Difference and Technical Evaluations for EDCRs | 211. Y | Close<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102910008 Item#25 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Turbine Generator vibration monitoring equipment. | 52420 (Attachment 11) and 53559 (Attachment 12) | | | | | | |
| **226** | | | EICB (Carte) | 8/4/2010<br><br>Submit the Foxboro I/A segmentation analysis and ICS Design Criteria documents on an expedited separate letter. Provide a date when the Segmentation analysis will be revised based on discussions at the meeting. | Responder: TVA Licensing<br><br>These documents were submitted under TVA letter dated August 11, 2010. | 212. Y | Closed<br><br>**NNC 8/25/10:** Segmentation analysis has been received and read. Please describe why a failure or error will not propagate over the -peer-to-peer network, and cause more than one segment to fail. | Closed | N/A – Information requested under another open item. | TVA Letter dated 8/11/10 | See also Open Item Nos. 41 & 270. |
| **227** | | | EICB (Garg) | 8/4/2010<br><br>Provide copies of 50.59s for the following Unit 1 changes<br><br>a. CERPI (initial installation and 2009 upgrade)<br>b. Vibration monitoring (RCP, TG and FW pumps to Bentley-Nevada 3300)<br>c. Containment Sump Level Transmitter replacement<br>d. Turbine Servo Control Valve Card replacement<br>e. Pressurizer Heater deletion of Backup Heaters on for PZR High Level<br>f. AMSAC<br>g. Significant ESFAS changes | Responder: Clark<br><br>A. CERPI, initial installation DCN 51072 and 2009 upgrade DCN 52957 (Attachment Upgrade of RCP, TG and FW pumps vibration monitoring to Bentley-Nevada 3300, DCN 39242, DCN 39506, DCN 39548, and DCN 50750 (Attachment )<br>B. Containment Sump Level Transmitter replacement, DCN 39608 (Attachment )<br>C. Turbine Servo Control Valve Card replacement, DCN 38993 (Attachment )<br>D. Pressurizer Heater deletion of Backup Heaters on for PZR High Level, DCN 51102 (Attachment )<br>E. AMSAC DCN 50475 (Attachment )<br>F. Significant ESFAS changes<br>i. Relocate containment isolation valve function and relocate the 6.9KV Shutdown Boards Emergency Feeder Breaker Trip function from K626 and K602, respectively, to minimize disruption on plant operation. DCN 38238 (Attachment )<br>ii. Revise OTΔT and OPΔT turbine runback setpoints, DCN 38842 (Attachment )<br>iii. Install Integrated Computer System (ICS) Stages 4 and 5, DCN 50301 (Attachment ) | 213. Y | Close<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102910008 Item#26 | TVA Letter dated 10/5/10 | |
| **228** | | | EICB (Carte) | 8/4/2010<br><br>Submit rod control system description N3-85-4003 | Responder: Clark<br><br>The Rod Control System Description N3-85-4003 is contained in Attachment 21. | 214. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102980066 Item No. 6 | TVA Letter dated 10/5/10 | |
| **229** | | | EICB (Carte) | 8/4/2010<br><br>Submit Annunciator system description/design criteria | Responder: Clark<br><br>Condition Status/Alarm Design Criteria Document WB-DC-30-21 is contained in Attachment 22. | 215. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102980066 Item No. 7 | TVA Letter dated 10/5/10 | |
| **230** | | | EICB (Carte) | 8/4/2010<br><br>Submit Foxboro I/A Procurement Specification excerpts that provide system description information | Responder: Webb<br><br>The requested Foxboro I/A Procurement Specification is contained in Attachment 23. | 216. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102980066 Item No. 8 | TVA Letter dated 10/5/10 | |
| **231** | | | EICB (Garg) | 8/4/2010<br><br>Update FSAR Amendment 100 Section 7.1.1.2 markup based on discussion with Hukam Garg. | Responder: Clark<br><br>FSAR section 7.1.1.2 is revised in FSAR Amendment 100 submitted to the NRC on TVA letter to the NRC dated September 1, 2010 includes the requested clarifications. | 217. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>FSAR AMD 100 | EICB RAI ML102910008 Item#27 | TVA Letter dated 10/5/10 | |
| **232** | | | EICB (Singh) | 8/4/2010<br><br>Submit EDCR Technical Evaluation for LPMS EDCR | Responder: Clark<br><br>The EDCR 52418 Lose Part Monitoring Scope and Intent, | 218. Y | Closed | Closed<br><br>TVA provided | RAI No. 5 ML102980005 10/26/2010 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Unit Difference and Technical Evaluations are contained in Attachment 24 to 10/5 letter. | | | information in Att. 24 of 10/5 letter. | | | |
| **233** | | | EICB (Carte) | 8/4/2010<br><br>Submit EDCR Technical Evaluation for Foxboro I/A EDCR | Responder: Clark<br><br>Foxboro I/A EDCRs 52378 and 52671 Scope and Intent, Unit Difference and Technical Evaluations are contained in Attachment 25 to the 10/5 letter. | 219. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102980066 Item No. 12 | TVA Letter dated 10/5/10 | |
| **234** | | | EICB (Carte) | 8/4/2010<br><br>Bechtel to perform D3 analysis for Common Q PAMS which will be incorporated into Westinghouse Licensing Technical Report. | Responder:<br><br>Duplicate of Item 64 | 220. Y | Closed | Closed | N/A – Duplicate Item | N/A | |
| **235** | | | EICB (Garg) | 8/4/2010<br><br>TVA to ensure Stewart Bailey is on cc: for all Chapter 7 RAI response letters. | Responder: TVA Licensing<br><br>Stewart Bailey has been added to the standard response letter template used for Chapter 7 responses. | 221. Y | Closed | Closed | N/A | N/A | |
| **236** | | | EICB (Garg) | 8/4/2010<br><br>Submit EDCR Technical Evaluation for Foxboro Spec 200 EDCRs | Responder: Clark<br><br>Foxboro Spec 200 EDCRs 52343, 52427 and 52641, Scope and Intent, Unit Difference and Technical Evaluations are contained in Attachment 26 to 10/5 letter. | 222. Y | Close<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102910008 Item#28 | TVA Letter dated 10/5/10 | |
| **237** | | | EICB (Carte) | 8/4/2010<br><br>Submit EDCR Technical Evaluation for Annunciator EDCR | Responder: Clark<br><br>The Annunciator EDCR 52315 Scope and Intent, Unit Difference and Technical Evaluations are contained in Attachment 27 to 10/5 letter. | 223. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | EICB RAI ML102980066 Item No. 13 | TVA Letter dated 10/5/10 | |
| **238** | | | EICB (Carte) | 8/4/2010<br><br>Discuss with TVA adding a description of the Foxboro I/A system to chapter 7 of the FSAR. | Responder: Webb/Hilmes<br><br>Duplicate of item 201 | 224. Y | Closed | Closed | N/A – Duplicate Item | N/A | |
| **239** | | | EICB (Carte) | 8/4/2010<br><br>Plan a meeting with TVA the NRC and Westinghouse to review Common Q PAMS documentation. | Responder: Hilmes<br><br>meeting held 8/17/10 | 225. Y | Closed | Closed | N/A – Meeting request | N/A | |
| **240** | | | EICB (Garg) | 8/4/2010<br><br>Submit EDCR Technical Evaluation for Vibration Monitoring EDCR(s) | Responder: Clark<br><br>The Scope and Intent, Unit Difference and Technical Evaluations for EDCRs 53559 and 52420 are contained in Attachment 28 of 10/5 letter. | 226. Y | Close<br><br>Response provided in letter dated 10/5/10 | Closed | MI102910008 Item#29 | TVA Letter dated 10/5/10 | |
| **241** | | | EICB (Singh) | 8/4/2010<br><br>Review CERPI WCAPs for system description information to be submitted to the NRC. | Responder: Davies<br><br>CERPI was designed after Westinghouse stopped using WCAPs. The document that provides the most detailed information is the CERPI System Requirements Specification WN-DS-00001-WBT Rev. 2. The proprietary version of this document and the affidavit for withholding are contained in Attachment 29. | 227. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>TVA provided information in Att. 29 of 10/5 letter. | RAI No. 10 ML102980005 10/26/2010 | TVA Letter dated 10/5/10 | |
| **242** | | | EICB (Garg) | 8/4/2010<br><br>TVA to make firm decision on date of transfer (before or after initial | Responder: Hilmes<br><br>The Unit 2 loops in service for Unit that are scheduled to be | 228. Y | Close<br><br>Response provided in letter | Closed | EICB RAI ML102910008 Item#30 | TVA Letter dated 10/5/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | startup) of Unit 2 loops in service for Unit 1 to new Foxboro Spec 200 hardware | transferred to the Foxboro Spec 200 hardware will be transferred prior to Unit 2 fuel load. | | dated 10/5/10 | | | | |
| **243** | | | EICB (Carte) | 8/3/2010<br><br>Section 8.2.1 of the Common Q SPM (ML050350234) states that the System Requirements Specification (SysRS) includes the system design basis. Section 1.2, "System Scope," of the WBN2 PAM SysRS (ML101680578) includes a description of the PAMS design bases that does not meet the requirements of IEEE 603-199 Clause 4. Please provide a description of the PAMs design bases that conforms to the requirements of IEEE 603-1991 Clause 4. | Responder: WEC<br><br>WEC to address at the 9/15 meeting<br><br>Closed to Item 142 | 229. Y | Closed | Closed | N/A – Closed to Item No. 142 | N/A | |
| **244** | | | EICB (Carte) | 8/3/2010<br><br>Section 8.2.2 of the Common Q SPM (ML050350234) states that the Software Requirements Specification (SRS) shall be developed using IEEE 830 and RE 1.172. Clause 4.8, "Embedding project requirements in the SRS," of the IEEE 830 states that an SRS should address the software product, not the process of producing the software. In addition Section 4.3.2.1 of the SPM states "Any alternatives to the SPM processes or additional project specific information for the ...SCMP...shall be specified in the PQP.<br><br>Contrary to these two statements in the SPM, the WBN2 PAMS SRS (ML101050202) contains many process related requirements, for example all seventeen requirements in Section 2.3.2, "Configuration Control," address process requirements for configuration control.<br><br>Please explain how the above meets the intent of the approved SPM. | Responder: WEC<br><br>The process related requirements have been removed from revision 2 of the Software Requirements Specification (SRS).<br><br>Attachment 3 of letter dated 10/25/10 contains the proprietary version of Westinghouse document "Nuclear Automation, Watts Bar 2 NSSS Completion Program, I&C Projects, Software Requirements Specification for the Post Accident Monitoring System", WNA-SD-00239-WBT, Revision 2, Dated September 2010.<br><br>**TVA Response to Follow-up NRC Request:**<br>As shown is the listed documents, process related requirements have been deleted from the SRS and SysRS in Revision 3:<br><br>Attachment 1 contains proprietary version of WNA-DS-01617-WBT-P, Revision 3, "Post Accident Monitoring System-System Requirements Specification," dated December 2010.<br><br>Attachment 7 contains the proprietary version of WNA-SD-00239-WBT-P, Revision 3, "Software Requirements Specification for the Post Accident Monitoring System," dated December 2010.<br><br>Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: Common Q RAI concerns, dated December 8, 2010 (Reference 17)<br><br>**TVA Response to Follow-up NRC Request:**<br><br>See Response to item 3 (Item number 142) | 15. N | Open<br><br>Revised response is included in letter dated 12/22/10<br><br>Response is provided in letter dated 10/25/10.<br><br>**NNC 11/18/10:** SysRS Rev. 2 also contains process requirements that are more appropriately incorporated into process documentation. | Open-TVA/WEC<br><br>**Due 2/25/11** Document revisions<br><br>**NNC 2/2/11:** Issues with Common Q TR & SPM compliance were discussed in the weekly public meetings. Westinghouse to perform Common Q TR & SPM compliance self assessment; this will be discussed in detail on the next audit. | EICB RAI ML102980066 Item No. 14 | Response is provided in letter dated 10/25/10. | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |
| **245** | | | EICB (Carte) | 8/3/2010<br><br>Section 5.8 of the Common Q SPM (ML050350234) identifies the required test documentation for systems developed using the Common Q SPM. Please provide sufficient information for the NRC staff to independently assess whether the test plan for WBN2 PAMS, is as described in the SPM (e.g., Section 5.8.1). | Responder: WEC<br><br>Relates to the commitment to provide the test plan and the SPM compliance matrix<br><br>Attachment 9 contains the Westinghouse document "Post Accident Monitoring System Test Plan," WNA-PT-00138- | 16. N | Open<br><br>Response included in letter dated 12/3/10<br><br>Common Q PAMS Test Summary Report scheduled to | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 2/2/11:** Issues with the Common Q TR & SPM were discussed | EICB RAI ML102980066 Item No. 119 | | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | WBT, Revision 0, dated November 2010. Attachment 10 contains the Westinghouse Application for Withholding for the "Post Accident Monitoring System Test Plan," WNA-PT-00138-WBT, Revision 0, dated November 2010.<br><br>**TVA Revised Response:**<br><br>This is to be addressed in the non-proprietary Common Q PAMS Test Summary Report scheduled to be submitted March 29, 2011. | | be submitted March 29, 2011. | in the weekly public meetings. Westinghouse to perform Common Q TR & SPM compliance self assessment | | | requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |
| **246** | | | EICB (Carte) | 8/3/2010<br><br>Section 4.3.2.1, "Initiation Phase" of the Common Q SPM (ML050350234) requires that a Project Quality Plan (PQP) be developed. Many other section of the SPM identify that this PQP should contain information required by ISG6. Please provide the PQP. If "PQP" is not the name of the documentation produced, please describe the documentation produced and provide the information that the SPM states should be in the PQP. | Responder: WEC<br><br>As agreed ISG6 does not apply to the Common Q PAMS platform. The information required to address this question concerning the PQP and SPM has been added to compliance matrix in revision 1 of the Licensing Technical Report.<br><br>Attachment 1 of letter dated 10/25/10 contains the proprietary version of Westinghouse document "Tennessee Valley Authority (TVA), Watts Bar Unit 2 (WBN2), Post-Accident Monitoring System (PAMS), Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P, Dated October 2010" | 17. N | Open<br><br>Response is provided in letter dated 10/25/10<br><br>**NNC 11/18/10:** PQP has not been provided and CQ PAMS LTR Rev. 1 does not contain comparable information. | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 2/2/11:** Issues with the Common Q TR & SPM were discussed in the weekly public meetings. Westinghouse to perform Common Q TR & SPM compliance self assessment | EICB RAI ML102980066 Item No. 15 | Response is provided in letter dated 10/25/10 | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |
| **247** | | | EICB (Carte) | 8/8/2010<br><br>As part of the Common Q topical report development effort, Westinghouse developed the Software Program Manual for Common Q Systems (ML050350234) to address software planning documentation. The NRC reviewed the SPM and concluded: "the SPM specifies plans that will provide a quality software life cycle process, and that these plans commit to documentation of life cycle activities that will permit the staff or others to evaluate the quality of the design features upon which the safety determination will be based. The staff will review the Implementation of the life cycle process and the software life cycle process design outputs for specific applications on a plant-specific basis." Please identify the implementation documentation produced as a result of following the SPM, and state what information will be docketed. | Responder: WEC<br><br>The implementation documents required by the SPM are identified in the compliance matrix in revision 1 of the Licensing Technical Report.<br><br>Attachment 1 of letter dated 10/25/10 contains the proprietary version of Westinghouse document "Tennessee Valley Authority (TVA), Watts Bar Unit 2 (WBN2), Post-Accident Monitoring System (PAMS), Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P, Dated October 2010" | 230. Y | Closed | Closed | EICB RAI ML102980066 Item No. 16 | Response is provided in letter dated 10/25/10 | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |
| **248** | | | EICB (Carte) | 8/8/2010<br><br>As part of the Common Q topical report development effort, Westinghouse developed the Software Program Manual for Common Q Systems (ML050350234) to address software planning documentation. The NRC reviewed the SPM and concluded: "the SPM specifies plans that will provide a quality software life cycle process, and that these plans commit to documentation of life cycle activities that will permit the staff or others to evaluate the quality of the design features upon which the safety determination will be based. The staff will review the Implementation of the life cycle process and the software life cycle process design outputs for specific applications on a plant-specific basis." Please identify the design outputs produced as a result of following the SPM, and state when what information will be docketed. | Responder: WEC<br><br>The documents are identified in the compliance matrix in revision 1 of the Licensing Technical Report<br><br>Attachment 1 of the letter dated 10/25/10 contains the proprietary version of Westinghouse document "Tennessee Valley Authority (TVA), Watts Bar Unit 2 (WBN2), Post-Accident Monitoring System (PAMS), Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P, Dated October 2010" | 231. Y | Closed | Closed | | Response is provided in letter dated 10/25/10 | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |
| **249** | | | EICB (Carte | 8/8/2010<br><br>The SVVP in the SPM describes the V&V implementation tasks | Responder: WEC<br><br>Close to previous items to provide the V&V Reports. | 232. Y | Closed | Closed | | | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | that are to be carried out. The acceptance criterion for software V&V implementation is that the tasks in the SVVP have been carried out in their entirety. Documentation should exist that shows that the V&V tasks have been successfully accomplished for each life cycle activity group. Please provide information that shows that the V&V tasks have been successfully accomplished for each life cycle activity group. | | | | | | | be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |
| **250** | | | EICB (Carte) | 8/8/2010<br><br>The SPM describes the software and documents that will be created and placed under configuration control. The SCMP (e.g., SPM Section 6, "Software Configuration Management Plan") describes the implementation tasks that are to be carried out. The acceptance criterion for software CM implementation is that the tasks in the SCMP have been carried out in their entirety. Documentation should exist that shows that the configuration management tasks for that activity group have been successfully accomplished. Please provide information that shows that the CM tasks have been successfully accomplished for each life cycle activity group. | Responder: WEC<br><br>Westinghouse develops Software Release Reports/Records and a Configuration Management Release Report. Describe the documents and when they will be produced. Summarize guidance on how to produce these records, focus on project specific requirements in SPM etc.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>The following documentation shows that the configuration management tasks for that activity group have been successfully accomplished.<br><br>1. WNA-LI-00058-WT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1) contains the following changes to address the NRC requests:<br><br>a. Section 2.2.1 Hardware/Software Change Process has been added to describe the process of how changes are evaluated.<br><br>b. Section 2.2.2, "Software" has been expanded to include a table detailing evolutionary software changes that have occurred since the initial submittal and the change evaluation of the life cycle.<br><br>2. WNA-PT-00138-WBT, Revision 0, "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Post Accident Monitoring System Test Plan," (Proprietary), dated November 2010 submitted in TVA Letter to NRC, dated December 3, 2010 (Reference 1). | 7. N | Open<br><br>Revised response included in letter dated 12/22/10<br><br>Response included in letter dated 10/25/10. | Open-NRC Review<br><br>Due 12/22/10<br><br>10/25/10 is a partial response. Still waiting on Software Test Plan and all other testing documentation.<br><br>**NNC 2/2/11:** To be addressed during the next audit. | | | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |
| **251** | | | EICB (Carte) | 8/8/2010<br><br>The SPM describes the software testing and documents that will be created. The SPM also describes the testing tasks that are to be carried out. The acceptance criterion for software test implementation is that the tasks in the SPM have been carried out in their entirety. Please provide information that shows that testing been successfully accomplished. | Responder: WEC<br><br>The software testing performed and documents created are addressed by the SPM Compliance matrix contained in Revision 1 of the Licensing Technical Report.<br><br>Attachment 1 of the letter dated 10/25/10 contains the Proprietary version of Westinghouse's document titled: "Tennessee Valley Authority (TVA), Watts Bar Unit 2 (WBN2), Post-Accident Monitoring System (PAMS), Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P, Dated October 2010" | 18. N | Open<br><br>Revised response included in letter dated 12/22/10<br><br>Partial response is provided in letter dated 10/25/10 | Open-TVA/WEC<br><br>**Due 3/29/11**<br><br>**NNC 2/2/11:** Issues with the Common Q TR & SPM were discussed in the weekly public meetings. Westinghouse to perform Common Q TR & SPM compliance self | | | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **TVA Response to Follow-up NRC Request:**<br><br>Please see the response to RAI item 21 in letter dated 12/22/10, NRC Matrix Item 250. | | | assessment | | | requirements and the protection of public health and safety." |
| **252** | | | EICB (Carte) | 8/8/2010<br><br>The SPM contain requirements for software requirements traceability analysis and associated documentation (see Section 5.4.5.3, "Requirements Traceability Analysis"). Please provide information that demonstrates that requirements traceability analysis has been successfully accomplished. | Responder: WEC<br><br>Explain response to AP1000 audit report.<br>RTM docketed NRC awaiting V&V evaluation of RTM.<br><br>The following responses are based on WBN Unit 2 Common Q PAMS traceability:<br><br>Software requirements traceability analysis is described in the following documents:<br><br>1. WNA-LI-00058-WBT-P, Revision 2, "Post-Accident Monitoring System (PAMS) Licensing Technical Report" submitted in TVA Letter to NRC dated December 3, 2010, (Reference 1) Section 11, "TVA Contract Compliance Matrix"<br><br>2. WNA-VR-00279-WBT, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Post Accident Monitoring System" (available for NRC audit at the Westinghouse Rockville office)<br><br>3. WNA-VR-00280-WBT, "Watts Bar 2 NSSS Completion Program I&C Projects Requirements Traceability Matrix for the Reactor Vessel Level Indication System (RVLIS) Custom PC Elements" (available for NRC audit at the Westinghouse Rockville office) This document addresses the RSEDs used in the WBN Unit 2 Common Q PAMS.<br><br>The V&V evaluation of the RTM is documented in section 2.2.2 of the following documents:<br><br>1. The Independent Verification & Validation (IV&V) report covering the Concept and Definition phases ("Nuclear Automation Watts Bar Unit 2 NSSS Completion Program I&C Projects, IV&V Summary Report for the Post Accident Monitoring System," (Proprietary), WNA-VR-00283-WBT, Revision 1, dated November 2010), submitted in TVA Letter to NRC dated December 3, 2010 (Reference 1).<br><br>2. The Independent Verification &Validation (IV&V) report covering the Design and Implementation phases ("Nuclear Automation Watts Bar Unit 2 NSSS Completion Program I&C Projects, IV&V Summary Report for the Post Accident Monitoring System," (Proprietary), WNA-VR-00283-WBT, Revision 2, dated November 2010), submitted in TVA Letter to NRC dated December 3, 2010 (Reference 1).<br><br>3. The integration phase is covered in Attachment 10, the | 19. N | Open<br><br>Response included in letter dated 12/22/10<br><br>Read ML091560352 | Open-TVA/WEC<br><br>Due 2/25/11 (document submittals)<br><br>**NNC 2/2/11**: Updated RTMs and specifications to be provided.<br><br>Requirements traceability to be addressed during he next audit. | | | LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence."<br><br>LIC-101 Rev. 3 states: "The safety analysis that supports the change requested should include technical information in sufficient detail to enable the NRC staff to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety." |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | proprietary version of "IV&V Summary Report for the Post Accident Monitoring System," WNA-VR-00283-WBT-P, Revision 3, dated December 2010. Attachment 11 contains the non-proprietary version of "IV&V Summary Report for the Post Accident Monitoring System," WNA-VR-00283-WBT-NP, Revision 3, dated December 2010. Attachment 12 contains the "Application For Withholding Proprietary Information From Public Disclosure WNA-VR-00283-WBT-P, Revision 3, "IV &V Summary Report for the Post Accident Monitoring System" (Proprietary)," dated December 2010.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>See Response to item 3 (Matrix Item Number 142) | | | | | | |
| **253** | | | EICB (Carte) | 8/8/2010<br><br>TVA provided information by letter dated July 30, 2010 (ML102160349) - See Enclosure 1 Item No. 8 - that some AC160 module contain FPGAs. For those modules that have not been previously approved, please provide information to address regulatory criteria for FPGAs. | Responder: Clark<br><br>All AC160 modules used for the Common Q PAMS have been previously approved. The original response listed all FPGAs when the request was only for components that had not been previously approved. | 233. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed<br><br>TVA to respond or provide proposed date of response. | | TVA Letter dated 10/5/10 | Related to Open Item no. 83.<br><br>LIC-110 Rev. 1 Section 6.2.2 states: "Design features and administrative programs that are unique to Unit 2 should then be reviewed in accordance with current staff positions"<br><br>LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence." |
| **254** | | | EICB (Carte) | 8/10/2010<br><br>Please make the following available in Westinghouse's Rockville office.<br><br>WNA-PD-00056-WBT, Rev 1 "Watts Bar Unit 2 NSSS Completion I&C Projects"<br>As the indicated source of customer specific requirements for deliverables, as indicated in the project plan, this document may serve as one "end" of a thread audit, and may contain information relevant to evaluating the completeness of later requirements.<br><br>956080, Rev 1. "Cabinet mounted electronics – Inadequate core cool monitor (ICCM-86)"<br>Believe this to be the source of the requirements or at least algorithms and justifications for RIVLIS.<br><br>NABU-DP-00014-GEN, rev 2 "Design Process for Common Q Safety Systems". As it defines the scope of other documents we are reviewing, it may clarify what documents are expected to contain what information. | Responder: WEC<br><br>Documents are available for review in the Westinghouse Rockville office per WEC letter WBT-D-2268, NRC Access to Common Q Documents at the Westinghouse Rockville Office, dated 8/16/10 (Reference 2). | 234. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed | N/A - Request to make documents available for audit. | TVA Letter dated 10/21/10 Enclosure 1 Item No. 5 | |
| **255** | | | EICB (Carte) | 8/10/2010<br><br>Please make the following available in Westinghouse's Rockville office.<br>The Reusable Software Elements Documents. These contain requirements for the software.<br>WNA-DS-01564-GEN, Rev 1. ; WNA-DS-00315-GEN, Rev. 2 ; WNA-DS-01715-GEN, Rev 2 ; WNA-DS-01838-GEN, Rev. 3 ; | Responder: WEC<br><br>Documents are available for review in the Westinghouse Rockville office per WEC letter WBT-D-2268, NRC Access to Common Q Documents at the Westinghouse Rockville Office, dated 8/16/10 (Reference 2). | 235. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed | N/A - Request to make documents available for audit. | TVA Letter dated 10/21/10 Enclosure 1 Item No. 6 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WNA-DS-01839-GEN, Rev. 3 ; WNA-DS-01840-GEN, Rev 2. ; WNA-DS-01841, Rev 2. ; WNA-DS-01842-GEN Rev 2.; WNA-DS-01845-GEN Rev. 1. ; WNA-DS-01846-GEN Rev. 2 ; WNA-DS-01847-GEN Rev. 0 ; WNA-DS-01848 Rev. 1. ; WNA-DS-01849-GEN Rev. 2. ; WNA-DS-01994-GEN Rev. 0 ; WNA-DS-00306-GEN Rev. 5 ; WNA-DS-02065-GEN Rev. 2 ; WNA-DS-01505-GEN Rev. 0<br>Further documentation for application-specific type circuits and custom PC elements are indicated by the SRS to be in 00000-ICE-3238, Rev 5 ; 00000-ICE-30140, rev 4 and 00000-ICE-30152, Rev. 5 | | | | | | | |
| **256** | | | EICB (Carte) | 8/10/2010<br><br>Please make the following available in Westinghouse's Rockville office.<br><br>The following are documents that contain requirements used in the SRS which we incorporated by reference within that document.<br>"Coding Standards and Guidelines for Common Q Systems," 00000-ICE-3889, Rev. 10, Westinghouse Electric Company LLC.<br><br>"Application Restrictions for Generic Common Q Qualification," WNA-DS-01070-GEN, Rev. 3, Westinghouse Electric Company LLC.<br><br>"System Requirements Specification for the Common Q Generic Flat Panel Display" 00000-ICE-30155, Rev. 9, Westinghouse Electric Company LLC.<br><br>"Software Requirements Specification for the Common Q Generic Flat Panel Display Software," 00000-ICE-3239, Rev. 12, Westinghouse Electric Company LLC.<br><br>"Common Q Software Configuration Management Guidelines," NABU-DP-00015-GEN, Rev. 2, Westinghouse Electric Company LLC,<br><br>"Standard General Requirements for Cyber security," WNA-DS-01150-GEN, Rev. 0, Westinghouse Electric Company LLC, | Responder: WEC<br><br>Documents are available for review in the Westinghouse Rockville office per WEC letter WBT-D-2268, NRC Access to Common Q Documents at the Westinghouse Rockville Office, dated 8/16/10 (Reference 2). | 236. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed | N/A - Request to make documents available for audit. | TVA Letter dated 10/21/10 Enclosure 1 Item No. 7 | |
| **257** | | | EICB (Carte) | 8/10/2010<br><br>Please make the following available in Westinghouse's Rockville office.<br><br>The following are documents that contain requirements used in the SRS which we incorporated by reference within that document.<br><br>"AC160 CPU Loading Restrictions," AN03007Sp, ABB Memo, ABB Process Automation Corporation,<br><br>"Software Design Description for the Common Q Generic Flat-Panel Display Software," 00000-ICE-30157, Rev. 16, Westinghouse Electric Company LLC.<br><br>"System Requirements Specification for the Common Q Post Accident Monitoring System," 0000-ICE-30156, Rev. 06, Westinghouse Electric Company LLC. | Responder: WEC<br><br>WEC Reviewing to ensure all documents are available in Rockville office.<br><br>WBT-D-2268, 8/16/2010<br><br>WEC still needs to make/confirm this document is available.<br><br>WBT-D-2024, 6/9/2010 | 237. Y | Closed | Closed | N/A - Request to make documents available for audit. | N/A | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | "Software Requirements Specification for the Common Q Post Accident Monitoring System" 00000-ICE-3238, Rev. 5, Westinghouse Electric Company LLC.<br><br>"Commercial Dedication Report for QNX 4.25G for Common Q Applications," WNA-CD-00018-GEN, Rev. 3, Westinghouse Electric Company LLC,<br><br>"Generic Common Q Software Installation Procedure," WNA-IP-00152-GEN, Rev. 7, Westinghouse Electric Company LLC. | WBT-D-2024, 6/9/2010<br><br>WBT-D-2268, 8/16/2010<br><br>WBT-D-2268, 8/16/2010 | | | | | | |
| **258** | | | EICB (Carte) | 8/10/2010<br><br>Please make the following available in Westinghouse's Rockville office.<br><br>The "IV&V Phase Summary Report", (WNA-VR-00283-WBT Rev . 0 ) indicated that the IV&V team had created some information that may facilitate the approval process. However the form the information may have taken was not indicated or referenced in the Phase Summary Report. Information requested for the Rockville office includes:<br>-The excel spreadsheet described in section 2.2.2 that verifies all low level requirements have a basis in a higher one, and that all higher level requirements decompose into a lower level.<br>-A review of the WBU2 SysRS, SDS, and SRS for clarity, completeness, correctness and compatibility<br>-Comparison of the WBU2 SysRS, SDS, and SRS to "source level" documents<br>-An evaluation, per section 2.2.3, of the baseline report<br>-a second party peer review for the "source level" documents | Responder: WEC<br><br>WEC Reviewing to ensure all documents are available in Rockville office. | 238. Y | Closed | Closed | N/A - Request to make documents available for audit. | N/A | |
| **259** | | | EICB (Carte) | 8/10/2010<br><br>Please make the following available in Westinghouse's Rockville office.<br><br>As they may demonstrate that a number of issues raised by, or that will be raised by, the NRC staff are already being resolved by the vendor, we would like to have access to<br>V&V-769 and V&V-770 in the Exception Reports (ER) database for common Q systems. | Responder: WEC<br><br>Documents are available for review in the Westinghouse Rockville office per WEC letter WBT-D-2268, NRC Access to Common Q Documents at the Westinghouse Rockville Office, dated 8/16/10 (Reference 2). | 239. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed | N/A - Request to make documents available for audit. | TVA Letter dated 10/21/10 Enclosure 1 Item No. 8 | |
| **260** | | | EICB (Carte) | 8/10/2010<br><br>Please make the following available in Westinghouse's Rockville office.<br><br>The "Source level" documents for the requirements<br>WBT-TVA-0070 "Safety Related Digital Logic Cards Circuitry and Related Instrument Racks Restrictions"<br><br>WBT-D-0088 "Transmittal Westinghouse comments on TVA specification EDSR 52451"<br><br>Contract Number 65717 Tennessee Valley Authority Watts Bar Nuclear Plant Unit 2 NSSS Completion Project"<br><br>WEST-WBT-2008-25 "TVA Contract Word Authorization" | Responder: WEC<br><br>WEC Reviewing to ensure all documents are available in Rockville office.<br><br>WBT-D-2268, 8/16/2010<br><br>WBT-D-2268, 8/16/2010<br><br>WBT-D-2268, 8/16/2010<br><br>Hilmes to determine if this document can be provided. | 240. Y | Closed | Closed | N/A - Request to make documents available for audit. | N/A | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **261** | | | EICB (Carte) | 8/10/2010<br><br>Please provide the Requirements Traceability Matrix for generic PAMS and/or any other RTMs applicable to WBN2 PAMS. Some requirements in the Software Requirements Specification are simply not present in the Watts Bar 2 PAMS specific RTM (WNA-VR-00279-WBT). | Responder: WEC<br><br>WEC to make available in Rockville ASAP. May require later submittal per 9/15 meeting.<br><br>Closed to Item 142 | 241. Y | Closed | Closed | N/A – Closed to Item No. 142 | TVA Letter dated 8/20/10<br><br>TVA Letter dated 9/2/10 | LIC-110 Rev. 1 Section 6.2.2 states: "Design features and administrative programs that are unique to Unit 2 should then be reviewed in accordance with current staff positions"<br><br>LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence." |
| **262** | | | EICB (Carte) | 8/10/2010<br><br>In order to facilitate visits to the Rockville office, please make the following documents available at the Rockville office.<br><br>Watts Bar 2 PAMS licensing technical report 00000-ICE-37722 Rev. 0 (ML003733136)<br>Common Q Software Programming manual (ML050350234)<br>Common Q topical report. (ML031830959) | Responder: WEC<br><br>WEC Reviewing to ensure all documents are available in Rockville office.<br><br>WBT-D-1526, 01/28/10; WBT-D-2268, 8/16/10 | 242. Y | Closed | Closed | N/A - Request to make documents available for audit. | N/A | |
| **263** | | | EICB (Carte) | 8/11/2010<br>Based on an examination of document available at the Westinghouse Rockville offices (i.e., NA 7.4, WEC 7.2, WEC 7.3, CDI-3803, & CDI-3722) a CDI appears to identify the verification activities for each critical characteristic. These activities appear to be documented on the associated dedication data sheets; therefore, it appears that the Westinghouse Commercial Grade Dedication Plan is called a CDI and the completed CDI data sheets are the commercial grade dedication Report. If so, please provide the CDI for each new (not previously approved) component and the associated completed dedication data sheets. | Responder: WEC<br><br>Addressed in 9/20 - 9/21 audit.<br><br>Combine with item 138 after audit. | 243. Y | Closed | Closed | ML101650255, Item No. 2 | | |
| **264** | | | EICB (Carte) | 8/11/2010<br><br>Please provide a copy of the commercial grade survey(s) applicable to each new (not previously approved) Common Q component. | Responder: WEC<br><br>After the 9/20 - 9/21 audit.<br><br>Combine with item 138 after audit. | 244. Y | Closed | Closed | ML101650255, Item No. 2 | | |
| **265** | | | EICB (Carte) | 8/11/2010<br><br>Please provide:<br>WNA-CD-00018-GEN Rev. 3<br>00000-ICE-35444 Rev. 1 | Responder: WEC<br><br>After the 9/20 - 9/21 audit.<br><br>Combine with item 138 after audit. | 245. Y | Closed | Closed | ML101650255, Item No. 2 | | |
| **266** | | | EICB (Carte) | 8/11/2010<br><br>Please provide a high level description of the Foxboro IA equipment used at WBN2. This description should be more detailed than a brochure on the product line (or available on the web), and less detailed than a technical manual on each field replaceable unit. It is expected that such literature already exists. | Responder: Webb/Webber<br><br>FSAR section 7.7.1.11 will be added in Amendment 101. In discussions with the NRC reviewer on October 4, 2010 it was agreed that the new FSAR section along with previously submitted documents should be sufficient to address this request. The NRC reviewer will notify TVA if additional documentation is required. | 246. Y | Closed | Closed | | TVA Letter dated 10/21/10 Enclosure 1 Item No. 9 | |
| **267** | | | EICB (Carte) | 8/11/2010<br><br>By letter dated June 18, 2010 (ML101940236) TVA stated that the software safety plan (SSP) was not applicable to PAMS applications (see Watts Bar 2 - Common Q PAMS ISG-6 Compliance matrix Item No. 10); however, reference No. 30 of the SRS (ML101050202) is: 00000-ICE-37727, Rev. 0, "Post Accident | Responder: WEC<br><br>This is addressed in the Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P.<br><br>Attachment 1 of the letter dated 10/25/10 contains the Proprietary version of Westinghouse's | 247. Y | Closed | Closed | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Monitoring System Software Preliminary Hazard Analysis for the Common Q PAMS Project." A Preliminary Hazard Analysis is required by the SSP. Please explain. | document titled: "Tennessee Valley Authority (TVA), Watts Bar Unit 2 (WBN2), Post-Accident Monitoring System (PAMS), Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P, Dated October 2010" | | | | | | |
| **268** | | | EICB (Carte) | 8/19/2010<br><br>By letter dated March 12, 2010 (ML101680577), TVA stated that the application specific hardware and software architecture descriptions are addressed in the WBN2 PAMS System Design Specification (ML101680579, ML102040481, & ML102040482) and Software Requirements Specification (ML101050202, ML102040486, & ML1022040487).<br><br>Neither of these documents contain a non-proprietary figure of the architecture that can be used in the SE. Please provide a non-proprietary figure of the architecture. | Responder: WEC<br><br>11/18/10 Warren Odess-Gillett took action to discuss with Design Engineering to generate a non-prop figure<br><br>Attachment 18 contains the non-proprietary version of the Westinghouse document "Watts Bar 2 Common Q PAMS Block Diagram." | 248. N | Closed<br><br>Response included in letter dated 12/3/10 | Closed | | | |
| **269** | | | DORL (Poole) | 8/20/2010<br><br>DORL to send the Eagle-21 Audit Report to TVA. | Responder: NRC | 249. Y | Closed | Closed<br><br>Audit Report sent to TVA. Letter dated 11/2/2010 (ML102240630) | N/A | N/A | |
| **270** | | | EICB (Carte) | 8/23/2010<br><br>By letter dated June 18, 2009 (ML091560352) the NRC informed Westinghouse that WNA-PT-00058-GEN (see pdf page 7 of 25) did not adequately address the test plan criteria of the Software Program Manual (ML050350234); however, by letter dated June 18, 2010 (ML101940236) TVA/Westinghouse stated that WNA-PT-00058-GEN addressed the test plan criteria of the SPM (pdf page 59 of 194, Item No. 12). Please explain. | Responder: Clark<br><br>Close to items 41 and 245 | 250. Y | Closed | Closed | | | See also Open Item Nod. 41 & 245. |
| **271** | | | EICB (Carte) | 8/23/2010<br><br>By letter dated August 20, 2010 TVA docketed a Requirements Traceability Matrix for the Common Q PAMS (Requirements Phase).This document does not identify the source of each requirement. The Common Q PAMS System Requirements Specification (SysRS -ML101680578, ML102040483, & ML102040484) does not explicitly identify the origin of each requirement. The SRP acceptance criteria for requirements specifications is that the origin of the requirements is know. Please explain how to trace each requirement in the SysRS to its origin. | Responder: WEC<br><br>9/15 meeting and 9/20 audit<br><br>Closed to Item 142 | 251. Y | Closed | Closed | N/A – Closed to Item No. 142 | NA | |
| **272** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 8/26/2010<br><br>In WBN2 FSAR Table 7.5-2, "Regulatory Guide 1.97 Variable List (Deviation and Justification for Deviations)," (WBNP-96) for Variable 19, "Containment Hydrogen Concentration," Deviation 2 (page 19 of 41), the variable number is listed as 15. The variable number should be listed as 19. | Responder: Clark<br><br>The variable number will be changed to 19 in FSAR Amendment 101 as shown below:<br><br>Table 7.5-2<br><br>**DEVIATION 2**<br><br>**VARIABLE (~~15~~19)**<br><br>Containment Hydrogen Concentration | 252. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>NRC to issue formal RAI to TVA.<br><br>TVA formal response due 10/31/10 | EICB RAI ML102861885 Item No. 19 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 10 | EICB RAI ML102861885 sent to DORL |
| **273** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 8/26/2010 | Responder: Clark | 253. Y | Closed | Closed | EICB RAI | TVA Letter dated | EICB RAI ML102861885 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In WBN2 FSAR Table 7.5-2, "Regulatory Guide 1.97 Variable List (Deviation and Justification for Deviations)," (WBNP-96) for Variable 97g, "Reactor Coolant Sample Activity," Deviation 5 (page 21 of 41), the last two sentences of the Justification read, "TVA meets the intent of RG 1.97 recommended range by monitoring this variable using the gross activity analysis of primary coolant samples taken in the post accident sampling facility. Samples are obtained from the post accident sampling system in Unit 1 only." Please describe how the samples are obtained for Unit 2. | Post accident samples will be obtained from the normal sample system. | | Response provided in letter dated 10/5/10<br><br>10/5/10 TVA letter Response 95 provided information. | NRC to issue formal RAI to TVA | ML102861885 Item No. 18 | 10/5/10 | |
| **274.a** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 8/26/2010<br><br>In WBN2 FSAR Table 7.5-2, "Regulatory Guide 1.97 Variable List (Deviation and Justification for Deviations)," (WBNP-96) for Variable 82, "Steam Generator Level Wide Range," Deviation 10 (page 24 of 41), in the last sentence, of the Justification, SC should be SG. | Responder: Clark<br><br>The SC in the last sentence will be changed to SG in FSAR Amendment 101 as shown below:<br><br>SG wide range level indication is utilized as a diverse variable to auxiliary feedwater (AFW) flow for gross indication of flow to the SGs. The WBN AFW monitors are Types A1 and D2. WBN's position is that since ~~SC~~ SG wide range level is only used as a backup to redundant AFW flow monitors, it does not require redundancy | 254. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>NRC to issue formal RAI to TVA.<br><br>TVA formal response due 10/31/10 | EICB RAI ML102861885 Item No. 21 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 11 | EICB RAI ML102861885 sent to DORL |
| **274.b** | | | EICB (Singh) | 8/26/2010<br><br>Loose Parts Monitoring System: TR 3.3 refers to section 4.4.6 of the FSAR for description of the loose parts monitoring system. However, this section of the FSAR is not available. TVA to check the reference and respond. | Responder: Stockton<br><br>The reference will be changed to FSAR section 7.6.7 Loose Part Monitoring System (LPMS) System Description in next revision of the Technical Requirements Manual as shown below:<br><br>1. Watts Bar FSAR, Section 7.6.7, "Lose Part Monitoring System." | 255. Y | Closed<br><br>Response provided in letter dated 10/21/10<br><br>TRM Change Package submitted to TVA Licensing. | Closed<br><br>Due _____<br><br>Pending TRM amendment submittal.<br><br>Response acceptable. TVA to complete stated action. | RAI No. 6 ML102980005 10/26/2010 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 12 | |
| **275** | | | EICB (Singh) | 8/27/2010<br><br>Loose Parts Monitoring System: RG 1.133, sections C.1.a and C.1.c address sensor locations and channel separation respectively. TR 3.3, FSAR section 7.6.7 and the DMIMMS-DX System Description do not clearly explain the location or address channel separation per the guidance of RG 1.133. Please update the documents as needed. | Responder: Clark | 256. Y | Closed | Closed | Not Required Answer exists in TRM | N/A | |
| **276** | 7.6 | 7.6 | EICB (Garg) | 8/27/2010<br><br>In order for the staff to review the effects of multi control systems failure, provide the summary of the analyses documenting the effect on the plant based on the following events: (1) loss of power to all control systems powered by a single power supply; (2) failure of each instrument sensor which provides signal to two or more control systems; (3) Break of any sensor impulse line which is used for sensors providing signals to two or more control systems; and (4) failure of digital system based on the common cause software failure affecting two or more control systems. For each of these events, confirm that the consequences of these events will not be outside chapter 15 analyses or beyond the capability of operators or safety systems. | Responder: Webb<br><br>The NRC reviewer confirmed this question applies to non-safety systems.<br><br>The Distributed Control System (DCS) implemented using Foxboro I/A hardware, replaces most of the non-safety related control systems for WBN Unit 2. The other non-safety-related control systems within the scope of this question are:<br><br>a. Rod Control - Failures of this system are addressed in FSAR Chapter 15.<br>b. Main Turbine Electro-Hydraulic Control System<br><br>The following provides the requested summaries for the four events listed: | 257. Y | Closed<br><br>Revised response provided in letter dated 12/22/10<br><br>Response provided in letter dated 10/21/10<br><br>Revised response provided in letter dated 11/24/10<br><br>Response Acceptable. 11/17/10<br><br>TVA changed the response in the latest writeup. The scope of the question applies to all non safety related control systems | Closed<br><br>Due 11/24/10<br><br>TVA to provide justification for non-safety system other than DCS.<br><br>The statement that failure of sense line where more than one transmitter is connected would be bounded by the failure of a single transmitter does not make sense. | EICB RAI ML102910008 Item#60 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 13 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (1) The (DCS) segmentation analysis submitted on TVA letter to NRC dated August 11, 2010, Enclosure 2 (Reference 7) demonstrates that the loss of any single power source does not result in a loss of any DCS function. The other systems within the scope of this question are configured in the same manner as Unit 1, with redundant power sources such that the failure of a single power source does not cause a loss of function.<br><br>(2) Signals shared by more than one control function within the DCS are addressed in the DCS segmentation analysis submitted on TVA letter to NRC dated August 11, 2010, Enclosure 2 (Reference 7) which demonstrates that the loss of a single signal does not cause a failure of any critical control function. The impact of a loss of signal to the other systems within the scope of this question is bounded by the loss of that signal to the individual system and has the same effect as for Unit 1.<br><br>(3) Where feasible, the Unit 2 design includes separate sense lines for redundant transmitters, thereby eliminating multiple single point failures which are present in Unit 1. A review of the transmitter sense line database was performed to identify multiple sensors on a single sense line that had control functions (transmitters and switches). Attachment 9 provides the results of the review and an analysis of the functions impacted by a sense line failure.<br><br>There are no transmitters on shared sense lines, such that a sense line failure would impact any combination of the DCS, Rod Control or Main Turbine Electro-Hydraulic Control Systems.<br><br>(4) Limiting DCS failures were addressed in the segmentation analysis, supplemented by Fault Handling in the I/A Series System, Revision 1, submitted on TVA letter to NRC dated October 5, 2010, Attachment 42 (Reference 1). The other systems within the scope of this question are analog and therefore this question is not applicable.<br><br>All non-safety control systems have been evaluated against these criteria and TVA has determined that their failure does not have consequences which will put the plant outside chapter 15 analyses.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>All non-safety related control systems were reviewed in the context of this question. The review found that failures of non-safety related control systems based on the scenarios in this RAI, do not have consequences which will put the plant outside the Chapter 15 analyses. | | and is not limited to just three system listed by the TVA. TVA could use to envelope other control systems by Unit 1 analysis if they applies to Unit 2 systems also. | TVA needs to make a statement that all non-safety control systems have been evaluated against these criteria and have determined that their failure does not have consequences which will put the plant outside chapter 15 analyses. | | | |
| **277** | 7.6 | 7.6.3 | CB (Gar | 8/27/2010 | Responder: Clark | 258. Y | Close | Closed | EICB RAI ML102910008 | TVA Letter dated 10/29/10 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | NUREG 0847, "Safety evaluation report Related to the operation of Watts Bar Nuclear Plant, Units 1 and 2." has section 7.6.3 which discusses the, "Upper Head Injection Manual Control" system but has been removed from the FSAR. Please provide the information regarding when this system was removed, and the justification for the removal of the system and if the NRC staff has previously reviewed and accepted the removal of the system provide the reference to the staff's SE. | Removal of the Upper Head Injection System was reviewed as part of the WBN Unit 1 original and was reviewed by the staff in SER Supplement 6:<br><br>**1.7 Summary of Outstanding Issues - PAGE 1-3 "Supplement 7"**<br><br>(22) Removal of upper head injection system Opened (SSER 7) 6.3.1 (TAC 77195)<br><br>When the removal of UHI System was evaluated by the NRC, this should be applied to both sections 6.3.1 and 7.6.3, since the UHI Control System has no function once the UHI System has been removed. | | Response is included in letter dated 10/29/10 | | Item#61 | Enclosure 1 Item No. 15 | |
| **278** | 7.6 | 7.6.6 | EICB (Garg) | 8/27/2010<br><br>For FSAR Section 7.6.6, provide the justification for adding valves FCV 63-8 and FCV 63-11, which require that power to be removed and will be administratively controlled prior to use of RHR system for plant cooldown. Provide the P & ID and block diagram showing the operation of these valves. | Responder: Trelease<br><br>UFSAR section 7.6.6 does not identify control valves FCV-63-8 and -11 as part of a list of valves that are required to have their motive power removed during specific operating modes. The Unit 1 General operating instructions GO-1 and GO-6 (which will be used as a guideline for unit 2) provide administrative instructions to remove power and restore power to these valves in mode 3. Also, U1 Emergency operating procedures (e.g ES-1.3) do not address the restoration of power to the valves as part of post LOCA Mitigation activities.<br><br>Attachment 8 contains the control and logic diagrams, along with the applicable design changes to verify that the control schemes are similar to unit 1. | 259. Y | Close<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>TVA to Docket in 10/20 letter | EICB RAI ML102910008 Item#62 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 14 | |
| **279** | 7.6 | 7.6.6 | EICB (Garg) | 8/27/2010<br><br>For FSAR Section 7.6.6, provide the justification for the exception to install protective covers which operator has to remove before he can have access to control switch to operate two additional valves FCV62-98 and FCV62-99. | Responder: Mather<br><br>The FSAR change to include the valves as exceptions to the use of protective covers was made to match Unit 1 UFSAR change Pkg. No. 1547 Safety Assessment Item 8. The change package identified FCV-62-98 and 99 as exceptions to the use of protective covers. This change was based on WBPER980417 which removed the power from the valves and had them locked open. TVA will incorporate the same changes in Unit 2 as Unit 1. The Unit 1 changes are described in References 3 and 4. | 260. Y | Close<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>TVA to docket in 10/20 letter | EICB RAI ML102910008 Item#63 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 15 | |
| **280** | 7.6 | 7.6.6 | EICB (Garg) | 8/27/2010<br><br>For FSAR Section 7.6.6, provide the justification for the acceptability of removing FCV 63-5 from the list of valves which has operating instructions specifying the removal of power during specific modes of plant operation. | Responder: Trelease<br><br>Historical DCN 38661 removes the requirement that power be removed from FCV-63-5 during normal operations, and notes that the valve does not have a shunt breaker to allow MCR position indication with power removed. The Unit 2 system description has been updated to reflect the Unit 1 change to the system description, and the update of section 7.6.6 to remove the requirement of FCV-63-5 from the list of valves which has operating instructions specifying the removal of power during normal operations. This is supported by the failure modes and effects analysis for the safety injection system calculation EMP-SNM-043029 (which has been revised to be applicable to Unit 2), as well as the Unit 2 FSAR Table 6.3-8 both which state that spurious closure of FCV-63-5 is not credible. Spurious closure of | 261. Y | Closed<br><br>Response is acceptable.<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>TVA to issue by 10/20 | EICB RAI ML102910008 Item#64 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 16 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FCV-63-5 is not credible because the MCR hand switch is provided with a protective cover to prevent operator error. In addition, the hand switch is wired with contacts on both sides of the motor contactor to prevent a single failure within the switch gear from spuriously closing the valve. These features eliminate the need to remove power from FCV-63-5.<br><br>Attachment 10 contains the documentation associated with this response. | | | | | | |
| **281** | 7.6 | 7.6.8 | EICB (Garg) | 8/27/2010<br><br>For FSAR Section 7.6.8 in amendment 96, redline version has completely rewritten this section of the FSAR, however, the staff is not able to determine any changes made to the section. Explain what changes have been made to this FSAR Section. | Responder: Webb<br><br>Attachment 5 contains the WBN Unit 2 FSAR markup for Section 7.6.8, "Interlocks for RCS Pressure Control During Low Temperature Operation," showing what was changed between Amendments 95 and 96.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>The interlock for the RCS Pressure Control for Unit 2 is implemented differently than Unit 1 implementation. There are no differences between Unit 1 and Unit 2 interlocks, operation of interlocks and operator interface for operation of the RCS Pressure Control. Primary sensing elements and final control elements are identical and operations of these devices are identical. For Unit 2, once signals are processed by the Eagle 21 system, interlock implementation is by software modules in the Foxboro I/A Distributed Control System (DCS). Hardware outputs, generated in the DCS, operate the PORVs. The Unit 2 DCS is implemented via EDCRs 52378 and 54504. Section 7.6.8 in Amendment 101 of the WBN Unit 2 FSAR reflects the Unit 2 changes associated with implementation of the DCS.<br><br>**TVA Response to Second Follow-up NRC Request:**<br><br>The underlined text from FSAR Amendment 101 Section 7.6.8 reflects the installation of the Foxboro DCS.<br><br>7.6.8 Text from FSAR Amendment 101<br><br>The wide range temperature signals, as inputs to the Protection Sets I and II, continuously monitor RCS temperature conditions. In Protection Set I, the existing RCS wide range temperature channels on RCS loops 1 and 2 provide inputs to the Eagle 21 digital process protection system. Eagle 21 provides isolated analog signals to the digital process control system. An auctioneer function selects the lowest temperature signal which is then used to calculate an acceptable reference pressure limit (PORV setpoint) considering the plant's allowable pressure and temperature Protection Set III. The calculated reference pressure is compared to the actual RCS pressure monitored by the wide range pressure channel. The auctioneered temperature signal will annunciate a main control room (MCR) alarm whenever the measured temperature approaches, within a predetermined amount, the reference temperature for arming the system. Similarly, whenever the measured pressure approaches within a predetermined amount of the | 1. Y | Open<br><br>Response provided in letter dated 10/29/10<br><br>FSAR Amendment 101 did not reflect the changes in 7.6.8 associated with implementation of the DCS. Provide the basis for acceptance to use Foxboro I/A DCS inplace of analog instrumentation and relays.<br><br>Additional clarification provided during 1/20 telecom. Question is how does the system conform to IEEE 279 as described in 7.6.8.1. | Open-TVA/Bechtel<br><br>Due 11/24/10<br><br>Provide the basis for the changes. Look at Foxboro I/A impact. | EICB RAI ML102910008 Item#65 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 16 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | programmed setpoint, another MCR alarm will be generated. When the measured RCS pressure is equal to or above the programmed setpoint (nominal values), a PORV open signal is initiated and a MCR alarm is actuated. A manually armed permissive allows this actuation signal to control the Train A PORV (PCV-68-340A). The manually armed permissive also serves to block a spurious PORV opening due to potential instrument failure whenever the RCS temperature is above the arming reference temperature.<br><br>The monitored generating station variables that generate the actuation signal for the Train B PORV (PCV-68-334) are processed in a similar manner. The RCS loops 3 and 4 wide range temperature signals and the RCS pressure signal are provided from Protection Set II. Therefore, the generating station variables used for the Train B PORV are derived from a protection set that is independent of the sets from which generating station variables used for the Train A PORV are derived. The wide range temperature auctioneer function and the programmed pressure setpoint calculation for the Train B PORV are performed in a different group of the digital process control system than those for the Train A PORV. Each of these control groups has a fault tolerant, redundant processor pair and redundant power supplies with different power sources.<br><br>FSAR Section **7.6.8.1 Analysis of Interlock** describes the system conformance to IEEE-279. The design of the COMS as implemented in the Foxboro I/A system fully complies with FSAR section 7.6.8.1. Items (1) and (2) are implemented as part of the Eagle 21 modification. Item (3) is addressed by each processor pair having redundant power supplies with both being battery backed and ultimately backed by an ESF diesel generator. | | | | | | |
| **282** | 7.6 | 7.6.9 | EICB (Garg) | 8/27/2010<br><br>For FSAR Section 7.6.9 which discusses the switch over from injection to recirculation, and is a ESF system, the compliance with IEEE 279 has been removed from the FSAR. Justify this deletion. | Responder: Trelease<br><br>The re-write for section 7.6.9 was to provide a more concise description of the instrumentation and controls. The section was too wordy, and several topics were duplicated in section 7.3. Wording is now more closely aligned to system description.<br><br>Compliance with IEEE 279 is not intended to be removed, merely the reference to the standard in that particular section. A statement is added that 'The automatic switchover of the RHR pumps from the injection to the recirculation Mode is part of the Engineered Safety Features Actuation System (ESFAS) discussed in chapter 7.3.' Chapter 7.3 includes a reference to IEEE Standard 279-1979. The reference in 7.6.9 was therefore considered unnecessary, and therefore removed.<br><br>Attachment 9 contains FSAR excerpts required to support this response. | 262. Y | Close<br>Response is acceptable<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>TVA to issue by 10/20 | EICB RAI ML102910008 Item#66 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 17 | |
| **283** | 7.7.5 | XX | EICB (Darbali) | 8/27/2010<br><br>Follow-up to item 96 | Responder: Clark<br><br>1. Steam generator power operated relief valve control system | 263. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 10/31/10 | EICB RAI No.13 ML102910017, 10/19/10 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 17 | This item is a follow-up question to item 96. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | On Open Item 96, regarding the implementation of IEN 79-22, part of TVA's response was:<br><br>The non-safety-related device/systems within the scope of IEN 79-22 are:<br>1. Steam generator power operated relief valve control system<br>2. Pressurizer power operated relief valve control system<br>3. Main feedwater control system<br>4. Automatic rod control system.<br><br>Failure of these systems/devices due to a high energy line break is fully addressed in Chapter 15, "Accident Analysis" of the WBN Unit 2 FSAR.<br><br>Please identify the sections of FSAR Chapter 15 that address the failures of these systems. | The potential scenario for this event is addressed in 15.2.13, Accidental Depressurization of the Main Steam System.<br><br>2. Pressurizer power operated relief valve control system<br><br>The potential scenario for this event is depressurization of the reactor coolant system due to a relief valve failing open. This is addressed in 15.2.12, Accidental Depressurization of the Reactor Coolant System and 15.3.1, Loss Of Reactor Coolant From Small Ruptured Pipes Or From Cracks In Large Pipes Which Actuate The Emergency Core Cooling System.<br><br>3. Main feedwater control system<br><br>The potential scenarios for this event are:<br><br>a. A loss of feedwater due a feedwater isolation valve failing closed. This is addressed in 15.2.8, Loss of Normal Feedwater.<br>b. A feedwater regulating valve failing open. This is addressed in 15.2.10, Excessive heat removal due to feedwater system malfunctions.<br><br>4. Automatic rod control system<br><br>The potential scenarios are uncontrolled rod withdrawal events that are addressed in 15.2.1, Uncontrolled Rod Cluster Control Assembly Bank Withdrawal From A Subcritical Condition, 15.2.2, Uncontrolled Rod Cluster Control Assembly Bank Withdrawal At Power, and 15.2.3, Rod Cluster Control Assembly Misalignment. | | | | | | |
| **284** | 7.7.3 | 7.4.1 | EICB (Darbali) | 8/27/2010<br><br>Follow-up to item 123<br><br>Please provide a readable electrical logic diagram of the Volume Control Tank Level Control System. | Responder: Webber<br><br>Attachment 2 to the 10/20 letter contains the electrical logic diagrams and required Drawing Change Authorizations (DRAs). | 264. Y | Closed | Closed | EICB RAI No.14 ML102910017, 10/19/10 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 18, Attachment 7 | This item is a follow-up question to item 123 |
| **285** | 7.3.3 | 7.3 | EICB (Darbali) | 8/27/2010<br><br>Follow-up to item 22<br><br>Do the control loops meet the requirements of IEEE-279? If not are they isolated from the circuit which meets the requirements of 279. | Responder: McNeil<br><br>The Foxboro SPEC 200 components are physically arranged in the racks to meet the requirements of IEEE-279 and Watts Bar Design Criteria WB-DC-30-4, Separation/Isolation.<br><br>Foxboro (Invensys) uses two IE analog modules to isolate IE to Non-IE signals. These are Contact Output Isolator (Model Number 2A0-L2C-R Relay Output) and Voltage-to-Current Converter (Model Number 2A0-VAI), both of which have the Input and Output signals isolated. | 265. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed | EICB RAI No.15 ML102910017, 10/19/10 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 18 | This item is a follow-up question to item 22 |
| **286** | 7.7.3 | 9.3.4.2.4 | EICB (Darbali) | 8/27/2010<br><br>SE 7.7.3, Volume Control Tank Level Control System<br><br>In FSAR section 9.3.4.2.4 a change was made to the last | Responder: Webber<br><br>Low alarm is correct – the setpoint is above the low-low interlock that opens the isolation valve, mentioned earlier in the paragraph. | 266. Y | Closed<br><br>Response is satisfactory.<br><br>Response provided in letter | Closed | EICB RAI No.16 ML102910017, 10/19/10 | TVA Letter dated 10/21/10 Item No. 19 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | paragraph of the Volume Control Tank description (page 9.3-31 of the Amendment 97 redline), where the "low-low level alarm" was changed to "low level alarm".<br><br>Please explain if this deletion was an editorial change to correct a typo. | Editorial change to correct a typo. | | dated 10/21/10 | | | | |
| **287** | 7.3 | 7.3-1 | EICB (Darbali) | 8/27/2010<br><br>In Amendment 95 of FSAR section 7.3.2.3 'Further Considerations', the list of signals that would start the auxiliary feedwater motor driven and turbine driven pumps was moved to table 7.3-1 item 3, Auxiliary Feedwater. However, item (6) 'AMSAC' was not included in table 7.3-1.<br><br>Please explain this omission or state your commitment to correct this in a future amendment. | Responder: Elton<br><br>Unit 2 FSAR Section 7.3 addresses Engineered Safety Features (ESF) Actuation System. AMSAC is non-safety, and thus non-ESF. Therefore, it was correct to not include AMSAC when the initiating signals were relocated from Unit 2 FSAR Section 7.3.2.3 to Table 7.3-1. | 267. Y | Closed | Closed | ML102390538, Item No. 1, 9/10/10 and EICB RAI No.17 ML102910017, 10/19/10 | Response received in 11-9-10 TVA letter, item 7.3-1 | |
| **288** | 7.3 | | EICB (Garg) | 9/2/2010<br><br>*(1) Can we add a section to chapter 7 giving a brief overview of the Foxboro Spec 200 in Section 7.3?*<br><br>**Additional Clarification provided by the NRC**<br><br>*(2) TVA should include the list of all the functions where Spec 200 is used and discuss differences between unit 1 and unit 2. (3) This discussion should also include loops which are currently used for Unit 1 operation (4) If Spec 200 components have also been qualified to RG 1.209, it should be stated and if not why not.* | Responder: McNeil<br><br>(1) and (2) The following new section and reference will be added to the WBN Unit 2 FSAR as part of Amendment 102:<br><br>**7.3.1.1.3 Analog Instrumentation**<br><br>The miscellaneous safety-related analog process control and indication loops are made up of discrete analog modules that have been tested and qualified for use in safety related systems. The various components have been qualified to IEEE Standard 323-1983 (R-1996) IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations, IEEE Standard 344-1987 (R-1993) IEEE Standard Recommended Practices for Seismic Qualification of Class IE Equipment for Nuclear Power Generating Stations, and IEEE Standard 384-1984 (R-1992) IEEE Standard Criteria for Independence of Class IE Equipment and Circuits. The modules are arranged in instrument loops to provide the safety functions listed below:<br><br>• Turbine driven AFW Pump Flow Control<br>• Motor driven AFW pump differential pressure indication and recirculation valve control<br>• Steam generator AFW flow and level indication and control<br>• Containment Pressure indication<br>• Upper and Lower Compartment Containment Ambient Temperature indication<br>• RHR Heat Exchanger CCS Supply Header Flow<br>• Sample Heat Exchanger Header CCS Differential Flow<br>• ERCW Strainer Differential Pressure, Backwash and Flush Control<br>• CCS Heat Exchanger B Inlet Pressure<br>• CCS Surge Tank Level Control<br>• CCS Heat Exchanger B Outlet Temperature<br>• Reactor Vessel Head Vent Throttle Manual Loading Station (Unit 2 Only)<br>• EGTS Annulus Differential Pressure Control | 268. Y | Closed<br><br>**TVA committed to adding a description of the Foxboro Spec 200 hardware at the 10/12 NRC Public Meeting.** | Closed<br><br>Due 11/24/10<br><br>TVA should include the list of all the functions where Spec 200 is used and discuss differences between unit 1 and unit2. This discussion should also include loop which are currently used for Unit 1 operation If Spec 200 components have also been qualified to RG 1.209, it should be stated and if not why not. | EICB RAI ML102910008 Item#67 | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | The components are physically arranged in the racks to meet the requirements of IEEE-279 and Watts Bar Design Criteria WB-DC-30-4, Separation/Isolation. (Unit 2 Only) Two IE analog modules are used to isolate IE to Non-IE signals. These are the Contact Output Isolator and Voltage-to-Current Converter, both of which have the Input and Output signals isolated.<br><br>EMI testing and acceptance by TVA of the Foxboro Spec 200 hardware is documented in Reference [8].<br><br>**References:**<br><br>(8) Invensys Process Systems Document No. 800063-1830, "Electromagnetic Compatibility Test Reports," dated August 21, 2008, Rev. 0.<br><br>(2) As agreed to by TVA and the NRC reviewer, the level of detail necessary to describe the differences between Unit 1 and Unit 2 is down to the specific hardware manufacturer. This level of detail was agreed to not be appropriate in Chapter 7 which discusses the functions and design requirements for the plant control systems. The hardware manufacturer level of detail is addressed in Chapter 3.10 which describes the qualification of the specific hardware for safety related functions.<br><br>(3) While not specifically identified as such, loops in service for Unit 1 (Essential Raw Cooling Water etc.) are described in the FSAR chapters describing the systems the loops serve.<br><br>(4) Reg. Guide 1.209, "Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants," is not applicable to the analog Foxboro Spec 200 hardware. | | | | | | |
| **289** | | | EICB (Singh) | 9/2/2010<br><br>Provide an ISG 2 diversity analysis for the containment high range accident monitors RM-1000. | Responder: Faulkner<br><br>There are 4 Containment High Range Radiation Monitors (HRRMs) for WBN2, a pair in upper containment and a pair in lower containment. Each pair completely meets the requirements for safety related equipment including separation, independence, electrical isolation, seismic qualification, quality requirements, etc. Each monitor channel is a standalone instrument loop with traditional individual panel readout. They are not a part of a Highly Integrated Control Room (HICR) and there is no diversity question relating to the HRRMs and any HICR infrastructure. Therefore, the response to this RAI will address the functional uses of the HRRMs and the alternate and diverse instrumentation that could be used for those functions should a common mode software issue render both trains of HRRMs non-functional.<br><br>The Containment HRRMs have no automatic actuation function. They only provide indication as required by RG | 269. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed<br>- Response acceptable.<br><br>Please refer to highlighted sections of response that address NRC comments **1)** and **2)**.<br><br>Staff has the following comments on the proposed TVA response per the 10/21/submittal:<br><br>**1)** Response addresses upscale failure. Please explain how downscale failure of | RAI No. 24<br>ML102980005<br>10/26/2010 | TVA Letter dated 10/21/10<br>Enclosure 1 Item No. 20 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1.97R2. They are used at WBN for 2 functions. They are used by the operators in Emergency Operating Instructions (EOI) as one of the indications of abnormal containment conditions indicative of a Loss of Coolant Accident (LOCA) after a Reactor Trip and Safety Injection and they are used in Emergency Plan Implementing Procedures (EPIP) to assist with event classification for events which involve fuel cladding degradation.<br><br>In the EOI procedures, there are several diverse indications of containment conditions that are used to detect a LOCA and they are Containment Pressure, Containment Temperature, and Containment Sump Level. All of these instrument channels are diverse to the HRRMs in that they do not share a software platform or any integrated information or control system features. The HRRMs functional through individual, self contained, microprocessor based instrument loops. Containment Pressure and Sump Level indications are provided through Eagle 21 equipment which is completely diverse from the HRRMs. Containment Temperature is provided through Foxboro Spec 200 instrument channels which are completely diverse from the HRRMs. All of these readouts are through traditional panel meters and are not part of any HICR infrastructure.<br><br>In the EPIPs, the HRRMs are used to indicate loss of fuel clad barrier and the potential loss of a containment barrier. Potential fuel clad damage can also be determined from samples taken from the Reactor Coolant System and from Incore Thermocouple readings. RCS sampling does not rely on plant instrumentation systems and the Incore Thermocouple System uses a Common Q software platform which is diverse from the HRRMs. **2)** The accessibility required to obtain post accident samples of RCS has been demonstrated to be a viable post accident action at WBN.<br><br>Should all 4 channels of HRRMs fail upscale, Annunciator Response Instructions would be followed and they call for evacuation of containment, sampling of RCS, checking other non-accident Radiation Monitors, notification of Radiological Control personnel to investigate, potential transition to Abnormal Operating procedures for management of potential radioactive material release, and evaluation under the Emergency Plan Implementing Procedures for event classification. All of these actions are conservative actions. **1)** Should all 4 channels of the HRRMs fail downscale, the operators would turn to diverse indications as noted above before taking any further action.<br><br>Therefore, there are diverse methods and equipment sets that can be used for any functions provided by the HRRMs should both channels become nonfunctional. | | | all HRRM channels is detected and appropriate actions taken.<br><br>**2)** Please confirm that the location for obtaining the RCS sample is accessible after an accident.<br><br>Otherwise, the response is acceptable.<br><br>**Due 10/31/10** | | | |
| **290** | | 7.7 | EICB (Carte) | 9/7/2010<br><br>The equation at the bottom of Amendment 99 page 7.7-3 is wrong. There are two ways that this equation is inconsistent with the text above it. | Responder: Clark<br><br>This item is a duplicate of item 291. | 270. Y | Closed | Closed | N/A | N/A | This item is a duplicate of item 291. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| **291** | | 7.7 | EICB (Carte) | 9/7/2010<br><br>The equation at the bottom of Amendment 100 page 7.7-3 is wrong. There are two ways that this equation is inconsistent with the text above it. | Responder: Clark<br><br>The errors in the terms within the equation for total rod speed error [$T_E$] will be corrected in FSAR Amendment 101 as shown below:<br><br>$$T_E = T_{ref}\frac{1}{(1+t_2 s)} - T_{avg}\frac{(1+t_3 s)}{(1+t_4 s)(1+t_5 s)} + \left[(Q_{tu}-Q_n)\frac{t_1 s}{(1+t_1 s)}K_1 K_2\right]$$ | 271. Y | Closed | Closed | | TVA Letter dated 10/21/10 Enclosure 1 Item No. 21 | |
| **292** | 7.2.5 | 7.2 | EICB (Garg) | 9/7/2010<br><br>FSAR Section 7.2, Steam Generator Reference Leg: By letter dated July 27, 1994, TVA had withdrawn its commitment on Unit 1 to insulate SG reference leg. TVA had provided an analysis to justify this action which was accepted by the staff. Confirm whether SG reference leg in Unit 2 are insulated and if not then confirm that the analysis which was submitted for Unit 1 is also applicable to Unit 2. | Responder: Craig<br><br>The SG level transmitter reference legs are not insulated on Unit 1 and will not be insulated on Unit 2. The analysis provided for Unit 1 is also applicable to Unit 2. FSAR Section 7.2.1.1.2 (5) indicates that the Low-Low steam generator water level trip protects the reactor from loss of heat sink in the event of a loss of feedwater to one or more steam generators or a major feedwater line rupture <u>outside</u> containment. For a feedwater line rupture <u>inside</u> containment the TVA analysis credits the high containment pressure Safety Injection signal. FSAR Section 15.4.2.2 has been revised accordingly.<br><br>Reference:<br>1. Watts Bar Unit 1 SER NUREG-0847, Supplement 14.<br><br>2. Westinghouse WCAP 13462, Revision 2 | 272. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>Due 10/31/10 | EICB RAI ML102910008 Item#68 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 22 | |
| **293** | 7.7.4 | 7.2.2.3.5 | EICB (Marcus) | 9/8/2010<br><br>FSAR Amendment 100, Section 7.2.2.3.5 discusses Steam Generator Water Level and protection against low water level. However, this section does not discuss protection against Steam Generator overfill. Additionally, FSAR Section 7.2.2.3.4 discusses Pressurizer Water Level and provides minimal information concerning Pressurizer overfill. Please provide a discussion of protection against Pressurizer and Steam Generator overfill. | Responder: Craig<br><br><u>Steam Generator Overfill</u><br>FSAR Section 7.2 discusses reactor trip functions. Section 7.2.2.3.5 describes the Low-Low steam generator level reactor trip. The steam generator High-High level interlock (P-14) protects against steam generator overfill by initiating feedwater isolation and a turbine trip. Reactor trip occurs indirectly as a result of the turbine trip if power is above 50%, the P-9 interlock. This function is identified as ESFAS interlock P-14 in FSAR Section 7.3, Table 7.3-3. The High-High level interlock is also discussed in FSAR Section 10.4.7.3. Section 15.2.10 analyzes the feedwater malfunction event which causes one or more feedwater control valves to fail to the fully open position.<br><br><u>Pressurizer Overfill</u><br>The High pressurizer water level reactor trip protects against pressurizer overfill. This trip is described in FSAR Section 7.2.1.1.2 (3). Section 7.2.2.3.4 discusses specific control and protection interactions related to pressurizer level control. The high water level trip setpoint provides sufficient margin such that the undesirable condition of discharging liquid coolant through the safety valves is avoided.<br>Pressurizer level is modeled in various Chapter 15 events | 273. Y | Closed<br><br>Response is acceptable<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>NRC to issue formal RAI to TVA.<br><br>TVA to provide formal response to RAI | EICB RAI ML102861885 Item No. 22 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 19 | EICB RAI ML102861885 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | to ensure that critical protection functions will function as required. | | | | | | |
| **294** | 7.3 | 7.3.1.1.1 | EICB (Darbali) | 9/9/2010<br><br>In Amendment 95 of FSAR section 7.3.1.1.1 'Function Initiation', item (13) was arranged into paragraph form from what used to be a listing of items (a), (b) and (c).<br><br>The second bullet under item (c) was omitted in the new paragraph.<br><br>*Initiates Phase B containment isolation of the following:*<br>• *"Closure of the main steam isolation valves (MSIV) to limit reactor coolant system cooldown for breaks downstream of the MSIV's."*<br><br>Please explain this omission or state your commitment to correct this in a future amendment. | Responder: Elton<br><br>The information provided in Unit 2 FSAR Section 7.3.1.1 is not meant to describe the specific function of each item in detail; the descriptions provided are a summary listing. The omitted information provided information beyond the level of detail provided for the other items in this section.<br><br>The level of detail contained in item (13) of Unit 2 FSAR Section 7.3.1.1 is consistent with that contained in item 13. of Unit 1 UFSAR Section 7.3.1.1. | 274. Y | Closed | Closed | ML102390538, Item No. 2, 9/10/10 | Response received in 11-9-10 TVA letter, item 7.3-2 | |
| **295** | 7.3 | 7.3.1.1.2 | EICB (Darbali) | 9/9/2010<br><br>In Amendment 95 of FSAR section 7.3.1.1.2 'Process Protection Circuitry', item (3), references to sections 7.6 and 7.7 were removed.<br><br>Please explain the reason for removal. | Responder: Elton<br><br>The level of detail is sufficient for this section without the two removed references to other Sections.<br><br>The level of detail contained in item (3) of Unit 2 FSAR Section 7.3.1.1.2 is consistent with that contained in item 3. of Unit 1 UFSAR Section 7.3.1.1.2. | 275. Y | Closed | Closed | ML102390538, Item No. 3, 9/10/10 | Response received in 11-9-10 TVA letter, item 7.3-3 | |
| **296** | 7.3 | 7.3.1.2.1 | EICB (Darbali) | 9/9/2010<br><br>In Amendment 95 of FSAR section 7.3.1.2.1 'Generating Station Conditions', the new paragraph was arranged from what used to be a listing of items (1.b), (1.c), and (2.b), leaving out items (1.a) and (2.a). Even if the paragraph contains the word 'include', the breaks in items (1.a) and (2.a) should be listed.<br><br>Please explain this omission or state your commitment to correct this in a future amendment. | Responder: Elton<br><br>The information provided in Unit 2 FSAR Section 7.3.1.2.1 is not meant to provide detailed information describing what each condition includes. Deletion of the breaks described in Items (1.a) and (2.a) is justified because they are encompassed by the operating conditions primary system breaks and secondary system breaks, respectively.<br><br>The level of detail contained in Unit 2 FSAR Section 7.3.1.2.1 is consistent with that contained in Unit 1 UFSAR Section 7.3.1.2.1. | 276. Y | Closed | Closed | ML102390538, Item No. 4, 9/10/10 | Response received in 11-9-10 TVA letter, item 7.3-4 | |
| **297** | 7.3 | 7.3.1.2.2 | EICB (Darbali) | 9/9/2010<br><br>In Amendment 95 of FSAR section 7.3.1.2.2 'Generating Station Variables', the following sentence was erased:<br><br>*Post accident monitoring requirements and variables are given in Tables 7.5-1 and 7.5-2.*<br><br>Please explain the reason for removal. | Responder: Elton<br><br>Unit 2 FSAR Section 7.3 addresses Engineered Safety Features (ESF) Actuation System. Post accident monitoring is not an ESF; thus, a reference to it is not required in 7.3.1.2.2. | 277. Y | Closed | Closed | ML102390538, Item No. 5, 9/10/10 | Response received in 11-9-10 TVA letter, item 7.3-5 | |
| **298** | 7.3 | XX | EICB (Darbali) | 9/9/2010<br><br>IE Bulletin 80-06 calls for review of engineered safety features with the objective of ensuring that no device will change position solely because of the 'reset' action.<br><br>In Supplement 3 of NUREG-0847, section 7.3.5, the staff approved the design modifications proposed by the applicant that would allow certain devices to remain unchanged upon an ESF reset. | Responder: Clark<br><br>A review of the schematic diagrams for the WBN Unit 2 valves listed in SER 3 found the following:<br><br>(1) For feedwater isolation valves (FCV-3-33, FCV-3-47, FCV-3-87, and FCV-3-100), feedwater check valve bypass valves (FCV-3-185, FCV-3-186, FCV-3-187, and FCV-3-188), and upper tap main feedwater | 278. Y | Closed | Closed | ML102390538, Item No. 6, 9/10/10 | Response received in 11-9-10 TVA letter, item 7.3-6 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | The staff also found acceptable the applicant's justification for some safety-related equipment that does not remain in its emergency mode after an ESF reset.<br><br>Please confirm whether or not the equipment that was determined in NUREG-0847 and its supplements to remain unchanged upon an ESF reset will still remain unchanged in Unit 2. | isolation valves (FCV 3-236, FCV-3-239, FCV-3-242, and FCV-3-245), the Unit 2 equivalent reset switch and a relay have been added for each steam generator loop. When the engineered safety feature (ESF) signal is reset, the individual valve will not change state until both the loop and the ESF train reset switches have been reset.<br><br>(2) For steam generator blowdown isolation valves (FCV-43-54D, FCV-43-56D, FCV-43-59D, FCV-43-63D, FCV-43-55, FCV-43-58, FCV-43-61, and FCV-43-64), the ESF signal is sealed in by means of a seal in relay. The individual valve will not change state until a hand switch in the sample room is used to reopen the individual valve.<br><br>(3) For residual heat removal heat exchanger outlet flow control valves (FCV-74-16 and FCV-74-28), the ESF signal is sealed in by the limit switch. The Unit 2 equivalent reset switch has been added at the control room control board. When the ESF signal is reset, the individual valve will not change state until the individual reset switch has been reset. | | | | | | |
| **299** | | | EICB (Carte) | Provide Common Q Software Requirements Specification Post Accident Monitoring System 00000-ICE-3238 Rev. 5 | Attachment 41 of the 10/5 letter contains the Common Q Software Requirements Specification Post Accident Monitoring System 00000-ICE-3238 Rev. 5 and the affidavit for withholding. | 279. Y | Closed<br><br>Response provided in letter dated 10/5/10 | Closed | | TVA Letter dated 10/5/10 | |
| **300** | | | EICB (Singh) | Need Radiation Monitoring System Description/Design Criteria<br><br>Are detectors different from Unit 1. Describe any differences.<br><br>Are there any commercially dedicated parts in the RM-1000? If so, how are they dedicated?<br><br>Please confirm that digital communication ports available in RM-1000 are not used. | Responder: Temples/Mather<br><br>(1) The Radiation Monitoring Design Criteria Document, WB-DC-40-24, Revision 21 is contained in Attachment 6 to letter dated October 31, 2010.<br><br>(2) Attachment 7 contains the General Atomics detector differences report. The containment high range radiation monitors are loops 271-274.<br><br>(3) For safety-related applications, General Atomics Electronic Systems, Inc. supplies the RM-1000 module assembly as a Basic Component. This assembly does contain component parts that are Safety-Related Commercial Grade Items (SRCGI). Because these SRCGI components are assembled into the delivered Basic Component, they are dedicated to the assembly by virtue of the acceptance test of the full RM-1000 assembly. Safety-related commercial grade items are dedicated in accordance with General Atomics approved 10 CFR 50 Appendix B program.<br><br>(4) The digital communications ports on the safety-related RM-1000 radiation monitors are not used.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>General Atomics Electronics Systems, Inc. is an approved 10 CFR 50 Appendix B supplier. They have a commercial grade dedication program. | 280. Y | Closed<br><br>Response is included in letter dated 10/29/10<br><br>Revised response Included in letter dated 11/24/10 | Closed<br><br>Due 11/24/10<br><br>TVA to address the following comments:<br><br>(1) Is it Att. 5 or Att. 6?<br>(2) Pl. confirm that HRRMs are loops 271-274.<br>(3) TVA to clarify that GA has a commercial dedication program in place and that GA is an approved 10CFR50, App. B supplier.<br>App B does not address commercial grade dedication .<br><br>Revised response is acceptable. Please submit response. | RAI No. 25<br>ML102980005<br>10/26/2010 | TVA Letter 11/24/10, item 4, and TVA letter 10/29/10 Enclosure 1 Item No. 20 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | (4) Response acceptable. | | | |
| **301** | | | EICB (Singh) | 1.TVA is requested to address the consequences of software common cause failure including all potential resulting failures (i.e. total loss of CERPI, system fail as-is).<br><br>2. In addition, address how the actions stipulated in the plant Technical Specifications will be taken when the CERPI system indications are lost. Information notice IN 2010-10 (ML100080281) addresses the need to consider software failures and the actions required to assure that the plant will stay within its licensing basis.<br><br>3. Provide FMEA in support of your response.<br><br>4. FSAR Table 7.7-1, Plant Control System Interlocks lists interlock C-11 to block automatic rod withdrawal when 1/1 Control Bank D rod position is above setpoint. This interlock capability would be lost in case of total loss of CERPI. How is the rod block assured for this event?<br><br>5. How is automatic rod withdrawal affected in case of total loss of signals from the CERPI to the ICS? Is this interlock fail safe?<br><br>6.FSAR chapter 15, Section 2.3.2.1states that the resolution of the rod position indicator channel is 5% of span (7.2 inches). The CERPI system accuracy specified in the CERPI System requirements Specification, WNDS-DS-00001_WBT, Rev. 2 is 12 steps or 5.19%. The specified system accuracy seems to be greater than the accuracy assumed in the FSAR Chapter 15. Please clarify this anomaly. | **Responder: WEC/Davies/Clark**<br><br>**TVA Partial Response:**<br><br>For all accidents analyzed in WBN Unit 2 FSAR, Chapter 15, no credit is taken for the rod position indication system. For all continuous rod withdrawal accidents analyzed in WBN Unit 2 FSAR, Chapter 15, no credit is taken for any rod stop/block.<br><br>**(1)** Technical Specification 3.1.8, Rod Position Indication, does not have an action for total loss of indication; therefore, a total loss of CERPI puts the plant into LCO 3.0.3 which states:<br><br>When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:<br><br>MODE 3 within 7 hours;<br>MODE 4 within 13 hours; and<br>MODE 5 within 37 hours.<br><br>Exceptions to this Specification are stated in the individual Specifications. Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required.<br><br>**(2)** CERPI common mode software failure<br><br>**Description of the CERPI systems installed at Watts Bar (Unit 1 & 2):**<br><br>Each Programmable Logic Controller (PLC), Maintenance Test Panel (MTP), and Operators Module (OM) is isolated within its own Train, A or B. Rod position information is provided to the OMs in the main control room via redundant data links. Each train (PLC, MTP, and OM) is electrically isolated from the other train.<br><br>Communications within a CERPI train (PLC, MTP, and OM) are continuously monitored. If communication is interrupted, this condition is annunciated to the operator in the control room. The MTP and OM display screens have rotating cursors in the upper right-hand corner of the display to indicate that the system is operating.<br><br>**History of CERPI:**<br><br>The basic PLC software associated with the CERPI | 281. Y | Closed<br><br>Revised response included in letter dated 12/22/10.<br><br>Revised response included in letter dated 11/24/10.<br><br>Partial response in 10/29 letter. | Closed<br><br>Due 12/22/10<br><br>1) Please address how fail-as-is is detected i.e. alarms, rod position deviation alarms, etc.<br>2) Response acceptable.<br>3) Response acceptable.<br>4) a. Response acceptable.<br>b. Pl. address failure mode on fail-as-is.<br>5) Response acceptable.<br>6) Response acceptable.<br><br>TVA to address common cause failure as stated under response item 2.<br><br>Please explain how various alarms will continue to annunciate on software lockup? Need better explanation to understand the rationale behind the response.<br><br>Further response required to address CCF:<br><br>Total failure of software and lock-up alone would normally be detected. Staff is also concerned by undetected failure within the digital system that could prevent proper system operation. A failure or fault that is detected can be addressed; however, failures that | RAI No. 11 ML102980005 10/26/2010 | TVA Letter dated 10/29/10 (Encl 1, Item 21) and letter dated 12-22-10 (Encl 1, item 25) | Note 1:<br><br>Effects of common cause software failure are addressed in DI&C-ISG-02 (ML091590268) Section 4 on pages 8 and 9. This document is publically available. Some excerpts are as follows:<br><br>*"For example, a failure to trip might not be as limiting as a partial actuation of an emergency core cooling system, with digital indications of a successful actuation. In cases such as this, it may take an operator longer to evaluate and correct the safety system failure than it would if there was a total failure to send any actuation signal. For this reason, the evaluation of failure modes as a result of software CCF should include the possibility of partial actuation and failure to actuate with false indications, as well as a total failure to actuate.*<br><br>*The primary concern is that an undetected failure within the digital system could prevent proper system operation. A failure or fault that is detected can be addressed; however, failures that are non-detectable may prevent a system actuation when required. Consequently, non-detectable faults are of concern."* |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | system has been in use for over ten years. The first plant to utilize the CERPI PLC software was Beaver Valley. In 2003, the CERPI software was deployed with interfaces to the Common Q MTP and OM interfaces within the systems for Surry Units 1 & 2, and Watts Bar Unit 1. In 2009, the Watts Bar Unit 1 CERPI system was modified to allow for two independent trains of CERPI. The Watts Bar Unit 2 CERPI system is based on the Unit 1 design. Only the detectors and the detector interface boards are not redundant within the Watts Bar CERPI systems.<br><br>**CERPI Software Failure Analysis**<br><br>With regard to the CERPI system software:<br><br>• The software used on PLC-A is identical to that used on PLC-B.<br>• The software used on MTP-A is identical to that used on MTP-B<br>• The software used on OM-A is identical to that used on OM-B.<br><br>A common cause failure affecting the software of one CERPI train would affect the other train as well. Common cause problems associated with the CERPI software were mitigated by the Westinghouse software development process, factory acceptance testing, and site acceptance testing. There is no "fail as-is" scenario. Any failure of a hardware/software component (resulting in processor lock-up) would be immediately annunciated (Main Control Room alarm). A loss of communication to the MTP, or OM would be annunciated, and the data values on the flat panel display would be displayed in magenta (indicating failure). A hardware/software failure in the PLC (resulting in processor lock-up) would result in an annunciator because of the watchdog alarm circuit associated with the PLC processor module.<br><br>A total loss of CERPI indication (e.g., loss of both AC power sources to the rod position cabinets) is possible, but this condition would be immediately annunciated. A complete loss of CERPI indication would lead to entering Technical Specification LCO 3.0.3. A more likely scenario would be loss of a single train of CERPI due to a hardware failure; in which case, there are no technical specification conditions to enter because a single train is capable of providing all rod indications needed for control.<br><br>**(3)** There is no FMEA for the CERPI system.<br><br>**(4)** Control Bank D Automatic Rod Withdrawal Limit would be assured by Operations and control circuitry by the following 2 methods:<br><br>a. A simultaneous failure of all indications of the Rod | | | are non-detectable may prevent a system actuation when required or may result in a partial actuation. Please address the consequences of an undetected failures on system operation and alarms and interlocks including control bank D interlock. (See note 1 in the Comments column of this open item for reference) | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Position Indication System places the plant in LCO 3.0.3, since it would prevent compliance with actions in LCO 3.1.8.<br><br>b. CERPI cabinet relays A-KX-18 and B-KX-18 are the PLC controlled components of Rod Withdrawal Limit. The relays are "active low" requiring power to activate the contacts in the control circuit. Total loss of CERPI will open the contacts and block Automatic Rod Withdrawal. Additionally, Annunciator window 64F will annunciate to show "C-11 BANK D AUTO WITHDRAWAL BLOCKED."<br><br>**(5)** The CERPI Maintenance and Test Panels are used to set the Rod Withdrawal Limit with output signal to ICS as a parallel path. As stated above, the relays are the controlling functions and loss of signal to ICS will not affect the capability of the control circuit to disable the Automatic Rod Withdrawal function. The C-11 interlock is fail safe with regards to loss of power.<br><br>**(6)** The cycle-specific analyses for the static rod misalignment assume full misalignment of an individual rod from the bank position indicator(s). Such a misalignment exceeds that which is possible during plant operations when accounting for the most adverse combination of the rod deviation alarm and uncertainty of the rod position indicator (both 12 steps). For consistency of parameter (and units) with the deviation alarm and position indicator uncertainty, the WBN Unit 2 FSAR Chapter 15, Section 2.3.1 will be revised in Amendment 102 to read:<br><br>"The resolution of the rod position indicator channel is ± 12 steps. Deviation of any RCCA from its group by twice this distance (24 steps) will not cause power distributions worse than the design limits. The deviation alarm alerts the operator to rod deviation with respect to group demand position in excess of 12 steps. If the rod deviation alarm is not operable, the operator is required to take action as required by the Technical Specifications."<br><br>This change is consistent with FSAR section 4.3.2.2.5, Limiting Power Distributions Page 4.3-13, which states the maximum deviation assumed is 12 steps.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>1. The following response is based on the information contained in Westinghouse letter WBT-D-2722 "Response To Question On CERPI RAI #301," dated December 6, 2010 (Reference **Error! Reference source not found.**).<br><br>TVA believes the follow-up question is related to the statement found in the response to question 2 of NRC Matrix Item 301, submitted on TVA Letter to NRC | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Watts Bar Nuclear Plant (WBN) Unit 2 – Instrumentation and Controls Staff Information Requests, dated November 24, 2010, (Reference **Error! Reference source not found.**) "Any failure of a hardware/software component (resulting in processor lock-up) would be immediately annunciated (Main Control Room alarm)"<br><br>The CERPI system will not annunciate various system alarms if the software is in a lockup condition. However, the system will annunciate an alarm based on the PLC watchdog relay dropping out because the software has "locked up" the processor. So, even if the PLC locks up, an alarm is generated to alert the operators in the Main Control Room (MCR).<br><br>The CERPI system alarms (that connect to the plant annunciator system) are wired to specific alarm relays within the CERPI system. With the exception of the watchdog alarm relay, the alarm relay coils are actuated by the PLC Digital Output Module. The plant annunciator wiring connects to either the Normally Open (NO) or the Normally Closed (NC) contacts of the associated alarm relay. The watchdog relay is configured such that when a timeout condition occurs (the PLC locks up), the watchdog relay de-energizes, and a CERPI System Trouble alarm is annunciated in the MCR.<br><br>2. <u>As previously stated:</u><br><br>a. <u>F</u>or all accidents analyzed in WBN Unit 2 FSAR, Chapter 15, no credit is taken for the rod position indication system. For all continuous rod withdrawal accidents analyzed in WBN Unit 2 FSAR, Chapter 15, no credit is taken for any rod stop/block. Based on this, an undetected failure of the CERPI would not have any impact on the WBN Unit 2 accident analysis.<br><br>b. Concerning the impact on Bank D, CERPI cabinet relays A-KX-18 and B-KX-18 are the PLC controlled components of Rod Withdrawal Limit. The relays are "active low" requiring power to activate the contacts in the control circuit. Total loss of CERPI will open the contacts and block Automatic Rod Withdrawal. Additionally, Annunciator window 64F will annunciate to show "C-11 BANK D AUTO WITHDRAWAL BLOCKED." Therefore, this would not result in an undetected failure. In the event of an undetected failure that kept relays A-KX-18 and B-KX-18 energized, the worst case scenario would be a continuous rod withdrawal event. This event is already addressed in the Chapter 15 accident continuous rod withdrawal accident analysis which takes no credit for rod stops/blocks. | | | | | | |
| **302** | 7.5.2.1 | 7.5.1 | M a | 09/17/2010 | Responder: Tindell | 282. Y | Closed | Closed | EICB RAI | TVA Letter dated | EICB RAI ML102861885 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Item 208 requested a description of the changes that were performed under 10 CFR 50.59 for 16 Unit 1 PAM variables that were identified in Enclosure 1 Item No.6 of the letter dated June 18, 2010 (ML101940236). Please identify the specific 10 CFR 50.59 documentation that applies to each of these 16 variables. | Attachment 8 contains the requested 50.59 evaluations and the variable table cross referencing the variable to the appropriate DCN. There are two changes to the original table. Variable 9, RCS Pressurizer Level and 10, RCS Pressure Wide Range have been changed from 50.59 Y to N. The original response showed these variables as changed under 10 CFR 50.59. The response was based on the plan to replace all paper recorders in Unit 1. The assumption was that these recorders would be replaced prior to Unit 2 startup. While this may still occur, the recorders have not been replaced at this time. | | Response is acceptable<br><br>Response is included in letter dated 10/29/10 | NRC to issue formal RAI to TVA<br><br>TVA to provide formal response to RAI | ML102861885 Item No. 23 | 10/29/10 Enclosure 1 Item No. 22 | See Item 332 |
| **303** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 09/17/2010<br><br>Enclosure 1 Item 6 of the letter dated June 18, 2010 included a column to indicate the Unit 2 variable source for each PAM variable and also if the variable was unique to Unit 2. For each variable that was indicated as unique to Unit 2 and the Unit 2 variable source is (1) Foxboro Spec 200, (2) Common Q PAMS, or (3) Foxboro IA, identify the Unit 1 variable source. | Responder: Tindell<br><br>Attachment 9 contains the cross reference between the Unit 2 and Unit 1 variable sources for the unique WBN Unit 2 variables within the scope of the Foxboro Spec 200, Common Q PAMS and Foxboro I/A changes.<br><br>NOTE: An error was identified during preparation of this response. Variable 37 CCS Surge Tank Level was incorrectly identified as being within the scope of the Foxboro I/A system in TVA to NRC letter dated June 18, 2010. Variable 37 will be provided by the Foxboro Spec 200 system for Unit 2. | 283. Y | Closed<br><br>Response is acceptable<br><br>Corrected response is included in letter dated 10/29/10 | Closed<br><br>NRC to issue formal RAI to TVA<br><br>TVA to provide formal response to RAI | EICB RAI ML102861885 Item No. 24 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 23 | EICB RAI ML102861885 sent to DORL<br><br>See Item 333 |
| **304** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 09/17/2010<br><br>Enclosure 1 Item 6 of the letter dated June 18, 2010 indicated that the Unit 2 variable source for 14 PAM variables is Eagle 21. Please confirm that for each of these 14 variables the Unit 1 variable source is also the Eagle 21. | Responder: Tindell<br><br>The source for the Unit 1 variables is the Eagle 21 System. | 284. Y | Closed<br><br>Response is included in letter dated 10/29/10<br><br>Response is acceptable | Closed<br><br>NRC to issue formal RAI to TVA<br><br>TVA to provide formal response to RAI | EICB RAI ML102861885 Item No. 25 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 24 | EICB RAI ML102861885 sent to DORL |
| **305** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 09/17/2010<br><br>Enclosure 1 Item 6 of the letter dated June 18, 2010 indicated that the Unit 2 variable source for 2 PAM variables is the Integrated Computer System. Please confirm that for these 2 variables the Unit 1 variable source was the Unit 1 plant computer system. | Responder: Tindell<br><br>The source for the Unit 1 variables is the Integrated Computer System. | 285. Y | Closed<br><br>Response is included in letter dated 10/29/10<br><br>Response is acceptable | Closed<br><br>NRC to issue formal RAI to TVA<br><br>TVA to provide formal response to RAI | EICB RAI ML102861885 Item No. 26 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 25 | EICB RAI ML102861885 sent to DORL |
| **306** | 7.1 | 7.1 | EICB (Garg) | FSAR amendment 100, page 7.1-12 provides the definition of Allowable value which is not consistent with TSTF-493 as allowable value is the value beyond which instrument channel is declared inoperable. | Responder: Hilmes<br><br>The FSAR Allowable Value definition will be revised to be consistent with the TSTF-493 in FSAR Amendment 102. Attachment **3** contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change. | 286. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 12/17/10<br><br>Pending FSAR Amendment 102 submittal | EICB RAI ML102910008 Item#69 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 26 | |
| 307 | 7.1 | 7.1 | EICB (Garg) | (1) FSAR amendment 100, Section 7.1, page 7.1-12, definition of Acceptable as found tolerance is not in accordance with TSTF-493 as AAF is the limit beyond which the instrument channel is degraded but may be operable and its operability must be evaluated. (2) Also it states that AAF is based on measurable instrument channel uncertainties, such as drift, expected during the surveillance interval. These wording should be revised to agree with the wording given in RIS2006-17 as these wordings are very vague. (3) Also it states that RPS functions use double sided tolerance limits for the AAF. Since AAF is a band it will always be | Responder: Hilmes<br><br>(1) The Acceptable As Found (AAF) definition will be revised to be consistent with TSTF-493 in FSAR Amendment 102. Attachment 3 contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change.<br><br>(2) Additional detail on the AAF methodology was provided in sections 7.1.2.1.9.1, Westinghouse Setpoint | 287. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 12/17/10<br><br>Pending FSAR Amendment 102 submittal | EICB RAI ML102910008 Item#70 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 27 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | double sided and therefore, this clarification does not mean anything and it clouds the issue. | Methodology, and 7.1.2.1.9.2, TVA Setpoint Methodology. These sections will be revised to clarify the AAF calculations in FSAR Amendment 102. Attachment 3 contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change.<br><br>(3) The statement about double sided limits addresses a TSTF requirement that the AAF tolerance consider errors in both the conservative and non-conservative directions and ensures that an as-found value which exceeds these limits, even in the conservative direction (away from the safety limit), will be evaluated. Attachment 3 contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change. | | | | | | |
| **308** | 7.1 | 7.1 | EICB (Garg) | (1) FSAR Amendment 100, Section 7.1, page 7.1-13, definition of Acceptable as left tolerance is not in accordance with TSTF-493 as it states that this may take calibration history into consideration. This is very vague and ambiguous. (2) Also it states that RPS functions use double sided tolerance limits. Since ALF is a band it will always be double sided and therefore, this clarification does not mean anything and clouds the issue. | Responder: Hilmes<br><br>(1) The statement about using calibration history to determine the Acceptable As Left (AAL) will be deleted in FSAR Amendment 102. Attachment 3 contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change.<br><br>(2) See response to letter item 27 (NRC Matrix Item 307). | 288. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 12/17/10<br>Pending FSAR Amendment 102 submittal | EICB RAI ML102910008 Item#71 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 28 | |
| **309** | 7.1 | 7.1.2.1.9.1 | EICB (Garg) | (1) FSAR amendment 100, Page 7.1-14, Westinghouse setpoint methodology, states that AAF is the algebraic sum of the ….. This is not acceptable. As algebraic sum is non conservative compared to the SRSS method and will mask the operability of the instrument channel and therefore, it is not acceptable to the staff. (2) It also make the statement that ALT may take calibration history into consideration which is vague and ambiguous. | Responder: Hilmes<br><br>(1) The AAF calculation for Westinghouse setpoint methodology calculations in TI-28 for TSTF-493 will be revised to use the Square Root Sum of the Squares (SRSS) method.<br><br>(2) AAF definition will be revised to be consistent with TSTF-493 as discussed with the NRC Staff, in FSAR Amendment 102. Attachment 3 contains the revised FSAR Amendment 102 Change Markup that reflects this change. | 289. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 12/17/10<br><br>Pending FSAR Amendment 102 submittal | EICB RAI ML102910008 Item#72 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 29 | |
| **310** | 7.1 | 7.1.2.1.9.2 | EICB (Garg) | (1) FSAR amendment 100, Page 7.1-14, TVA setpoint methodology, states that for AAF ….and other measurable uncertainties as appropriate (i.e., those present during calibration….) should be changed to present during normal operation…… (2) Also on page 7.1-15, states that ALT may take calibration history into consideration which is vague and ambiguous. | Responder: Hilmes<br><br>**TVA Response:**<br><br>(1) The AAF definition will be revised in FSAR Amendment 102 to read:<br><br>"A tolerance band on either side of the NTSP which defines the limits of acceptable instrument performance, beyond which the channel may be considered degraded and must be evaluated for operability prior to returning it to service. Channels which exceed the AAF will be entered into the Corrective Action Program for further evaluation and trending. The Acceptable As Found tolerance is the SRSS combination of drift, maintenance and test equipment (M&TE) accuracy and readability, and calibration/reference accuracy. Other uncertainties may be included in the AAF if applicable." | 290. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 12/17/10<br><br>Pending FSAR Amendment 102 submittal | EICB RAI ML102910008 Item#73 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 30 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | This revision eliminates the concern regarding uncertainties. Attachment 3 contained in the October 29, 2010 letter provided the revised FSAR Section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change.<br><br>(2) The AAL definition will be revised in FSAR Amendment 102 to read:<br><br>"A tolerance band on either side of the NTSP within which an instrument or instrument loop is left after calibration or setpoint verification. The Acceptable As Left tolerance is equal to or less than the SRSS combination of reference accuracy, M&TE accuracy and M&TE readability. Other uncertainties may be included in the AAL if applicable."<br><br>This revision eliminates the concern regarding calibration history. Attachment 3 contained in the October 29, 2010 letter provided the revised FSAR Section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change. | | | | | | |
| 311 | 7.1 | 7.1 | EICB (Garg) | Both Westinghouse and TVA setpoint methodology do not have any discussion on single sided calculation. Please confirm that single sided calculation has not been used for all setpoints with TSTF-493 and provide a statement to that effect in the FSAR. | Responder: Hilmes<br><br>A statement that single-sided corrections are not used for TSTF-493 setpoints will be included in FSAR Amendment 102. Attachment 3 contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects this change. | 291. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 12/17/10<br><br>Pending FSAR Amendment 102 submittal | EICB RAI ML102910008 Item#74 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 31 | |
| **312** | | 7.0 | EICB (Garg) | By letter dated September 10,2010, TVA provided the summary evaluation of 50.59 reports which were related to FSAR Chapter 7.0. However, these evaluation only covers Amendments 0 thru 8. Provide all other evaluation which have been done since these amendments and which forms the basis for FSAR Chapter 7.0 systems. | Responder: Stockton<br><br>Amendment 8 is the current version of Unit 1 UFSAR. | 292. Y | Close<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>Due 10/31/10 | EICB RAI ML102910008 Item#75 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 23 | |
| 313 | 7.7.8 | 7.7.1.12 | EICB (Darbali) | EDCR 52408 (installation of AMSAC in Unit 2) states that Design Criteria WB-DC-40-57 needs to be modified to reflect AMSAC in Unit 2.<br><br>1. Has WB-DC-40-57 been completed for Unit 2? If so, please submit.<br><br>2. If WB-DC-40-57 has not been completed for Unit 2, please give an estimated date of completion and submittal.<br><br>3. Please submit WB-DC-40-57 for Unit 1 and identify any changes to the Unit 2 version. | Responder: Ayala<br><br>(1) The review of WB-DC-40-57 for Unit 2 applicability has been completed and included in Revision 4 of the document. Attachment 10 contains TVA design criteria WB-DC-40-57, Revision 4, Anticipated Transients Without Scram Mitigation System Actuation Circuitry (AMSAC).<br><br>(2) The revision for Unit 2 is complete with open items as identified in item (3) below.<br><br>Attachment 10 contains TVA design criteria WB-DC-40-57, Revision 4, Anticipated Transients Without Scram Mitigation System Actuation Circuitry (AMSAC) which is applicable to both WBN Unit 1 and Unit 2. There are 17 open Watts Bar Nuclear Plant Unit 2 Startup Integration Task Equipment List (WITEL) punch list items associated with Revision 4 that require resolution. A list of the punch list items is contained in Attachment 10. | 293. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed | EICB RAI No.18 ML102910017, 10/19/10 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 32 | |
| **314** | 7.3 | 7.3 | (Dar | The following 50.59 changes were listed in the March 12 RAI response letter (item 10) but were not included in the September 9 | Responder: Stockton | 294. Y | Closed | Closed | EICB RAI No. 19 ML102910017, | TVA Letter dated 10/21/10 | Related to OI 10 |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | submittal of 50.59 safety evaluations. Please submit the 50.59 safety evaluations for the following changes:<br>• **DCN 38842** (Revise OTΔT and OPΔT turbine runback setpoints)<br>• **DCN 50991** (Install Test Points)<br>• **DCN 51124** (Eliminate spurious ICS alarms associated with the SSPS | Attachment 8 contains the requested safety evaluations. | | Response provided in TVA letter dated 10/21/10. | | 10/19/10 | Enclosure 1 Item No. 24 | |
| **315** | 7.5.3 | 7.5.3 | EICB (Garg) | IE Bulletin 79-27 required that emergency operating procedures to be used by control room operators to attain safe shutdown upon loss of any Class IE or non Class IE bus are adequate. WBN1 has performed the review and documented their conclusion. Confirm that WBN2 emergency procedures are adequate to achieve safe shutdown in the event of loss of any Class IE or non-Class IE bus. | Responder: S. Smith (TVA Operations)<br><br>While the WBN Unit 2 Emergency Operating Procedures (EOPs) have not been written, they will be written the same as the Unit 1 EOPs. WBN Unit 1 personnel will perform validations to ensure that WBN Unit 2 EOPs will perform the required actions. The WBN Unit 2 EOPs will be written and validated prior to Unit 2 fuel load. | 295. Y | Close<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>Due 10/31/10 | EICB RAI ML102910008 Item#76 | TVA Letter dated 10/21/10 Enclosure 1 Item No. 25 | |
| **316** | 7.5.2.3 | 7.5 | EICB (Singh) | TVA has provided various documents in support of RM-1000 high range monitors for WBN2.<br>Please clarify the following:<br>RM-1000 v1.1 Software Verification Report 04508006 (Sequoyah)<br>RM-1000 v1.2 Software Verification Report 04508006 (Sequoyah)<br>RM-1000 System Verification Test Results (Sequoyah)<br><br>These documents were prepared for the Sequoyah plant. IS the version provided applicable to WBN2? Please confirm and explain if these documents are applicable to WBN 2 as provided or with differences? | Responder: Temples/Mather<br><br>The Sequoyah RM-1000 v1.1 Software Verification Report 04508006 and RM-1000 v1.2 Software Verification Report 04508006 are applicable to WBN Unit 2.<br><br>The RM-1000 System Verification Test Results report is not applicable to WBN Unit 2. This document was for the non-safety related software and was superseded by the 04508006 v1.1 and v1.2 reports for the safety-related software. | 296. Y | Closed<br><br>Response provided in letter dated 10/21/10 | Closed<br><br>Response acceptable per TVA letter of 10/21/10, Enclosure 1, Item 26. | RAI No. 26 ML102980005 10/26/2010 | | |
| **317** | 7.5.2.3 | 7.5 | EICB (Singh) | TVA has provided a proprietary and a non-proprietary version of Technical Manual for RM-1000 Digital Radiation Processor under ML101680582 and ML101680587).<br><br>(i) Are these documents applicable to WBN2 as provided (October 2003 version).<br>(ii) Why is DCN38993-A attached at the back of the proprietary version? It is for WBN1 Turbine Governor Control Valve.<br>(iii) This document does not state the requirements for RM-1000 units. Please provide a document that states the requirements for the RM-1000 radiation monitors for WBN2. | Responder: Temples<br><br>i. These documents are applicable to WBN Unit 2.<br>ii. This was an error in document preparation that occurred when attachments were assembled for a previous letter.<br>iii. The Technical Manual is not intended to include equipment requirements. Requirements would be found in the applicable TVA Specifications for the contract.<br><br>Attachment 11 contains the Material Requisition Specification Revisions 1 and 4 which contain the requested information. | 297. Y | Closed<br><br>Response is included in letter dated 10/29/10<br><br>**(iii) Staff is looking for high level requirements for RM-1000 monitors. Pl. provide appropriate documents**. | Closed<br><br>Proposed response is acceptable.<br><br>Due 10/31/10 | RAI No. 27 ML102980005 10/26/2010 | TVA Letter dated 10/29/10 Enclosure 1 Item No. 33 | |
| **318** | 7.5.2.3 | 7.5 | EICB (Singh) | TVA has provided the following documents for RM-1000 equipment qualification:<br><br>(i) Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter 04508905-QR (January 2001)<br>(ii) Qualification Test Report Supplement, RM-1000 Upgrades 04508905-1SP (June 2006)<br>(iii) Qualification Test Report Supplement, RM-1000 Upgrades 04508905-2SP (June 2008)<br>(iv) Qualification Test Report Supplement, RM-1000 Upgrades 04508905-3SP (May 2008)<br><br>Please clarify whether all of these are fully applicable to WBN2 or | *Responder: Temples*<br><br>*(i) Applicable to WBN Unit 2. 04508905-1QR is applicable only in regards to the RM-1000, with the exception of re-qualification of certain RM-1000 equipment differences covered in the -1SP report. The Current-to-Frequency (I-F) converter module qualifications in the base report and the -1SP report are not applicable to the RM-1000s, and will be used later as references in the WBN Unit 2 specific qualification reports.* | 2. N | Open<br><br>Revised response is included in letter dated 12/22/10.<br><br>**Note check 04508905-1QR or QR. Staff version is QR only.**<br><br>Response is included in letter dated 10/29/10 | Open-TVA/Bechtel<br><br>Due 2/25/11<br><br>Response update required. It is clear that 04508903-2SP and -3SP are not applicable. The response for applicability of 04508905-QR and -1SP to RM-1000 and IF converter is not clear. | RAI No. 28 ML102980005 10/26/2010 | TVA Letter dated 10/29/10, Encl 1 Item 34, and TVA letter 11/24/10, Att. 2. | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | are they applicable with exceptions? If with exceptions, then please clarify what those are.<br><br>Supplement 3 was issued one month prior to supplement 2. Please explain the reason for the same. | *(ii) Applicable to WBN Unit 2.*<br><br>*(iii) Not applicable to WBN Unit 2*<br><br>*(iv) Not applicable to WBN Unit 2*<br><br>*The 04508905-3SP report was prepared for another TVA plant, as a monitor system-level report, where the system included equipment mostly based on the base report equipment items. These two -2SP and -3SP supplement reports were essentially worked concurrently, but the -2SP document review/release process resulted in the release time difference.*<br><br>**TVA Response to Follow-up NRC Request:**<br><br>**NOTE:** The response for the current to frequency (I to F) converter in item 1 below is a reversal of the response previously provided in TVA to NRC letter dated October 29, 2010 (Reference 22). General Atomics Electronic Systems Inc. (GA-ESI) notified TVA of this change on December 8, 2010 (Reference 20).<br><br>(1) The applicability of the qualification reports from GA-ESI e-mail dated December 10, 2010 (Reference 19) is as follows:<br><br>a. 04508905-QR "Qualification Test Report for RM-1000 Processor Module and Current-to-Frequency Converter" is applicable to the WBN Unit 2 RM-1000 and I to F converter modules.<br><br>b. 04508905-1SP "Supplement to Qualification Test Report for RM-1000 Processor Module and Current-to-Frequency Converter" is applicable to the WBN Unit 2 RM-1000 module.<br><br>c. 04508905-1SP is not applicable to the WBN Unit 2 I to F converter module.<br><br>d. 04508905-2SP "Qualification Test Report Supplement, I-F Converter Upgrades" is applicable to the WBN Unit 2 I to F converter module.<br><br>GA-ESI provided two other reports required to support qualification of the containment high range radiation monitors. The report descriptions are from GA-ESI e-mail on December 8, 2010 (Reference 20). The reports are:<br><br>e. GA-ESI report 04038903-QSR, "Qualification Summary Report for Watts Bar Nuclear Plant Unit 2 Replacement Radiation Monitors:" The report is the principle report and the starting point for all the radiation monitors provided as part of the replacement contract. The report describes each monitor; referenced to the technical manual for the physical and functional description and lists | | | Check page numbers of Appendix F (missing/duplicate pages).<br>Check applicability of Appendix C to RM1000 instead of RM2300? See items 336 and 337.<br><br>All equipment qualification reports including supplements 2SP and 3SP have been reviewed as vendor drawings for WBN-2. Please explain the reason for applicability of one report and not the other.<br><br>Further all TVA/Bechtel reviews seems to be dispositioned as Code 4, "Review not required. Work may proceed." The applicable reports should have been reviewed prior to dispositioning them. Please explain the apparent lack of review of WBN-2 applicable documents. Was appropriate review guidance used?<br><br>Further update required<br><br>Provide model number/part number for the RM-1000 and I/F converter used for WBN-2. This information is needed to verify that the model or part number used is the equipment that has been qualified for WBN-2.<br><br>Provide qualification reports 04038903-QSR and 04038903-7SP by the dues date of 1/22/11.<br><br>Submit a copy of any other relevant reviewed | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | the major components of the monitor system. Report section 3 identifies the TVA Watts Bar Unit 2 Environmental, Seismic, Electromagnetic Compatibility (EMC), and software requirements for each monitor. In section 4 a brief description of GA-ESI generic qualification programs for all radiation monitoring equipment in each of the four above areas is provided. The qualification basis for each monitor is provided in a separate supplement to the principle report and is identified in section 5.<br><br>f. GA-ESI report 04038903-7SP, "Qualification Basis for 04034101-001 (2-RE-90-271, -272, -273, & -274) [TVA Note: These are the containment post accident high range radiation monitors.]:" GA-ESI report 04038903-7SP is divided into subsections to address the Environmental, Seismic, EMC, and Software qualification basis for the High Range Area Monitors. Within each subsection, the HRAM is compared to a tested or analyzed article to demonstrate similarity and/or evaluate differences, the tests that were performed, and evaluation to demonstrate qualification. In most cases, the qualification basis references other documents. In addition to qualification, a section is provided that lists the life of those replaceable components that have life expectancy less than 40 years.<br><br>(2) This is addressed by response to RAI Question 336 in TVA to NRC letter dated November 24, 2010 (Reference 8)<br><br>(3) This is addressed by response to RAI Question 337 in TVA to NRC letter dated November 24, 2010 (Reference 8)<br><br>(4) The 04508905-3SP Qualification Test Report Supplement, RM-1000 Upgrades" is not applicable to WBN Unit 2 (Reference 19).<br><br>Please see Item 1, above, for applicability of the other reports.<br><br>(5) TVA provided the proprietary versions of the reports by letter dated March 12, 2010 (Reference 10). By letter dated July 15, 2010 (Reference 23), TVA provided the non-proprietary version of the reports and included a copy of the proprietary report which had been erroneously marked as having not been reviewed. 04508905-QR report has been reviewed by TVA. The review of the remaining reports is ongoing.<br><br>(6) See item 5.<br><br>**TVA Response to Follow-up NRC Request:**<br><br>The following documents are the qualification documents | | | versions of the qualification reports.<br><br>Submit copies of the reviewed reports for 04508905-QR, 04508905-1SP, 04508905-2SP.<br><br>Clarification of applicability of existing reports is acceptable. | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | associated with the RM-1000 radiation monitors:<br><br>Attachment 5 contains the approved proprietary version of General Atomics Electronic Systems 04508905-1SP, "Qualification Test Report Supplement, RM-1000 Upgrade."<br><br>• Attachment 6 contains the approved proprietary version of General Atomics Electronic Systems 04508905-2SP, "Qualification Test Report Supplement, I-F Converter Upgrades."<br><br>• Attachment 7 contains the approved proprietary version of General Atomics Electronic Systems 04038903-7SP, "Qualification Basis for 04034101 (2-RE-90-271, 272, 273 & 274)."<br><br>• Attachment 8 contains the proprietary version of General Atomics Electronic Systems 04038903-QSR, "Qualification Summary Report for Watts Bar Nuclear Plant Unit 2 Replacement Radiation Monitors." In order to meet the NRC submittal schedule, the engineering review of this document was limited to the RM-1000. The document has been accepted for the RM-1000 monitors. Engineering approval will not occur until full review for all covered monitors is complete.<br><br>• Attachment 23 contains the approved proprietary version of General Atomics Electronic Systems 04508905-QR, "Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter." | | | | | | |
| **319** | 7.5.2.3 | 7.5 | EICB (Singh) | TVA provided System Verification Test Results 04507007-1TR (July 1999) for Sequoyah to support test verification. However, the document states (page v) that it is not applicable for high range monitors with an action noted for fixing a problem with the high range RM-1000 monitors on page vi. TVA to respond to the following clarifications:<br><br>Has the anomaly noted on page vi been resolved for the high range monitors?<br><br>Provide the high range verification document for WBN2. | Responder: Temples<br><br>See TVA letter to the NRC dated October 21, 2010, item 26 (RAI Matrix Item 316) for non-applicability of 04507007-1TR. The recorded anomaly was later resolved through the verification of software version 1.2, reported in RM-1000 v1.2 Software Verification Report 04508006.<br><br>The high range verification documents are the Sequoyah RM-1000 v1.1 Software Verification Report 04508006 and RM-1000 v1.2 Software Verification Report 04508006. | 298. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br>-Response Acceptable<br><br>Due 10/31/10<br><br>Response acceptable. TVA to issue letter and confirm stated (future) dates | RAI No. 29<br>ML102980005<br>10/26/2010 | TVA Letter dated 10/29/10<br>Enclosure 1 Item No. 35 | |
| **320** | | | EICB (Garg) | Per Westinghouse letter WBT-D-2340, TENNESSEE VALLEY AUTHORITY WATTS BAR NUCLEAR PLANT UNIT 2 FSAR Markups Units 1 and 2 118% vs 121 % and Correction to RAI Response SNPB 4.3.2-7, (Reference 17) the 118% value should be 121%. Depending on the use in the FSAR either 118% or 121% is the correct value. As a result of the question, Westinghouse reviewed all locations where either 118% or 121% are used and the context of use and provided a FSAR markup to reflect the correct value at the specific location. These changes will be incorporated in FSAR Amendment 101 | Responder: Clark<br><br>This item is not required It was entered as a tracking commitment from the 10/5 letter to issue FSAR Amendment 101 which includes the described change. Amendment 101 will be issued no later than 10/29. | 299. Y | Closed | Closed | N/A | N/A | Duplicate of item 156 |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **321** | | | EICB (Garg) | For the purposes of measuring reactor coolant flow for Reactor Protection functions, elbow taps are used for both Unit 1 and 2. The discussion and equation are valid for establishing the nominal full power flow which is used to establish the Reactor Protection System low flow trip setpoint. However the method used to verify reactor coolant flow, as required by the Technical Specifications, is not the same. Unit 1 uses a simplified methodology based on elbow tap ΔP measurements correlated with precision calorimetric data over several cycles of operation as described in FSAR Reference 17, WCAP-16067, Rev 0, RCS Flow Measurement Using Elbow Tap Methodology at Watts Bar Unit 1. The plan is for Unit 2 to transition to this method after sufficient data is obtained. Pending this transition, 7.2.2.1.2 will be revised to read as follows:<br>"Nominal full power flow is established at the beginning of each fuel cycle by either elbow tap methodology or, performance of the RCS calorimetric flow measurement. Unit 1 utilizes elbow tap methodology Reference [17]. Unit 2 utilizes the RCS calorimetric flow measurement. The results are used to normalize the RCS flow indicators and provide a reference point for the low flow reactor trip setpoint."<br>This change will be incorporated in FSAR Amendment 101 | Responder: Clark<br>This item is not required It was entered as a tracking commitment from the 10/5 letter to issue FSAR Amendment 101 which includes the described change. Amendment 101 will be issued no later than 10/29. | 300. Y | Closed | Closed | N/A | N/A | Duplicate of OI# 157 |
| **322** | | 7.7.1.11 | EICB (Carte) | Section 7.7.1.11 will be added to FSAR Amendment 101 to provide a discussion of the Distributed Control System | Responder: Clark<br>This item is not required It was entered as a tracking commitment from the 10/5 letter to issue FSAR Amendment 101 which includes the described change. Amendment 101 will be issued no later than 10/29. | 301. Y | Closed | Closed | | | |
| **323** | | | EICB(Garg) | WCAP-13869 revision 1 was previously reviewed under WBN Unit 1 SER SSER 13 (Reference 8). Unit 2 references revision 2. An analysis of the differences and their acceptability will be submitted to the NRC by November 15, 2010 | Responder: Hilmes/Unit 1<br>Attachment 12 contains the WCAP 13869 Revision 1 to Revision 2 Change Analysis. | 2. Y | Open<br>Response is included in letter dated 10/29/10<br>The staff is confused with the response since both units have reference leg not insulated Rev 2 should apply to Unit 1 also and there should be no difference between Unit 1 and 2 | Open-TVA/Oversight<br>Due: 2/25/11<br>Steve Hilmes took action to resolve with Unit 1. | | TVA Letter dated 10/29/10 Enclosure 1 Item No. 36 | |
| **324** | | | EICB (Marcus) | Per the NRC reviewer, the BISI calculation is not required to be submitted. | | 302. Y | Closed | Closed | | | |
| **325** | | | EICB(Garg) | The Unit 2 loops in service for Unit 1 that are scheduled to be transferred to the Foxboro Spec 200 hardware will be transferred prior to Unit 2 fuel load | Responder: TVA Startup Olson | 303. Y | Closed | Closed | | | Closed to open item ? |
| 326 | | | EICB(Garg) | TVA uses double-sided methodology for as-found and as-left Reactor Trip and ESFAS instrument setpoint values. The FSAR will be revised in a future amendment to reflect this methodology | Responder: Webb<br>Attachment 3 contains the revised FSAR section 7.1.2.1.9 that will be included in FSAR Amendment 102 that reflects | 304. Y | Closed<br>Response is included in letter dated 10/29/10 | Closed<br>Due 12/17/10 | | TVA Letter dated 10/29/10 Enclosure 1 Item No. 37 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | this change. | | | Pending FSAR Amendment 102 submittal | | | |
| **327** | | | DORL (Poole) | Attachment 36 contains Foxboro proprietary drawings 08F802403-SC-2001 sheets 1 through 6. An affidavit for withholding and non-proprietary versions of the drawings will be submitted by January 31, 2011. | Responder: Webber<br><br>In accordance with correspondence from Foxboro, there is no proprietary information contained in the 08F802403-SC-2001 drawings. Based on this, no affidavit for withholding is required. Attachment 1 contains versions of the drawings with the proprietary information block removed. | 8. Y | Open<br><br>Response Included in letter dated 11/24/10 | Open-NRC Review<br><br>Due 11/24/10 | | | |
| **328** | 7.5.2.3 | 7.5 | EICB (Singh) | Provide the model number for the four containment high range area monitors, RM-1000 and identify how the software V&V and qualification documents apply to them. If there is no specific model number then how is it ensured that the correct radiation monitor is received at the site and subsequently installed? | Responder: Temples<br><br>The Containment High Range Radiation Monitors are model RM-1000. The monitors are uniquely identified by serial numbers which are assigned when the equipment is assembled. The applicability of V&V reports and quality documentation for the RM-1000 model is in accordance with manufacturer's approved 10 CFR 50 Appendix B Quality Program and the requirements of the purchase order. | 305. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br>-Response Acceptable | RAI No. 30<br>ML102980005<br>10/26/2010 | TVA Letter dated 10/29/10<br>Enclosure 1 Item No. 38 | |
| **329** | 7.6.1 | 7.6.7 | EICB (Singh) | Section 7.6.7 of the FSAR (Amendment 100) states that, "The DMIMS-DX™ audio and visual alarm capability will remain functional after an Operating Basis Earthquake (OBE). All of the DMIMS-DX™ components are qualified for structural integrity during a Safe Shutdown Earthquake (SSE) and will not mechanically impact any safety-related equipment."<br><br>TVA to clarify the seismic qualification of the loose parts monitoring system and include the appropriate information in Table 3.10 (or another suitable section) of the FSAR. | Responder: Clark<br><br>The title of FSAR Section 3.10 is Seismic Design of Category I Instrumentation and Electrical Equipment. Since the Loose Part Monitoring System is not a Category 1 system, it is not included in the scope of 3.10. FSAR Section 7.6.7, "Loose Parts Monitoring System (LPMS) System Description," identifies basic system seismic design criteria which are consistent with the requirements of TVA Design Criteria, WB-DC-30-31, Loose Parts Monitoring System. As identified in FSAR Table 7.1-1, Watts Bar Nuclear Plant NRC Regulatory Guide Conformance, the system conforms to Reg. Guide 1.133 as modified by Note 12. Reg. Guide 1.133 identifies the seismic requirements and Note 12 does not contain any exception to the Regulatory Guide seismic requirements.<br><br>The Westinghouse LPMS seismic report, EQ-QR-33-WBT, Revision 0, Seismic Evaluation of the Digital Metal Impact Monitoring System (DMIMS-DX™) for Watts Bar Unit 2, will be added as Reference 7 to FSAR section 7.6 in amendment 102. | 306. Y | Closed<br><br>Response is included in letter dated 10/29/10 | Closed<br><br>Due 12/17/10<br><br>Pending FSAR Amendment 102 submittal.<br><br>TVA to confirm that the equipment has been seismically qualified as required and that TVA reviewed and found the report acceptable.<br><br>TVA response does not list the seismic test document and its acceptance by TVA. FSAR should reference the test document as the source document for tracking conformance. | RAI No. 1<br>ML102980005<br>10/26/2010 | TVA Letter dated 10/29/10<br>Enclosure 1 Item No. 39 and FSAR Amendment 102. | |
| **330** | 7.3 | 7.3 | EICB (Darbali) | Related to Item 298<br><br>IE Bulletin 80-06 calls for review of engineered safety features with the objective of ensuring that no device will change position solely because of the 'reset' action.<br><br>In Supplement 3 of NUREG-0847, section 7.3.5, the staff approved the design modifications proposed by the applicant that would allow certain devices to remain unchanged upon an ESF reset. **The staff also found acceptable the applicant's justification for some safety-related equipment that does not remain in its emergency mode after an ESF reset.** | Responder: Hilmes/Faulkner<br><br>The original response to IE Bulletin 80-06 for both WBN Unit 1 and 2 was provided on TVA letter to NRC dated March 11, 1982 (ML073530129) (Reference 4). Subsequent design changes have impacted the original response such that some equipment that originally changed state no longer does so and some equipment has been deleted. There are no additions to the list originally provided in TVA letter to NRC dated March 11, 1982 (ML073530129) (Reference 4). The following is the current list of equipment that does not remain in its emergency mode after an ESF reset: | 307. Y | Closed | Closed | EICB RAI No.20<br>ML102910017,<br>10/19/10 | Item 7, TVA letter dated November 24, 2010 | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Please list for Unit 1 and Unit 2 the safety-related equipment that does not remain in its emergency mode after an ESF reset.** | 1. Unit 1 and 2 Equipment (prefix 1- (Unit 1) or 2- (Unit 2)<br><br>a. Auxiliary Feedwater Pump Turbine Speed Control Valve, FCV-1-52<br><br>b. Auxiliary Feedwater (AFW) Level Control Valves as listed below:<br><br>i. LCV-3-172 - SG3 - Level Control Valve<br>ii. LCV-3-173 - SG2 - Level Control Valve<br>iii. LCV-3-174 - SG1 - Level Control Valve<br>iv. LCV-3-175 - SG4 - Level Control Valve<br>v. LIC-3-172 - SG3 - Level Indicating Controller<br>vi. LIC-3-173 - SG2 - Level Indicating Controller<br>vii. LIC-3-174 - SG1 - Level Indicating Controller<br>viii. LIC-3-175 - SG4 - Level Indicating Controller<br>ix. LCV-3-148 - SG3 - Level Valve<br>x. LCV-3-156 - SG2 - Level Valve<br>xi. LCV-3-164 - SG1 - Level Valve<br>xii. LCV-3-171 - SG4 - Level Valve<br>xiii. LCV-3-148A - SG3 - Level Bypass Control Valve<br>xiv. LCV-3-156A - SG2 - Level Bypass Control Valve<br>xv. LCV-3-164A - SG1 - Level Bypass Control Valve<br>xvi. LCV-3-171A - SG4 - Level Bypass Control Valve<br>xvii. LIC-3-148 - SG3 - Controller<br>xviii. LIC-3-156 - SG2 - Controller<br>xix. LIC-3-164 - SG1 - Controller<br>xx. LIC-3-171 - SG4 - Controller<br><br>c. Lower and Upper Compartment Cooler Fans and Control Rod Drive Mechanism Cooler Fan<br><br>d. Penetration Room Cooler Fans Elevations 737, 692 and 713<br><br>e. Pipe Chase Cooler Fans<br><br>2. Common Equipment<br><br>a. Shutdown Board Room A Pressurizing Fans<br><br>b. Control Building Ventilation Dampers as listed below:<br><br>i. 0-FCO-31-9 - Spreading Room Supply Fan Damper<br>ii. 0-FCO-31-10 - Spreading Room Supply Fan Damper<br>iii. 0-FCO-31-16 - Toilet a Locker Room Exhaust Fan Exhaust Damper<br>iv. 0-FCO-31-17 - Toilet a Locker Room | | | | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Exhaust Fan Exhaust Damper<br>v. 0-FCO-31-3 - Main Control Room Isolation Damper<br>vi. 0-FCO-31-4 - Main Control Room Isolation Damper<br>vii. 0-FCO-31-36 - Spreading Room Fresh Air Supply Damper<br>viii. 0-FCO-31-37 - Spreading Room Fresh Air Supply Damper<br><br>c. Cask Loading Exhaust Dampers as listed<br><br>i. 0-FCO-30-122 - Cask Loading Area Exhaust Damper<br>ii. 0-FCO-30-123 -Cask Loading Area Exhaust Damper<br><br>d. Auxiliary Building General Supply Exhaust Fans Elevation 737<br><br>e. CCW and AFT Pump Space Cooler Fans<br><br>f. Spent Fuel Pit Pumps Space Coolers<br><br>g. EGTS Room Coolers<br><br>h. Turbine Driven AFW and Boric Acid Space Coolers | | | | | | |
| **331** | 7.6.1 | 7.6.7 | EICB (Singh) | As a follow up of OI 190, Staff has reviewed the proprietary version of the DMIMS-DX system description to verify the conformance claims in the FSAR. Staff has noted the following insufficiencies and discrepancies between the FSAR and the proprietary version of the system description for loose parts monitoring system provided by TVA.<br><br>1) FSAR, Amendment 100, page 7.6-5 states, "During baseline testing, the reactor vessel and steam generator are impacted three feet from each sensor with a force of 0.5 ft-lb. Loose parts detection is accomplished at a frequency of 1 kHz to 20 kHz, where background signals from the RCS are acceptable. Spurious alarming from control rod stepping is prevented by a module that detects CRDM motion commands and automatically inhibits alarms during control rod stepping.<br><br>The online sensitivity of the DMIMS-DX™ is such that the system will detect a loose part that weighs from 0.25 to 30 lb and impacts with a kinetic energy of 0.5 ft-lb on the inside surface of the RCS pressure boundary within 3 ft of a sensor."<br><br>The source of this information is not cited nor is it described in the system description. TVA to provide the source of the information and update the system description as needed.<br><br>2) Regulatory Guide (RG) 1.133, rev.1, regulatory position C.1.g states that, "*Operability for Seismic and Environmental Conditions.* Components of the loose-part detection system within containment should be designed and installed to perform their function following all seismic events that do not | Responder: WEC/Harless/Clark<br><br>**TVA Partial Response:**<br><br>1) The source of the information is the DMIMS-DXTM Operations and Maintenance Manual, TS3176, Revision 0, dated August 2010. Attachment 14 contains the revised system description, "Westinghouse DIMMS-DX™ Loose Part Detection System Description," Revision 1. The Westinghouse DIMMS-DX™ Loose Part Detection System Description," Revision 1 will be added as Reference 9 to section 7.6 in FSAR Amendment 102.<br><br>2) The source of the information is the DMIMS-DXTM seismic qualification report, Westinghouse report EQ-QR-33-WBT, Revision 0, Seismic Evaluation of the Digital Metal Impact Monitoring System (DMIMS-DXTM) for Watts Bar Unit 2. Attachment 14 contains the revised system description, "Westinghouse DIMMS-DXTM Loose Part Detection System Description," Revision 1.<br><br>3) The entries for the following items in FSAR Section 7.6.7 will be modified in Amendment 102 as shown in Attachment 3 for draft revision to WBN Unit 2 FSAR Section 7.6.7, "Loose Part Monitoring System (LPMS) System Description."<br><br>Sensors **(In Containment)** | 308. Y | Closed<br><br>Response included in letter dated 12/22/10 | Closed<br><br>TVA letter 12/22/10, Encl 1, Item 27.<br><br>Due 12/22/10<br><br>Pending FSAR Amendment 102 submittal<br><br>TVA to reference the DMIMS-DXTM Operations Manual in the FSAR as the source document<br><br>TVA to reference the source document for item# 4 per the response. | RAI No. 8<br>ML102980005<br>10/26/2010 | TVA Letter dated 10/29/10<br>Enclosure 1 Item No. 40 | Follow-up of OI-190. |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | require plant shutdown, i.e., up to and including the Operating Basis Earthquake (OBE). Recording equipment need not function without maintenance following the specified seismic event provided the audio or visual alarm capability remains functional. The system should also be shown to be adequate by analysis, test, or combined analysis and test for the normal operating radiation, vibration, temperature, and humidity environment.<br><br>FSAR, Amendment 100, page 7.6-5 states, "The DMIMS-DX™ audio and visual alarm capability will remain functional after an Operating Basis Earthquake (OBE). All of the DMIMS-DX™ components are qualified for structural integrity during a Safe Shutdown Earthquake (SSE) and will not mechanically impact any safety-related equipment." Paragraphs 4.c and 4.d of the system description are not consistent with the seismic qualifications described in the FSAR. TVA to provide the source of the information contained in the FSAR and update the system description as needed.<br><br>3) The system description clearly describes the "In-containment equipment" and "DIMMS-DX Cabinet equipment. The FSAR should be updated to reflect the equipment locations for clarification purposes.<br><br>4) The information regarding frequency ranges of the sensors is included on page 7.6-6 of Amendment 100 of the FSAR but the system description does not contain this information. Please provide the source of this information and update the system description to reflect the appropriate information.<br><br>5) Please provide information as to how the in-containment components are qualified for vibration as addressed in regulatory position C.1.g of RG 1.133. | Softline Cable **(In Containment)**<br>Preamplifier **(In Containment)**<br><br>Attachment 3 contains the FSAR Amendment 102 Change Markups that reflect these changes.<br><br>4) The source of the information is Westinghouse Letter WBT-D-2580, Tennessee Valley Authority Watts Bar Nuclear Plant Unit 2 Response to NRC RAIs on LPMS (Reference 5). Attachment 14 contains "Westinghouse DIMMS-DXTM Loose Part Detection System Description," Revision 1.<br><br>In responding to Item 4, conflicting information was found between the Westinghouse-prepared FSAR section and various Westinghouse technical documents. To fully respond to this item, a change to the FSAR is required to change the minimum flat sensor frequency response from 5 Hz to 10 Hz. Attachment 3 contains the FSAR Amendment 102 Change Markups that reflect the revised frequency response of the sensor.<br><br>Westinghouse document 1TS3182, Revision 0, Watts Bar Unit 2 DMIMS-DXTM System Validation Data Package, dated July 2010 has been added as reference 8 to FSAR Section 7.6 in amendment 102. Per Westinghouse letter WBT-D-2580, this document will be revised to reflect the 10Hz minimum frequency and provide the basis for the frequency response values in the FSAR.<br><br>5) In-containment component qualification for vibration as addressed in regulatory position C.1.g of RG 1.133, will be addressed in a future RAI response letter.<br><br>**TVA Partial Response:**<br><br>Items 1) through 4) were addressed in the partial response provided in TVA to NRC letter dated October 29, 2010. Item 5 is addressed as follows:<br><br>TVA has reviewed the information provided by Westinghouse describing how the Loose Part Monitoring System (LPMS) sensor is qualified for normal operating conditions provided in Westinghouse letter WBT-D-2782, dated December 17, 2010 (Reference 11) as addressed in regulatory position C.1.g of Reg. Guide 1.133 and found it acceptable. Vibration qualification is not applicable to the softline cable. Due to the installation location (junction boxes mounted to the shield or fan room walls) and previous seismic qualification, vibration qualification of the charge converter/preamplifier is not required. This completes the response to this item. | | | | | | |
| **332** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 10/26/2010<br><br>Related to 302 | TVA included DCN 52389 in the 10/29/10 letter. | 309. Y | Closed<br><br>Response is acceptable | Closed<br><br>NRC to issue formal RAI to TVA | ML103000105 Item No. 1 | TBD | EICB RAI ML103000105 sent to DORL |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In response to Open Item 302 TVA provided a diskette that included a draft of Attachment 8 to the proposed 10/29/2010 letter. Attachment 8 included 14 of the 15, 50.59 documents listed in the, "RG 1.97 50.59 Listing." DCN 52389 was not included on the diskette. Identify the document and date that officially transmitted or will transmit, DCN 52389 to the NRC. If DCN 52389 has not been previously transmitted to NRC please transmit the document to the NRC. | This item was corrected prior to transmittal of the response to OI 302 in the 10/29/10 TVA letter. | | Response is included in TVA letter dated 10/29/10 | TVA to provide formal response to RAI | | | |
| **333** | 7.5.2.1 | 7.5.1 | EICB (Marcus) | 10/27/2010<br><br>Related to 44 and 303<br><br>In response to Open Item 303, TVA provided a diskette that included a draft of Attachment 9 to the proposed October 29, 2010 letter. In Attachment 9, the Unit 2 variable source for RG 1.97 variable 37, "CCS Sample Tank Level," was listed as Foxboro Spec 200. However, in response to Open Item 44, in Enclosure 1 to TVA letter dated June 18, 2010 (ML101940236), the Unit 2 variable source for RG 1.97 variable 37 was listed as Foxboro I/A. Determine which is correct and formally issue a correction. | TVA included the correct information in the 10/29/10 letter.<br><br>This item was corrected prior to transmittal of the response to OI 303 in the 10/29/10 TVA letter. | 310. Y | Closed<br><br>Response is acceptable<br><br>Response is included in TVA letter dated 10/29/10 | Closed<br><br>NRC to use formal RAI to TVA<br><br>TVA to provide formal response to RAI | ML103000105 Item No. 2 | TBD | EICB RAI ML103000105 sent to DORL |
| **334** | 7 | 7 | EICB (Darbali) | FSAR Figure 7A-3 "Mechanical Flow and Control Diagram Symbols" doesn't show the symbols for the first column of valves. Please correct this in a future FSAR amendment.<br><br>Update:<br>Please fix symbols for Gate Valve, Globe Valve and Float operated valve. | Responder: Stockton | 1. Y | Open<br><br>Figure will be corrected in FSAR Amendment 103. | Open-TVA/Licensing | RAI not required. | N/A | RAI not required because the figure is not part of any SE section. |
| **335** | 7.6.1 | 7.6.7 | EICB (Singh) | LPMS: Reference to OI-331, sub item 2.<br><br>Provide analysis, test, or combined analysis and test for normal operating radiation, temperature, and humidity environment per regulatory position C.1.g of RG 1.133. As an alternate TVA may confirm that the required equipment has been qualified for the environments stated in RG 1.133, position C.1.g and that TVA has reviewed the test report and found it acceptable. | Responder: WEC<br><br>TVA has reviewed the information provided by Westinghouse describing how the Loose Part Monitoring System (LPMS) sensor is qualified for normal operating conditions provided in Westinghouse letter WBT-D-2782, dated December 17, 2010 (Reference 11) as addressed in regulatory position C.1.g of Reg. Guide 1.133 and found it acceptable. The qualification information on the softline cable and charge converter/preamplifier is being assembled and will be submitted by March 11, 2011. | 20. Y | Open<br><br>**Partial** Response included in letter dated 12/22/10 | Open-TVA/WEC<br><br>Submit qual report by 3/11/11 as stated in TVA letter of 12/22/10, Encl 1, Item 28.<br><br>Due 12/22/10 | | | |
| **336** | 7.5.2.3 | 7.5 | EICB (Singh) | Re: RM-1000 Report 04508905-QR<br><br>Please check the page numbering in Appendix F, Closed Nonconforming Material Reports. Pages 1 and 6 are missing and page 2 is included multiple times. Also identify which page number is the last page number. | Responder: GA<br><br>General Atomics was not able to determine where the duplicate page 2 originated. The master document does not contain any duplicate pages. Due a clerical error during document development, the master document starts at page 2 and ends at page 9, for a total of 8 pages. In May of this year, the NRC discovered that the master document was missing page 6. The master document was revised and re-submitted. Attachment 2 contains the missing page 6.<br><br>The Nonconforming Material (NCM) reports found on Appendix F are complete. | 311. Y | Closed<br><br>Response Included in letter dated 11/24/10 | Closed<br><br>Response acceptable. Please submit response. | | | |
| **337** | 7.5.2.3 | 7.5 | EICB (Singh) | Re: RM-1000 Report 04508905-QR<br><br>Appendix C is titled as Seismic Test Fixture for RM2300, See Drawing 04619028. Please verify whether or not it applies to RM-1000? If applicable, then please identify how it is applicable. | Responder: GA<br><br>The test fixture listed on Appendix C is applicable to the RM-1000, as indicated in the second and third paragraph of section 4.3.1, of the 04508905-QR report. The RM-1000's | 312. Y | Closed<br><br>Response Included in letter dated 11/24/10 | Closed<br><br>Response acceptable. Please submit response. | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | and the I/F converters are mounted on a standard 19 inch NIM-Bin, and this test rack is configured to simulate the field installation of a standard 19 inch rack.<br><br>This seismic test fixture was originally built for the seismic testing of the RM2300's which are also mounted on a standard 19 in NIM-Bin." | | | | | | |
| **338** | 7.5.2.3 | 7.5 | EICB (Singh) | In page 3-15 and appendix B of Qualification Test Report 04508905-QR, licensee described the selection of seismic required response spectra (RRS) and indicated Figure 3-2 (page 3-17), Figure 3-3 (page 3-18) are the RRSs used. The RRS curves used for actual testing are lower than the RRS curves that are shown on Figures 3-2 and 3-3. The RRS curves used for testing are shown in Figure 4-5, 4-6, 4-7, 4-8, 4-11, 4-12, 4-13, and 4-14 (pages 4-25, 4-26, 4-28, 4-29, 4-37, 4-38, 4-40, 4-41). Please clarify and justify why the RRS curves used in actual tests are lower than the RRS curves determined in Figures 3-2 and 3-3.<br><br>In addition please justify that the RRS used for testing envelopes the RRS required for WBN-2 application specific seismic conditions. | WBN Unit 2 specific seismic qualification of the RM-1000 radiaiton monitors is addressed in 04038903-7SP, "Qualification Basis for 04034101 (2-RE-90-271, 272, 273 & 274)" (Attacment 7) and 04038903-QSR, "Qualification Summary Report for Watts Bar Nuclear Plant Unit 2 Replacement Radiation Monitors" (Attachment 8). | 3. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11 | | | |
| **339** | 7.5.2.3 | 7.5 | EICB (Singh) | In the Qualification Test Report 04508905-QR, the licensee provided only eight Safe Shutdown Earthquake (SSE) Test Response Spectra (TRS) as mentioned in the previous open item (OI-338). Please provide all SSE and Operating Basis Earthquake (OBE) TRS plots for NRC review. | Attachment 1 contains the applicable ARS plots for Elevation 755. Attachment 2 contains the applicable Wyle Test Report 41991 SSE TRS plots. | 4. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11 | | | |
| **340** | 7.5.2.3 | 7.5 | EICB (Singh) | Provide test result curves for all EMI/RFI tests listed in Table 3.2.3 (page 3-8) of the Qualification Test Report 04508905-QR. In addition, please provide the standards or the guidance documents used as the source for ENV 50140, ENV 55011 Class A, and EN 55022 Class B. | Responder: GA<br><br>The following responses are based on e-mail: GA-ESI to Bechtel, dated December 8, 2010 (Reference 20),<br><br>**(1)** The EMI/RFI tests described in Table 3-2 are based on GA-ESI report 04509050 and are summarized in GA-ESI report 04508905-QR. The independent laboratory report, with curves, is part of GA-ESI report 04509050. Subsequent to issuing GA-ESI report 04508905-QR additional EMC testing was performed in accordance with TVA specific requirements. The results of the subsequent EMC testing are reported in GA-ESI report 04038800. GA-ESI report 04038800 includes the test curves and the report is used as the basis for EMC qualification of the Upper and Lower Inside Containment Post Accident Radiation Monitors (2-RE-90-271 through -274). The results of the testing and the acceptability of the RM-1000 monitors for use at WBN Unit 2 are addressed in GA-ESI report 04038903-7SP. This report will be submitted no later than January 28, 2010.<br><br>**(2)** ENV 50140, EN 55011, and EN 55022 are British Standard Institution (BSI) publications concerning equipment electromagnetic and radio frequency performance. The standard titles are shown below:<br>a. ENV 50140 - Electromagnetic Compatibility - Basic Immunity Standard - Radiated Radio-Frequency Electromagnetic Field - Immunity Test<br>b. EN 55011 - Industrial, scientific and medical | 5. Y | Open<br><br>Response included in letter dated 12/22/10. | Open-TVA/Bechtel<br><br>Provide the qual reports by 1/28/11 per TVA letter of 12/22/10.<br><br>Due: 2/25/11 | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement<br>c. EN 55022 - Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement<br><br>**TVA Response to Follow-up NRC Request:**<br><br>Attachment 5 contains the proprietary version of General Atomics Electronic Systems 04508905-1SP, "Qualification Test Report Supplement, RM-1000 Upgrade." Attachment 6 contains the proprietary version of General Atomics Electronic Systems 04508905-2SP, "Qualification Test Report Supplement, I-F Converter Upgrades." Attachment 7 contains the proprietary version of General Atomics Electronic Systems 04038903-7SP, "Qualification Basis for 04034101 (2-RE-90-271, 272, 273 & 274)." Attachment 8 contains the proprietary version of General Atomics Electronic Systems 04038903-QSR, "Qualification Summary Report for Watts Bar Nuclear Plant Unit 2 Replacement Radiation Monitors." Attachment 23 contains the proprietary version of General Atomics Electronic Systems 04508905-QR, "Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter." | | | | | | |
| **341** | 7.5.2.3 | 7.5 | EICB (Singh) | FSAR Tables 3.10 list seismically qualified equipment. However, these tables do not list the containment high range radiation monitors. Please add them to the appropriate FSAR table(s) or justify why they should not be included in the FSAR 3.10 series of tables. | A review of WBN Unit 2 FSAR amendment 102 chapters 3.10, 11 and 12 was performed. The reviewer was unable to locate seismic qualification information for the radiation monitoring system in those chapters. A review of chapter 3.11 confirmed that radiation monitoring is included in the environmentally qualified systems.<br><br>It appears that seismic qualification of the radiation monitoring equipment was unintentionally omitted from FSAR chapter 3.10. FSAR chapter 3.10 will be updated to include the qualified radiation monitoring equipment in FSAR amendment 103. | 6. Y | Open | Open-TVA/Bechtel<br><br>Will be closed on update of FSAR 3.10 series tables. | | | |
| **342** | 7.5.2.3 | 7.5 | EICB (Singh) | Please confirm that RM-1000 monitors and the associated equipment is supplied power from redundant battery backed class 1E power sources. | The RM-1000 containment high range radiation monitors are powered from 2-RM-90-271 & 2-RM-90-273 – Vital Power Board 2-III Breaker 45 Train A and 2-RM-90-272 & 2-RM-90-274 – Vital Power Board 2-IV Breaker 47 Train B. The vital power boards are battery backed. | 313. Y | Closed | Closed<br><br>See TVA letter 12/22/10, encl 1, item 31. | | | |
| **343** | 7.5.2.3 | 7.5 | EICB (Singh) | Seismic RRS in the 04508905-QR report Figures 3-2 and 3-3 show Required Response Spectra (RRS) to be greater than 20 g's. The Test Response Spectra (TRS) in Figures 4-11 and 4-12 appears to be limited to about 15 g maximum. Please explain this apparent lack of consistency between the RRS and the TRS. Will this document be revised to take care of this inconsistency? | (1) The cause of the difference between the RRS and TRS was a test equipment failure at the test facility. When the test equipment failed, the facility was unable to use the table capable of 20gs. Rather than delay testing for six months, the facility proposed and GA-ESI agreed to use a smaller table with a lower capability. The justification was that the resulting TRS would still envelope the majority of US nuclear plants RRS.<br><br>(2) To TVA's knowledge GA-ESI does not plan to revise this report. This is a baseline report that is used as a basis for producing individual plant specific reports. | 314. Y | Closed | Closed<br><br>See TVA letter 12/22/10, encl 1, item 32. | | | |
| **344** | 7.6.6 | ? | EICB (Singh) | Unit 1 SE discussed in Section 7.6.5, "Valve Power Lockout". There is no section in FSAR which provides discussion on this | In accordance with OPDP-6, "Locked Valve/Breaker Program," Revision 1, valves locked by design are shown on | 7. N | Open | Open-TVA/Bechtel | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | subject. SE section discusses compliance with PSB-18. Provide a discussion which can be used by the staff to determine similar conclusion as Unit 1 and if the design is similar to Unit 1 then make a statement to that effect. Also provide the list of the valves where power lockout during normal reactor operation is utilized for valves whose inadvertent operation could affect plant safety. | design output documents (flow diagrams, system descriptions etc.). The list of valves locked by design is contained in 0-PI-OPS-17.0, "18 Month Locked Valve Verification," Revision 44 (Attachment 22). | | ICSB-18 provides guidance on application of the single failure criterion to manually controlled electrically operated valves.. According to this BTP, electrically operated valves includes MOV, SOV and those valves operated indirectly by an electrical device, e.g.an air operatd valves whose air supply is controlled by an electrical solenoid valves. FSAR Section 7.6.6 addresses only MOVs. If TVA has done an analysis to demonstrate compliance with the guidance of this BTP for Unit 1 and this analysis does not change for Unit 2 for other valves than TVA shouls make a statement to that effect. If there are changes to the analysis then justify those changes based on this BTP. | | | | |
| **345** | 7.5.2.3 | 7.5 | EICB (Singh) | Provide the normal temperatures and expected periods of high/low temperature excursions to assess aging requirements. TVA to further clarify if 86ºF for 40 years was used as the qualification requirement for aging tests. This has been stated in some of the subsections under section 4.2 of the 04508905-QR report but the rationale for using 86ºF (includes an internal temperature rise of 18ºF) for 40 years has not been justified in the 04508905-QR report or the supplement reports. TVA to provide the rationale for this acceptance criteria for WBN-2. | RM-1000 in a NIM Bin was Tested at 39°F for 72 Hrs and Tested at 131°F for 72 Hrs per Section 4.2.6 of 04508905-QR. This is stated in document 04038903-7SP, Section 2.1. The ambient temperature used for aging was 86°F(30°C). The NIM Bin has perforated holes in top and bottom covers and has an average internal temperature rise of approximately 18 °F due to natural air convection. So the average internal temperature used for aging was 104°F (40°C)<br><br>In accordance with Attachment 8, 04038903-QSR, "Qualification Summary Report for Watts Bar Nuclear Plant Unit 2 Replacement Radiation Monitors" Section 3.2, the aging is to an ambient equivalent condition of 104°F which is based on an 86°F average ambient temperature of the environment and an enclosure temperature rise of 18°F. IEEE Std 1205-2000, Table D.8 shows that the upper bounding temperature is 104°F for all plant areas except the reactor building. The intent in qualifying the part for 40 years is to identify each component's failure mechanisms and to determine whether 40 years[1] of aging has a significant effect of these failure mechanisms.<br><br>[1]The design life goal for most Class 1E equipment is 40 years, but for most electronic assemblies 20 years, or less, is more realistic. Because of rapidly changing technologies, replacement components sometimes become unavailable in a relatively short period of time. | 8. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11 | | | |
| **346** | 7.5.2.3 | 7.5 | EICB (Singh) | TVA has previously stated in response to open item 319 that RM-1000 System Verification Test Results report, 04507007-1TR is not applicable to WBN-2. However, TVA has not provided a WBN-2 specific test results report. Please identify and provide the appropriate test results reports to complete the review. | Document 04507007-1TR is the RM-1000 System Verification Test Results. 04038903-QSR, "Qualification Summary Report for Watts Bar Nuclear Plant Unit 2 Replacement Radiation Monitors" (Attachment 8) and and 04038903-7SP, "Qualification Basis for 04034101 (2-RE-90-271, 272, 273 & 274) (Attachment 7) are the Watts Bar Unit 2 equipment specific qualification reports. | 9. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11<br><br>The proposed response appears to be conflicting with the | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | proposed response for OI-351 regarding not submitting the 04508905-QR report. TVA to re-assess proposed response for both OIs. | | | |
| **347** | 7.5.2.3 | 7.5 | EICB (Singh) | Qualification report 04508905-1SP does not address EMI/RFI qualification for the new RM-1000 modules. TVA to provide the updated qualification or explain the basis for not addressing the EMI/RFI qualification. | Qualification report 04038903-7SP, Qualification Basis for 04034101-001 (2-RE-90-271, -272, -273, & -274) (Attachment 7), addresses the EMI/RFI qualifications for the entire loop including the RM-1000 and current to frequency (I/F) converter. This report references 04038800, RM-1000 EMC Test Report, TVA, and the results are summarized in 04038903-7SP. | 10. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11 | | | |
| **348** | 7.5.2.3 | 7.5 | EICB (Singh) | Qualification report 04508905-2SP does not address EMI/RFI qualification for the new I/F converters. TVA to provide the updated qualification or explain the basis for not addressing the EMI/RFI qualification. | Qualification report 04038903-7SP, Qualification Basis for 04034101-001 (2-RE-90-271, -272, -273, & -274), (Attachment 7) addresses the EMI/RFI qualifications for the entire loop including the RM-1000 & I/F converter. This report references 04038800, RM-1000 EMC Test Report, TVA, and the results are summarized in 04038903-7SP. | 11. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11 | | | |
| **349** | 7.5.2.3 | 7.5 | EICB (Singh) | Radiation testing was not considered in any of the test reports as all the equipment has been assumed to be located in nuclear power plant areas with mild environments and radiation dosages less than 1 x $10^3$ rads for total integrated dose (TID). However, the radiation monitors and the I/F converters are located in the main control room which is defined as mild environment. For WBN-2 mild environment is defined as room or building zone where (1) the temperature, pressure, or relative humidity resulting from the direct effects of a design basis event (DBE) (e.g., temperature rise due to steam release) are no more severe than those which would occur during an abnormal plant operational condition, (2) the temperature will not exceed 130ºF due to indirect effects of a DBE, (3) the event radiation dose is less than or equal to 1 x $10^4$ rads, and (4) the total event plus the 40 year TID (total integrated dose) is less than or equal to 5 x $10^4$ rads (reference WB-DC-40-54). TVA to address lack of radiation qualification for WBN-2. | The design criteria provides the criteria for determing what is a mild environment at WBN Unit 2. Calculation WBNAPS4004 "Summary of Mild Environment Conditions for Watts Bar Nuclear Plant" provides the actual values for each area of the plant. In accordance with Table 1, the Control Room has a 40 year maximum TID of 3.5x$10^2$ RAD and a maximum integrated accident dose of 7.1x$10^2$ RAD for a maximum TID of 1.06x$10^3$ RAD. The 60 RAD difference is not considered significant and radiation qualification was not deemed necessary. | 12. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11<br><br>TVA to provide the assessment document or a suumary of the document with the reference to the appropriate document/documents. | | | |
| **350** | 7.5.2.3 | 7.5 | EICB (Singh) | The seismic required response spectra (RRS) is shown in Figures 3-1 of 04508905-1SP and Figure 3-1 of 0458905-2SP report. The actual test response spectra are shown in Figures 4-5 and 4-6 of 04508905-QR report. The actual test response spectra does not seem to fully envelope the RRS. However, this statement is based on visual reading of unidentified numbers. TVA to provide clarification to the values at the inflection point of all lines on the RRS and the actual test response spectra. The seismic qualification issue is open till further clarification is received from TVA. | RM-1000 in a NIM Bin was Seismically Tested and the actual test response spectra fully envelopes the RRS of CEB-SS-5.10 Rev. 3, Figure 3-1 as shown in Section 3.0, Figures 3-4 and 3-5 of 04038903-7SP, "Qualification Basis for 04034101 (2-RE-90-271, 272, 273 & 274) (Attachment 7). Seismic qualification of the WBN Unit 2 RM-1000 monitors is summarized in 04038903-QSR, "Qualification Summary Report for Watts Bar Nuclear Plant Unit 2 Replacement Radiation Monitors" (Attachment 8). | 13. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11 | | | |
| **351** | 7.5.2.3 | 7.5 | EICB (Singh) | The replacement schedule for the components that have a qualified life of less than 40 years is noted in Table 6-1 of the supplemental qualification report 04508905-1SP. It is not clear if the components identified for replacement in this report are the only components or if the components which are in addition to the components previously identified in qualification report 04508905-QR.<br><br>Are there any age sensitive components for the I/F converter used | The replacement schedules stated in 04508905-1SP, "Qualification Test Report Supplement, RM-1000 Upgrade" (Attachment 5) and 04508905-2SP, "Qualification Test Report Supplement, I-F Converter Upgrades" (Attachment 6) should be used. 04508905-2SP states in Section 6: " None of the Current-to-Frequency converter modules qualified by this supplement contain parts that have significant age related failure mechanisms." | 14. N | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11<br><br>Reports 04508905-1SP and -2SP both refer to 04508905-QR as the parent document in section 4.1. Also see | | | |

| No. | SE Sec. | FSAR Sec. | NRC POC | Issue | TVA Response(s) | Response Acceptable Y/N | Status/ Current Actions | Resolution Path | RAI No. & Date | RAI Resp. Date | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | for WBN-2? (Note: Report 04508905-2SP does not state any age sensitive components that require replacement during the qualified life). | | | | staff comment on OI-346. | | | |
| **352** | 7.5.2.3 | 7.5 | EICB (Singh) | Please calrify how many RM-1000 radaition monitors are being procured for WBN-2, is the quantity 2 or four. MR 25402-011-MRA-HARA-00002, R4 under Item 1.6 indicates that the quantity is 2. If so, is WBN-2 using dual channel indication on each RM-1000 unit. TVA to clarify. | The total number of RM-1000 units procured under MR 25402-011-MRA-HARA-00002 is four. The MR on line item 1.6 is stating the purchase of 2 sets of 2 RM-1000s & I/F Converters making a total of 4 for each type of component.<br><br>Each monitor utilizes a single channel display for the 2-RM-90-271 – 274 monitors. | 15. Y | Open | Open-TVA/Bechtel<br><br>Due: 2/25/11<br><br>Will close on receipt of formal response. | | | |