WBN2Public Resource

From: Poole, Justin
Sent: Monday, May 23, 2011 4:38 PM
To: Rahn, David; Alvarado, Rossnyev; Darbali, Samir; Carte, Norbert; Singh, Gursharan
Cc: WBN2HearingFile Resource
Subject: FW: 20110506 Open Item List Master TVA Update 05-23-11.docx
Attachments: 20110506 Open Item List Master TVA Update 05-23-11.docx

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From: Clark, Mark Steven [mailto:msclark0@tva.gov]
Sent: Monday, May 23, 2011 4:10 PM
To: Crouch, William D; Hilmes, Steven A; Knuettel, Edward Terry
Cc: Poole, Justin; Smith, James D
Subject: 20110506 Open Item List Master TVA Update 05-23-11.docx

Bill:

Updated matrix for transmittal to the NRC for the Thursday phone call.

Regards,

Steve

Steve Clark
Bechtel Power Corp.
Control Systems
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Hearing Identifier: Watts_Bar_2_Operating_LA_Public
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Subject: FW: 20110506 Open Item List Master TVA Update 05-23-11.docx
Sent Date: 5/23/2011 4:37:59 PM
Received Date: 5/23/2011 4:38:03 PM
From: Poole, Justin

Created By: Justin.Poole@nrc.gov

Recipients:
"WBN2HearingFile Resource" <WBN2HearingFile.Resource@nrc.gov>
Tracking Status: None
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MESSAGE	728	5/23/2011 4:38:03 PM
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Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
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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.					
						2.					
						3.					
001	All	All	[illegible]	The Watts Bar Nuclear Plant FSAR red-line for Unit 2 (Agency	12/15/2009 Presentation Slides	1. Y	Closed	Closed	EICB RAI	3/12/2010	**NNC 11/19/09:** The FSAR contains
002	All	All	[illegible]	Are there I&C components and systems that have changed to a	12/15/2009 Presentation Slides	2. Y	Closed	Closed	EICB RAI	3/12/2010	**NNC 11/19/09:** The FSAR contains
003	All	All	[illegible]	Because a digital I&C platform can be configured and programmed	12/15/2009 Presentation Slides	3. Y	Closed	Closed	EICB RAI	3/12/2010	**NNC 11/19/09:** The FSAR contains
004	All	All	[illegible]	Please identify the information that will be submitted for each	Responder: Webb 1/13/10 Public Meeting	4. Y	Closed	Closed	EICB RAI	January 13, 2010	**NNC 11/19/09:** LIC-110 Rev. 1 Section
005	7.1.3.		[illegible]	By letter date February 28, 2008 (Agencywide Documents Access	Responder: Craig/Webb	5. Y	Closed	Closed	EICB RAI	TVA Letter dated	
006			[illegible]	Amendment 95 of the FSAR, Chapter 7.3, shows that change 7.3-1	By letter dated February 5, 2010: TVA provided the Unit 2	6. Y	Closed	Closed	EICB RAI	TVA Letter dated	**NNC:** WCAP-12096 Rev. 7
007	7.1.3.		[illegible]	The setpoint methodology has been reviewed and approved by the	TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 7	7. Y	Closed	Closed	EICB RAI	TVA Letter dated	TVA to provide Rev. 8 of the Unit 1
008	7.3		[illegible]	There are several staff positions that provide guidance on setpoint	TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 8	8. Y	Closed	Closed	EICB RAI	TVA Letter dated	
009	7.3.2	5.6,	[illegible]	Change 7.3-2, identified in Watts Bar Nuclear Plant FSAR red-line	TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 9	9. Y	Closed	Closed	EICB RAI	3/12/10,	
010	7.3	7.3	[illegible]	The original SER on Watts Bar (NUREG-0847) documents that the	TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 10	10. Y	Closed	Closed	EICB RAI	3/12/10,	
011	7.3.2	5.6,	[illegible]	NUREG-0847 Supplement No. 2 Section 7.3.2 includes an	TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 11	11. Y	Closed	Closed	EICB RAI	ML101680598,	
012	7.4	7.4	[illegible]	The original SER on Watts Bar (NUREG-0847) documents that the	TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 12	12. Y	Closed	Closed	EICB RAI	TVA Letter dated	
013	7.1.3.		[illegible]	Chapter 7 and Chapter 16 of Amendment 95 to the FSAR do not	TVA Letter Dated March 12, 2010 (Enclosure 1, Item No. 13	13. Y	Closed	Closed	EICB RAI	TVA Letter dated	TS have been docketed.
014	All	All	[illegible]	Provide the justification for any hardware and software changes	Date: 4/27/10	14. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
015			[illegible]	Verify that the refurbishment of the power range nuclear	Date: 4/27/10	15. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
016			[illegible]	Identify the precedents in license amendment requests (LARs), if	Date: 4/27/10	16. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
017	7.3.1	7.3.1,	[illegible]	Identify precedents in LARs, if any, for the solid state protection	Date: 4/27/10	17. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
018			[illegible]	Identify any changes made to any instrumentation and control	Date: 4/27/10	18. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
019			[illegible]	Verify that the containment purge isolation radiation monitor is the	Date: 4/27/10	19. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
020			[illegible]	Provide environmental qualification information pursuant to Section	Date: 4/27/10	20. Y	Closed	Closed	NRC Meeting	TVA Letter dated	**NNC 4/30/10:** SRP Section 7.0 states:
021		7.3	[illegible]	For the Foxboro Spec 200 platform, identify any changes in	Date: 5/25/10	21. Y	Closed	Closed	NRC Meeting	TVA Letter dated	The resolution of this item will be
022	7.3.2	5.6,	[illegible]	Verify the auxiliary feedwater control refurbishment results in a like-	Date: 4/27/10	22. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
023			[illegible]	Provide environmental qualification (10 CFR 50.49) information for	Date: 4/27/10	23. Y	Closed	Closed	NRC Meeting	TVA Letter dated	**NNC 4/30/10:** SRP Section 7.0 states:
024			[illegible]	Provide a schedule by the January 13, 2010, meeting for providing	During the January 13, 2010 meeting, TVA presented a	24. Y	Closed	Closed	NRC Meeting	N/A – Request for	**NNC 4/30/10:** Carte to address
025	7.5.2	7.5.1	[illegible]	For the containment radiation high radiation monitor, verify that the	Date: 4/27/10	25. Y	Closed	Closed	NRC Meeting	ML101230248,	
026			[illegible]	Provide environmental qualification (10 CFR 50.49) information for	Date: 4/27/10	26. Y	Closed	Closed	NRC Meeting	TVA Letter dated	**NNC 4/30/10:** SRP Section 7.0 states:
027	7.7.1.		[illegible]	For Foxboro I/A provide information regarding safety/non-safety-	Date: 4/27/10	27. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
028			[illegible]	For the turbine control AEH system, verify that the refurbishment	Responder: Mark Scansen	28. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
029			[illegible]	For the rod control system, verify that the refurbishment results in a	Date: 4/27/10	29. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
030			[illegible]	Regarding the refurbishment of I&C equipment, identify any	Responder: Clark	30. Y	Closed	Closed	NRC Meeting	TVA Letter dated	
031			[illegible]	For the rod position indication system (CERPI), provide information	Date: 4/27/10	31. Y	Closed	Closed	NRC Meeting	TVA Letter dated	CERPI is non-safety related.
032			[illegible]	For the process computer, need to consider cyber security issues	Date: 4/27/10	32. Y	Closed	Closed	NRC Meeting	TVA Letter dated	EICB will no longer consider cyber
033			[illegible]	For the loose parts monitoring system, provide information	Date: 4/27/10	33. Y	Closed	Closed	NRC Meeting	TVA Letter dated	The loose parts monitoring system is
034			[illegible]	2/4/2010	Responder: TVA	34. Y	Closed	Closed	N/A	TVA Letter dated	
034.			[illegible]	Chapter 7.1 – Introduction		35. Y	Closed	Closed	N/A	N/A	
034.			[illegible]	Chapter 7.2 - Reactor Trip System		36. Y	Closed	Closed	N/A	N/A	
034.	7.3	7.3	[illegible]	Chapter 7.3 – ESFAS		37. Y	Closed	Closed	N/A	N/A	
034.	7.5.1.	7.5.2	[illegible]	Chapter 7.5 - Instrumentation Systems Important to Safety		38. Y	Closed	Closed	N/A	N/A	Closed
034.	7.5.1.	7.5.2	[illegible]	Chapter 7.6 - All Other Systems Required for Safety		39. Y	Closed	Closed	N/A	N/A	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
034.				Chapter 7.7 Control Systems		40. Y	Closed	Closed	N/A	N/A	
035				2/18/2010	Responder: Clark	41. Y	Closed	Closed	RAI No. 1	TVA Letter dated	LIC-110 Section 6.2.2 states: "Design
036	7.5.2	7.5.1		February 18, 2010	Date: 5/25/10	42. Y	Closed	Closed	NRC Meeting		**NNC:** Unit 2 FSAR Section 7.5.1, "Post
037	7.5.1.	7.5.2		2/18/2010	Responder: Clark Date: 5/25/10	43. Y	Closed	Closed	N/A	TVA Letter dated	FSAR Amendment 100 provides
038	7.5.1.	7.5.2		2/18/2010	Responder: Clark Date: 5/25/10	44. Y	Closed	Closed	EICB RAI	TVA Letter dated	The slides presented at the December
039				January 13, 2010	Responder: Clark Date: 5/25/10	45. Y	Closed	Closed	EICB RAI	FSAR amendment	The equation for the calculation of the
040				January 13, 2010	Responder: Clark Date: 5/25/10	46. Y	Closed	Closed	EICB RAI EICB RAI	FSAR amendment	The equation for the calculation of the
041	7.5.2	7.5.1	EICB (Carte)	2/19/2010 Please provide the following Westinghouse documents: (1) WNA-DS-01617-WBT Rev. 1, "PAMS System Requirements Specification" (2) WNA-DS-01667-WBT Rev. 0, "PAMS System Design Specification" (3) WNA-CD-00018-GEN Rev. 3, "CGD for QNX version 4.5g" Please provide the following Westinghouse documents or pointers to where the material was reviewed and approved in the CQ TR or SPM: (4) WNA-PT-00058-GEN Rev. 0, "Testing Process for Common Q Safety systems" (5) WNA-TP-00357-GEN Rev. 4, "Element Software Test Procedure"	Responder: WEC Items (1) and (2) were docketed by TVA letter dated April 8, 2010. **Item (3) will be addressed by Revision 2 of the Licensing Technical Report. Due 12/3/10** 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** 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** 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. 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. **<u>TVA Response to Follow-up NRC Request:</u>** (1) WEC presented the results of the self assessment to the NRC on February 2, 2011. (2) By agreement between TVA, WEC and the NRC, the Post Accident Monitoring System Test Plan, WNA-PT-00138-WBT, Revision 0 will not be revised. Instead a non-proprietary Common Q PAMS Test Summary Report will be developed and submitted to address the issues with the STP. Attachment 1 contains non-proprietary WNA-TR-02451-WBT, Revision 0, "Test	1. N	Open Pending Submittal of the Test Summary Report due 3/29/11 Final Response included in letter dated 12/3/10 Partial Response is included in letter dated 10/5/10. The SysRS and SRS incorporate requirements from many other documents by reference. **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-NRC Review **Due 3/29/11** **NNC 1/27/11:** Issues with the STP were discussed in the weekly public meetings. Westinghouse to: (1) perfrom STP self assessment., and (2) Augment Test Summary report to provide missing test plan information **NNC 2/3/11:** At next audit compare & discuss: (1) WNA-PT-00058-GEN Rev. 0 (2) WNA-PT-00138-WBT Rev. 0 (3) AP1000 STP	NRC Meeting Summary NRC Meeting Summary ML093560019, Item No. 11	TVA Letter dated 6/18/10 TVA Letter dated 10/5/10	See also Open Item Nos. 226 & 270.

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
					Summary Report for the Post Accident Monitoring System," dated March 2011.						
042	All	All		February 25, 2010: Telecom	Date: 5/25/10	47. Y	Closed	Closed	EICB RAI	TVA Letter dated	The drawing provided did not have the
043	7.5.2	7.5.1	EICB (Carte)	2/19/2010 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: 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. 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. 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. NRC then concluded that TVA should go through and provide a more complete and thorough compliance matrix.	Responder: WEC Date: 5/25/10 The PAMS ISG6 compliance matrix supplied as Enclosure 1 to TVA letter dated February 5, 2010 is a first draft of the information needed. By letter dated April 8, 2010 TVA provided the PAMS Licensing Technical Report provided additional information. Attachment 3 contains the revised Common Q PAMS ISG-6 Compliance Matrix, dated June 11, 2010, that addresses these items (Reference 13). By letter Dated June 18, 2010 (see Attachment 3) TVA provided a table, "Watts Bar 2 - Common Q PAMS ISG-6 Compliance Matrix." 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. **TVA Response to Follow-up NRC Request:** 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: (1) While RSEDs are not specifically mentioned, Section 7 has been revised to be applicable to both hardware and software which includes the RSEDs. (2) Table 6-1 item 15 reference added for WNA-VR-00280-WBT (RESD) **TVA Response to Second Follow-up NRC Request:** The NRC audited the Westinghouse commercial item dedication process for both hardware and software during the week of February 28 to March 4, 2011. The audif found the processes acceptable. Westinghouse and TVA previously agreed to provide additional information to address this item in Revision 3 of the Licensing Technical Report.	2. N	Open Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. Revised response included in letter dated 12/22/10. Response is included in letter dated 10/5/10. Revised compliance matrix is unacceptable. **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-NRC Review **Due 3/29/11** **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 TVA Letter dated 5/12/10 TVA Letter dated 6/18/10 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. **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.

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 2 contains WNA-LI-00058-WBT-P, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3, dated March 2011 (proprietary). Attachment 3 contains WNA-LI-00058-WBT-NP, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3 dated March 2011 (non-proprietary). Attachment 4 contains CWA-11-311, Application for Withholding Proprietary Information from Public Disclosure, WNA-LI-00058-WBT-P, Revision 3 "Nuclear Automation Watts Bar 2 NSSS Completion Program I&C Projects, Post-Accident Monitoring System (PAMS) Licensing Technical Report," dated March 14, 2011.						
044	7.5.2	7.5.1	C	February 25, 2010	Date: 5/25/10	48. Y	Closed	Closed	EICB RAI	TVA Letter dated	
045			C	February 25, 2010	Date: 5/25/10	49. Y	Closed	Closed	EICB RAI	TVA Letter dated	
046			C	February 25, 2010	Date: 5/25/10	50. Y	Closed	Closed	N/A – Request for	N/A	
047	7.5.2	7.5.1	C	4/8/2010	Responder: WEC/Hilmes Date: 5/25/10	51. Y	Closed	Closed	EICB RAI	TVA Letter dated	
048	7.5.2	7.5.1	C	April 8, 2010	Date: 5/25/10	52. Y	Closed	Closed	EICB RAI	TVA Letter dated	
049	7.5.2	7.5.1	C	4/8/2010	Responder: WEC Date: 5/25/10	53. Y	Closed	Closed	EICB RAI	TVA Letter dated	
050	7.5.2	7.5.1	C	4/8/2010	Responder: WEC Date: 5/25/10	54. N	Closed	Closed	EICB RAI	TVA Letter dated	**NNC 11/18/10:** SysRS Rev. 2 contains
051			C	April 15, 2010	Date: 5/25/10	55. Y	Closed	Closed	N/A	N/A	Review addressed by another Open
052	7.5.2	7.5.1	S	April 19, 2010	Date: 5/25/10	56. Y	Closed	Closed	RAI No. 12		
053	7.5.2	7.5.1	S	April 19, 2010	Date: 5/25/10	57. Y	Closed	Closed	RAI No. 13		
054	7.5.2	7.5.1	S	4/19/2010	Responder: Slifer/Clark Date: 5/25/10	58. Y	Closed	Closed	RAI No. 14	TVA Letter dated	
055	7.5.2	7.5.1	S	4/19/2010	Responder: Slifer/Clark Date: 5/25/10	59. Y	Closed	Closed	RAI No. 15	TVA Letter dated	
056			S	April 19, 2010	Date: 5/25/10	60. Y	Closed	Closed	RAI No. 16	TVA Letter dated	Sorrento Radiation Monitoring
057	7.5.2	7.5.1	S	4/19/2010	Responder: TVA I&C Staff Date: 5/25/10	61. Y	Closed	Closed	RAI No. 17	TVA Letter dated	
058	7.5.0	7.5	S	April 19, 2010	Date: 5/25/10	62. Y	Closed	Closed	RAI No. 18	TVA Letter dated	
059	7.5.2	7.5.1	S	April 19, 2010	Date:	63. Y	Closed	Closed	RAI No. 19	TVA Letter dated	
060	7.5.2	7.5.1	C	April 19, 2010	Date: 5/25/10	64. Y	Closed	Closed	N/A	N/A	Addressed by Open Item No. 47
061	7.5.2	7.5.1	C	April 19, 2010	Date: 5/25/10	65. Y	Closed	Closed	N/A	N/A	Addressed by Open Item No. 48
062	7.5.2	7.5.1	C	April 19, 2010	Date: 5/25/10	66. Y	Closed	Closed	N/A	N/A	Addressed by Open Item No. 49
063	7.5.2	7.5.1	C	April 19, 2010	Date: 5/25/10	67. Y	Closed	Closed	N/A	N/A	Addressed by Open Item No. 50
064	7.5.2	7.5.1	C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: Webb Date: 4/8/2010	68. Y	Closed	Closed	N/A - No question	TVA Letter dated	
065	7.5.2	7.5.1	C	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	
066	7.5.2	7.5.1	C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: WEC Date: 5/25/10	70. Y	**Closed**	**Closed**	N/A - No question	TVA Letter dated	
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 The following status is from the revised WB2 Common Q PAMS ISG-6 Compliance Matrix submitted in response to Item 43: a. AI687, AI688 – Scheduled for September 28, 2010 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. c. Power supplies – Per Westinghouse letter WBT-D-2035	3. N	Open Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. Response included in letter dated 12/22/10. This item is addressed in Rev. 2 of the Licensing Technical Report	Open-NRC Review **Due: 3/29/11** **NNC 2/2/11:** Section 7 of the WBN2 PAMS LTR should be updated to include: (1) non-proprietary description of commercial grade dedication, and (2) Software example	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
					(Reference 12), these items are available for audit at the Westinghouse Rockville office. To be addressed during 9/20-9/21 audit **TVA Response to Follow-up NRC Request:** 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: 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. **TVA Response to Follow-up NRC Request dated 2/2/11:** The non-proprietary commercial grade dedication discussion is included in Attachment 3, WNA-LI-00058-WBT-NP, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3 dated March 2011 (non-proprietary) Section 7. The software example is included in Attachment 2, WNA-LI-00058-WBT-P, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3, dated March 2011 (proprietary) Section 7.			Commercial grade dedication will also be addressed at the next audit.			
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 The following status is from the revised WB2 Common Q PAMS ISG-6 Compliance Matrix submitted in response to Item 43: a. AI687, AI688 – Scheduled for September 28, 2010 b. Upgraded PC node box – Per Westinghouse letter WBT-D-2024 (Reference 7), this item is available for audit at the Westinghouse Rockville office. c. Flat panel displays – Per Westinghouse letter WBT-D-2024 (Reference 7), this item is available for audit at the Westinghouse Rockville office. d. Power supplies – Per Westinghouse letter WBT-D-2035 (Reference 12), these items are available for audit at the Westinghouse Rockville office. To be addressed during 9/20-9/21 audit TVA Response to Follow-up NRC Request: 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. The component level EQ/Seismic summary reports for the hardware listed above are available for NRC review/audit as	4. N	Open Response included in letter dated 12/22/10. This item is addressed in Rev. 2 of the Licensing Technical Report	Open-NRC Review **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
					described below: (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): 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 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 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 (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: a. CDI-3722, Revision 7, "Next Generation PC Node Box Commercial Dedication Instruction" b. LTR-EQ-10-50 "PC Node Box/Flat Panel Display System Components Qualification Summary" (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: a. CDI-3803, Revision 8, "Next Generation Flat Panel Display (FPD) Commercial Dedication Instruction" b. LTR-EQ-10-50 "PC Node Box/Flat Panel Display System Components Qualification Summary" (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: a. CDI- 4057, Revision 4, "Commercial Dedication Instruction" b. EQ-TP-1 05-GEN, Revision 0, "Electromagnetic Compatibility Test Plan and Procedure for Quint Power Supplies and Safety System Line Filter" 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" d. EQ-TP-117-GEN, Revision 0, "Environmental						

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
					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. 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 Attachment 1 contains non-proprietary WNA-TR-02451-WBT, Revision 0, "Test Summary Report for the Post Accident Monitoring System," dated March 2011.	5. N	Open Pending Submittal of the Test Summary Report due 3/29/11 Awaiting for document to be docketed by TVA.	Open-NRC Review **Due 3/29/11** **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	I C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: WEC Date: 5/25/10	71. N	Closed	Closed	N/A - No question	TVA Letter dated	**NNC 11/23/10:** The dues date in this
071	7.5.2	7.5.1	I C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: WEC Date: 5/25/10	72. N	Closed	Closed	N/A - No question	N/A	**NNC 11/23/10:** The dues date in this
072	7.5.2	7.5.1	I C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: WEC Date: 5/25/10	73. Y	Closed	Closed	N/A - No question	N/A	
073	7.5.2	7.5.1	I C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: WEC Date: 5/25/10	74. N	Closed	Closed	N/A - No question	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 Attachment 1 contains WNA-VR-00283-WBT-P, "IV&V Summary Report for the Post Accident Monitoring System," Revision 4, dated March 2011 (proprietary). Attachment 2 contains WNA-VR-00283-WBT-NP, "IV&V Summary Report for the Post Accident Monitoring System," Revision 4, dated March 2011 (non-proprietary). Attachment 3 contains CWA-11-3121, Application for Withholding Proprietary Information from Public Disclosure, WNA-VR-00283-WBT-P, Revision 4 "Nuclear Automation IV&V Summary Report for the Post Accident Monitoring System" (Proprietary)," dated March 3, 2011.	6. N	**Open** Response in letter dated March 16, 2011	**Open-NRC Review** **Due TBD** **NNC 2/3/11: At least 3 months later than planned.**	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.
075	7.5.2	7.5.1	I C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: WEC Date: 5/25/10	75. N	Closed	Closed	N/A - No question	N/A	
076	7.5.2	7.5.1	I C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: Clark Date: 5/25/10	76. Y	Closed	Closed	N/A - No question	N/A	
077	7.5.2	7.5.1	I C	By letter dated March 12, 2010 TVA stated that the target submittal	Responder: WEC Date: 5/25/10	77. Y	Closed	Closed	N/A - No question	TVA Letter dated	
078			I C	4/26/2010	Responder: Clark Date: 5/25/10	78. Y	Closed	Closed	EICB RAI	TVA Letter dated	
079			I C	4/26/2010	Responder: Clark Date: 5/25/10	79. Y	Closed	Closed	EICB RAI	TVA Letter dated	Reviewed under Item 154
080			I S	4/26/2010	Responder: WEC	80. Y	Closed	Closed	RAI No. 2	TVA Letter dated	
081	7.5.2	7.5.1	EICB (Carte)	5/6/2010 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: (1) RG 1.29 - September 1978 vs. March 2007 (2) RG 1.53 - June 1973 vs. November 2003 (a) IEEE 379-1994 vs. -2000 (3) RG 1.75 - September 1975 vs. February 2005 (a) IEEE 384-1992 vs. -1992 (4) RG 1.100 - June 1988 vs. September 2009 (a) IEEE 344-1987 vs. -2004 (5) RG 1.152 - January 1996 vs. January 2006 (a) IEEE 7-4.33.2-1993 vs. -2003 (6) RG 1.168 - September 1997 vs. February 2004 (a) IEEE 1012-1986 vs. -1998 (b) IEEE 1028-1988 vs. -1997 (7) IEEE 279-1991 vs. 603-1991 (8) IEEE 323-1983 vs. -1974 (RG 1.89 Rev. 1 June 1984 endorses	Responder: Merten/WEC 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. Bechtel to develop a matrix and work with Westinghouse to provide justification. **TVA Response to Follow-up NRC Request:** Attachment 4 contains the results of the TVA analysis of standards and regulatory guides applicable to the Common	7. N	Open ML101600092 Item No.1: There are three sets of regulatory criteria that relate to a Common Q application (e.g. WBN2 PAMS): (a) Common Q platform components – Common Q TR (b) Application Development Processes – Common Q SPM (c) Application Specific – current regulatory criteria The Common Q Topical Report and associated appendices primarily addressed (a) and (b). The Common Q SER states: '…Appendix 1, "Post Accident Monitoring Systems," provides	Open-NRC Review Due 2/25/11 TVA to provide requested information. **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. **NNC 4/125/2011:** See Open Item No. 364.

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
				323-1974) 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.	Q PAMS. Based on the results of the analysis, the Common Q PAMS design meets the applicable requirements and is acceptable.		the functional requirements and conceptual design approach for upgrading an existing PAMS based on Common Q components (page 58, Section 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")…' 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. 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. Awaiting TVA Response.				
082	7.5.2	7.5.1	I C C	5/6/2010	Responder: WEC Date: 6/18/10	81. N	Closed	Closed	EICB RAI	TVA Letter dated	**NNC 11/18/10:** See also Open Item No.
083	7.5.2	7.5.1	I C C	May 6, 2010	Date: 6/18/10	82. Y	Closed	Closed	EICB RAI	TVA Letter dated	
084	7.5.2	7.5.1	I C C	May 6, 2010	Date: 6/18/10	83. Y	Closed	Closed	EICB RAI	TVA Letter dated	
085	7.5.2	7.5.1	I C C	5/6/2010	Responder: WEC	84. N	Closed	Closed	EICB RAI		
086	7.5.2	7.5.1	EICB (Carte)	5/6/2010 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	Responder: WEC Date: 5/24/10 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	8. N	Open **TVA to address with item OI 81.**	Open-NRC Review Due 2/25/11 **NNC 2/3/11:** The	EICB RAI ML102910002 Item No. 14	TVA Letter dated 6/18/10	**NNC 1/6/11:** See Also Open Item No.81 & 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
				several regulatory documents, for example: (1) DI&C-ISG04 - Rev. 0 (ML072540138) vs. Rev. 1 (ML083310185) 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.	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. Rev 0 of the Licensing Technical Report references Rev. 1 of ISG4 **TVA Response to Follow-up NRC Request:** 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.			above due date has been **missed by at least 2 months.** Please provide new due date.			
087	7.5.2	7.5.1	– S	May 6, 2010	Date: 5/24/10	85. Y	Closed	Closed	RAI No. 20	TVA Letter dated	
088	7.5.2	7.5.1	– S	May 6, 2010	Date: 5/24/10	86. Y	Closed	Closed	RAI No. 21	TVA Letter dated	
089			– C	5/6/2010	Responder: Clark	87. Y	Closed	Closed	EICB RAI	TVA Letter dated	**NNC:** Docketed response states that
090			– C	5/6/2010	Responder: Clark Date: 5/25/10	88. Y	Closed	Closed	EICB RAI	TVA Letter dated	
091	7.4	7.4	– D a	May 20, 2010	Date: 5/25/10	89. Y	Closed	Closed	EICB RAI No.1	TVA Letter dated	
092			DORL (Poole)	5/20/2010 TVA to review Licensee Open Item list and determine which items are proprietary.	Responder: Hilmes This item will close when we are no longer using this document as a communications tool.	1. Y	Open Due SER Issue	Open-TVA/Oversight Due: SER Issue			Continuous review as items are added
093			– C	May 20, 2010	Date: 5/25/10	90. Y	Closed	Closed	N/A	N/A	Will be reviewed under item 154
094			– C	5/20/2010	Responder: Clark Date: 5/25/10	91. Y	Closed	Closed	N/A	N/A	Information was found in FSAR
095	7.8.1,	XX	– D a	May 20, 2010	Date:	92. Y	Closed	Closed	EICB RAI No. 2	TVA Letter dated	
096	7.7.5	XX	– D a	5/20/2010	Responder:	93. Y	Closed	Closed	EICB RAI No.3	TVA Letter dated	
097	7.4.2	7.4	– D a	May 20, 2010	Date:	94. Y	Closed	Closed	EICB RAI No.4	TVA Letter dated	
098	7.4.2	7.4	– D a	May 25, 2010	Date:	95. Y	Closed	Closed	EICB RAI No.5	TVA Letter dated	
099			– B a	April 12, 2010	Date:	96. Y	Closed	Closed			Closed to Item 129
100			– C	5/20/2010	Responder: WEC	97. Y	Closed	Closed	N/A - No question	N/A	
101			DORL (Poole)	4/12/2010 The non-proprietary versions of the following RM-1000, Containment High Range Post Accident Radiation Monitor documents will be provided by June 30, 2010. 1. V&V Report 04508006A 2. System Description 04508100-1TM 3. Qualification Reports 04508905-QR, 04508905-1 SP, 04508905-2SP, 04508905-3SP 4. Functional Testing Report 04507007-1TR	Responder: Slifer 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.	9. Y	Open Documents provided in letter dated 07/15/10	Open-NRC Review Due 10/14/10 **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			– C	May 24, 2010	Date: 5/24/10	98. Y	Closed	Closed	N/A	TVA Letter dated	Request for schedule not information.
103	7.4	7.4	– D a	5/27/2010	Responder: Ayala Date: 5/27/10	99. Y	Closed	Closed	EICB RAI No.1	TVA Letter dated	Submittal date is based on current

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
104	7.4	7.4	Dias	5/27/2010	Responder: Merten Date: 5/27/10	100. Y	Closed	Closed	EICB RAI No.1	TVA Letter dated	Submittal date is based on current
105			Cliff	April 29, 2010	Date:	101. Y	Closed	Closed	N/A	N/A	Will be reviewed under item 154.
106			Sher	May 6, 2010	Date: 5/25/10	102. Y	Closed	Closed	RAI No. 9	TVA Letter dated	
107			Sher	May 6, 2010	Date: 5/28/10	103. Y	Closed	Closed	RAI No. 22	TVA Letter dated	
108			Cliff	May 6, 2010	Date: 5/25/10	104. Y	Closed	Closed	N/A	N/A	Will be reviewed under OI#154
109.	7.8	XX	Dias	5/6/2010	Responder: N/A	105. Y	Closed	Closed	N/A	N/A	
109.			Cliff	5/6/2010	Responder: N/A	106. Y	Closed	Closed	N/A	N/A	Duplicate of another open Item.
110			Cliff	May 6, 2010	Date:	107. Y	Closed	Closed	N/A	N/A	Information was found.
111			Cliff	May 6, 2010	Date: 5/28/10	108. Y	Closed	Closed	N/A	TVA Letter dated	Request to help find, not a request for
112			Cliff	June 1, 2010	Date:	109. Y	Closed	Closed	N/A	N/A	Information was received
113			Cliff	6/1/2010	Responder: Clark	110. Y	Closed	Closed	EICB RAI	TVA Letter dated	
114	7.2	7.2	Cliff	6/1/2010	Responder: WEC	111. Y	Close	Closed	EICB RAI	TVA Letter dated	
115			Cliff	2/25/2010	Responder: Clark	112. Y	Closed	Closed	EICB RAI	TVA Letter dated	
116			Cliff	6/3/2010	Responder: WEC	113. Y	Closed	Closed	EICB RAI	TVA Letter dated	Letter sent to Westinghouse requesting
117	7.1	7.1	Cliff	6/3/2010	Responder: Hilmes	114. Y	Closed	Closed	EICB RAI	TVA Letter dated	
118	7.4	7.4	Dias	6/8/2010	Responder: Merten	115. Y	Closed	Closed	EICB RAI No.1	TVA Letter dated	Submittal date is based on current
119			Sher	June 10, 2010	Date:	116. Y	Closed	Closed	RAI No. 23	TVA Letter dated	
120			Cliff	5/6/2010	Responder: Hilmes/Merten/Costley	117. Y	Closed	Closed	EICB RAI	TVA Letter dated	
121			Cliff	5/6/2010	Responder: Webb/Webber	118. Y	Closed	Closed	EICB RAI	TVA Letter dated	
122			Cliff	June 14, 2010	Date:	119. Y	Closed	Closed	N/A - Request for	N/A	
123	7.7.3	7.4.1,	Dias	6/14/2010	Responder:	120. Y	Closed	Closed	ML101720589,	TVA Letter dated	
124	7.7.5	XX	Dias	6/14/2010	Responder:	121. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
125	7.7.8	7.7.1.12	Dias	6/14/2010	Responder:	122. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
126	7.8	7.8	Dias	June 14, 2010	Date:	123. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
127	7.2	7.2	Cliff	6/16/2010	Responder: WEC/Clark	124. Y	Closed	Closed	EICB RAI	TVA Letter dated	
128	7.2	7.2	Cliff	6/18/2010	Responder: WEC Drake /TVA Craig	125. Y	Closed	Closed	EICB RAI	TVA Letter dated	Track through SE open item
129			Pham	6/12/2010	Responder: WEC	126. Y	Closed	Closed	N/A	TVA Letter dated	
130			Pham	6/28/2010	Responder: Clark	127. Y	Closed	Closed	N/A	TVA Letter dated	
131			Pham	6/28/2010	Responder: Clark	128. Y	Closed	Closed	N/A	TVA Letter dated	
132			Pham	6/28/2010	Responder: Clark	129. Y	Closed	Closed	N/A	TVA Letter dated	
133			Pham	6/28/2010	Responder: Clark	130. Y	Closed	Closed		TVA Letter dated	
134			Pham	6/28/2010	Responder: Clark	131. Y	Closed	Closed		TVA Letter dated	
135	7.3.1	7.3.1	Dias	6/30/2010	Responder: Clark	132. Y	Closed	Closed	RAI not necessary	TVA Letter dated	
136	7.3.2,	7.4, 5.6,	Dias	6/30/2010	Responder: Clark	133. Y	Closed	Closed	RAI not necessary	TVA Letter dated	
137			Cliff	Several WBN2 PAMS documents contain a table titled, "Document	Responder: WEC	134. Y	Closed	Closed	ML101650255, Item	TVA Letter dated	
138			EICB (Carte)	By letter dated February 3, 2010, Westinghouse informed TVA that certain PAMS documentation has been completed. (a) The draft ISG6 states that a commercial grade dedication plan should be provided with an application for a Tier 2 review. 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	Responder: WEC **<u>This item is used to track all Commercial Grade Dedication issues.</u>** 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:	10. N	Open Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. Revised response included in letter dated 12/22/10 TVA agreed to include a	Open-NRC Review **NNC 2/2/11:** Commercial grade dedication will be addressed at the next audit. **NNC 2/17/11:** The description of the	ML101650255, Item No. 2		See also No. 82.

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
				Grade Dedication Program, and states: "A detailed review plan is developed for each Common Q hardware or software component that requires commercial grade dedication." 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. (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. (i) Please provide 00000-ICE-37722 Rev. 0, "Commercial Grade Dedication Report for the QNX Operating System for Common Q Applications." (ii) Please provide WNA-CD-00018-GEN Rev. 3, "Commercial Dedication Report for QNX 4.25G for Common Q Applications."	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. 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) 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. **TVA Response to Follow-up NRC Request:** The non-proprietary commercial grade dedication discussion is included in Attachment 3, WNA-LI-00058-WBT-NP, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3 dated March 2011 (non-proprietary) Section 7. The software example is included in Attachment 2, WNA-LI-00058-WBT-P, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3, dated March 2011 (proprietary) Section 7.		description of the generic Westinghouse hardware commercial grade dedication process in the PAMS licensing technical report. (see ML102920031 Item No 1) TVA agreed to include (in the PAMS licensing technical report) an evaluation of WBN2 critical characteristics for commercial Westinghouse hardware components against the generic critical characteristics. (see ML102920031 Item No 2) TVA agreed to include a description of the generic Westinghouse software commercial grade dedication process in the PAMS licensing technical report. (see ML102920031 Item No 3) TVA agreed to include (in the PAMS licensing technical report) an evaluation of WBN2 critical characteristics for commercial software components against the generic critical characteristics. (see ML102920031 Item No 4)	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.			
139			I&C	The WBN2 PAMS System Requirements Specification (WBN2	Responder: WEC	135. Y	Closed	Closed	ML101650255, Item	TVA Letter dated	WBN2 PAMS System Requirements
140			I&C	The first requirement in the WBN2 PAMS SysRS (i.e., R2.2-1)	Responder: Clark	136. N	Closed	Closed	ML101650255, Item	TVA Letter dated	WBN2 PAMS System Requirements
141			I&C	Deleted by DORL	Date:	137. Y	Closed	Closed	ML101650255, Item		WBN2 PAMS System Requirements
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…" 1. How did TVA ensure the traceability of each requirement in the WBN2 PAMS SysRS.	Responder: WEC **This item is used to track all traceability issues with the Software Requirements Specification (SRS).** **TVA Response to 1:** Traceability of requirements for the WBN Unit 2 Common Q PAMS is ensured by: **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). **b.** Engineering review/comment/status of each revision of: **i.** WNA-DS-01617-WBT, "Post Accident Monitoring System - System Requirements Specification" **ii.** WNA-DS-01667-WBT, "Post Accident Monitoring System – System Design	11. N	Open Revised response included in letter dated 02/25/11 Response included in letter dated 12/22/10 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	Open-NRC Review Due 2/25/11 (document submittals) **NNC 2/2/11:** Updated Specifications and RTMs to be provided by TVA Tracability to be addressed during the next audit.	ML101650255, Item No. 6		WBN2 PAMS System Requirements Specification 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
					iii. WNA-SD-00239-WBT, "Software Requirements Specification for the Post Accident Monitoring System" (software)		elements. (see ML102920031 Item No 5)				
				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?	**TVA Response to 2:** 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. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 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? 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. 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).] 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:** 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. 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. 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:** The Westinghouse SRS, WNA-SD-00239-WBT, Revision 3 contains references to other Westinghouse software requirements documents. Specifically, 00000-ICE-3238, Revision 5, "Software Requirements Specification Post Accident Monitoring System" 00000-ICE-3239, Revision 13, "Software Requirements Specification for the Common Q Generic Flat Panel Display Software" 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…".	**TVA Response to 5:** 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,"						

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				These references are used in the body of the SRS, for example:“ 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]).] They are also included via tables such as found in requirement R7.1.2-1 [The Watts Bar 2 PAMS shall use the application-specific type circuits and custom PC elements listed in Table 7.1-1.] Do the referenced reusable software element documents include requirements not explicitly stated in the SRS? If so what is their origin?	dated December 2010 (Attachment 10). 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. *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.* 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.* **TVA Response:** See response to letter Item 13 (NRC Matrix Item 145). 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.* **TVA Response:** See response to letter Item 13 (NRC Matrix Item 145). 3. *Westinghouse will add a comments column in the Requirements Traceability Matrix (RTM) to address items not in the SRS or SysRS.* **TVA Response:** 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.” 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. *IEEE 830 says you shouldn’t have planning information in the SRS. Westinghouse has agreed to remove this information.* **TVA Response:** Westinghouse has confirmed that process requirements have been removed from the SRS. Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: Common Q RAI concerns, dated December 8, 2010 (Reference 17) 5. *IEEE 830 says you shouldn’t have process requirements in the SRS. Westinghouse has agreed to remove these requirements.*						

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					TVA Response: Westinghouse confirmed that process requirements have been removed from the SRS. Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: Common Q RAI concerns, dated December 8, 2010 (Reference 17) 6. *Westinghouse will perform and document an evaluation of the SRS to ensure compliance with Reg. Guide 1.172 and justify any deviations.* **TVA Response:** 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 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. 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?* **TVA Response:** 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. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) 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.* **TVA Response:** The hardware requirements in the Software Requirements Specification have been deleted and moved to System Design Specification. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 16, 2010 (Reference 15) 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.* **TVA Response:** Westinghouse CAPs IR# 10-259-M034 has been issued. This item will be addressed in revision 4 of the						

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					RTM. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) 10. *Westinghouse to improve the traceability of the tests that are performed with the function enable (FE) switch in the "ENABLE" position.* **TVA Response:** 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." 11. *Westinghouse to revise documents to be consistent with referring to the FE switch in the "ENABLE" position.* **TVA Response:** 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: *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." *b.* SysRS Revision 3 is not consistent in use of the term "ENABLE" as noted below: *i.* R2.5.2.1-2 uses the term "ENABLED" instead of "ENABLE" *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" *c.* Revision 3 of the SRS is not consistent in use of the terms "FE keyswitch" and "ENABLE" as noted below: *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. *ii.* Section 2.1, page 2-4, uses the term "Enable" instead of "ENABLE" *iii.* Requirements R7.2.14-6 and R7.2.16-7 use the term "active" instead of "ENABLE" *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" *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						

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					keyswitch" as noted below: *i.* Section 2.2 "System Description" and Table 3-1 "WB2 PAMS FMEA" refer to the FE switch. *ii.* Table 3-1 describes the switch as the "Functional Enable (FE) switch" and the "FE key-switch" *e.* Revision 2 of the Licensing Technical Report is not consistent in use of the term "FE keyswitch" as noted below: *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) 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. 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.* **TVA Response:** See response to letter item 13 (NRC Matrix Item 145). 13. *Westinghouse and TVA will develop a revised schedule for document submittals and provide it to the NRC no later than 9/30/10* **TVA Response:** 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). 14. *TVA will update the Procurement Requisition Resolution Matrix and submit it to show how the Common Q PAMS design meets the contract requirements.* **TVA Response:** 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." 15. *Westinghouse to add the Software Design Descriptions to the RTM* **TVA Response:** The Software Design Description documents were added to the RTM in WNA-VR-00279-WBT, Rev 2. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13)						

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					16. Westinghouse to clarify how requirements or documents are incorporated by reference into the Common Q PAMS requirements. **TVA Response:** When a Common Q PAMS requirements document references a section of another document, all requirements in that section are applicable. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) *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.* **TVA Response:** See response in letter dated December 22, 2010, item 2 (NRC Matrix Item 050). *18. Westinghouse to resolve the following questions concerning Software Design Descriptions (SDDs)* *a. Is the SDD a standalone document or will it incorporate the generic SDD by reference?* *b. What are the SDDs?* *c. PAMS is a delta document so how do we capture all the generic requirements for traceability.* **TVA Response:** 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. b. The SDDs developed for this project are: 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" 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" 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" iv. Other generic SDDs referenced by 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
					PAMS project are: (a) 00000-ICE-20157, Revision 18, "Software Design Description for the Common Q Generic Flat-Panel Software" (b) 00000-ICE-30152, Revision 5, "Software Design Description Post Accident Monitoring System AC160" (c) 00000-ICE-30140, Revision 4, "Software Design Description for the Common Q Core Protection Calculator System Database and Utility Functions" c. Refer to WNA-VR-00279-WBT, Revision 3. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) 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. **TVA Response:** 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. WCAP-15927 is on the AP1000 docket. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) **TVA Response to Follow-up NRC Request:** 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. Attachment 9 contains the proprietary version of WNA-DS-01617-WBT-P, Revision 4, "Post Accident Monitoring System - System Requirements Specification," 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
					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. 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 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. 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.						
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 …" (a) Please list and describe each of the "major software components". Please include a description of any NRC review for each of these components. (b) Please list and describe each of the other software components. Please include a description of any NRC review for each of these components. (c) What other documents contain the requirements for the other software components? The WBN2 PAMS System Design Specification (WBN2 PAMS SDS) contains a table (see page iii) titled, "Document Traceability	Responder: WEC Addressed in the 9/15 public meeting and 9/20 - 9/21 audit. A detailed explanation will be provided. **TVA Response:** (a) and (b) The requested information is provided in the following documents: 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). ii. WNA-DS-01617-WBT-P, Revision 3, "Post Accident Monitoring System- System Requirements Specification," dated December 2010 (Attachment 1)	12. N	Open Response included in letter dated 12/22/10	Open-NRC Review Due 2/25/11 (document submittals) To be addressed by Revision of the RTM, SRS, SysRS, and SysDS. **NNC 2/2/11:** Updated Specifications and RTMs to be provided by TVA **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 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
				& 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 …" (c) Do the WBN2 PAMS SRS and SDS, together, implement all of the requirements in the WBN2 PAMS SysRS? (e) Please briefly describe all of the documents that implement the WBN2 PAMS SysRS.	iii. WNA-SD-00239-WBT-P, Revision 3, "Software Requirements Specification for the Post Accident Monitoring System," dated December 2010 (Attachment 7) 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) To the best of TVA's knowledge, no prior NRC review of the software components has been performed. (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) (d) No. Please see Item (e) below. (e) The documents that describe the requirements that implement the WBN Unit 2 SysRS are: 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) 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) Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 (Reference 13) **TVA Response to Follow-up NRC Request:** See Response to item 3 (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). (a) Please describe the third document (i.e., NABU-DP-00014-GEN Revision 2, "Design Process for Common Q Safety Systems"). (b) Please describe the flow of information between these three documents. (c) Does the PAMS SRS implement the requirements in these three documents? (d) Please describe if and how these three documents are used in	Responder: WEC (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.	13. N	Open Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. Revised response included in letter dated 12/22/10 Response provided in letter dated 10/5/10 NRC Review and WEC to complete response.	Open-NRC Review Due 3/29/11 Responses to items a and e provided. **NNC 11/18/10:** (1) Items b-d closed to other Open Item nos. (2) The point of these questions was to understand how the origin of the requirements in the requirements	ML101650255, Item No. 8	TVA Letter dated 10/5/10	WBN2 PAMS Software Requirements Specification 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
				the development of the PAMS Software Design Description. (e) Do the WBN2 V&V activities include verification that the requirements of these three documents have been incorporated into the WBN2 PAMS SRS.	(b) – Closed to items 142 and 145 (c) – Closed 142 (d) – Closed to Item 142 (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). 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. 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. **TVA Response to Follow-up NRC Request:** (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. (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: Section 11, "TVA Contract Compliance Matrix" showing the origin of the requirements was added. **TVA Response to Second Follow-up NRC Request:** Section 13, Origin Tracing of WBN2 PAMS System Requirements Specification was added to the Licensing Technical Report Revision 3 to address this concern. Attachment 2 contains WNA-LI-00058-WBT-P, "Post-		b-d to be addressed at public meeting and audit. Will require information to be docketed.	specifications were documented. TVA stated that the origin of the requirements would be demonstrated in Rev. 2 of the CQ PAMS LTR. **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.			

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 (PAMS) Licensing Technical Report," Revision 3, dated March 2011 (proprietary).						
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. (a) Does the WBN2 PAMS SDS implement all of the hardware requirements in the WBN2 PAMS SysRS? (b) Please briefly describe all of the documents that implement the hardware requirements of the WBN2 PAMS SysRS. **This item is used to track all traceability issues with the System Design Specification (SDS).** **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.** 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. 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. 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. 4. TVA will update the Procurement Requisition Resolution Matrix and submit it to show how the Common Q PAMS design meets the contract requirements. 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. 6. Westinghouse to provide the generic AC160 and flat panel specifications. 7. Westinghouse and TVA to develop a schedule of licensing document submittals that can be met by the project team. 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.	Responder: WEC (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. (2) Please see letter Item 10 (NRC Matrix Item 142, sub item 13). (3) Please see letter Item 10 (NRC Matrix Item 142, sub item 12). (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). (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. (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. 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. (7) A schedule was developed and is reviewed weekly by Westinghouse and TVA project management. (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. (9) The flow of documentation information was provided to the NRC inspector during the Common Q PAMS audit. Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: RAI on SysRS, dated December 8, 2010 **TVA Response to Follow-up NRC Request:** See Response to item 3 (Item number 142)	14. N	Open Response included in letter dated 12/22/10 During the September 20-21, 2010 audit at Westinghouse, it was acknowledged that TVA/Westinghouse had previously (in September 15, 2010 public meeting) stated: TVA would provide the RSED RTM. (see ML102920031 Item No 6) TVA would revise and resubmit the PAMS RTM to address all types of issues identified in the public meeting. (see ML102920031 Item No 7) 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)	Open-NRC Review Due 2/25/11 To be addressed by Revision of the RTM, SRS, SysRS, and SysDS.	ML101650255, Item No. 9		WBN2 PAMS System Design Specification TVA docketed WNA-DS-01667-WBT Rev. 1, "RRAS Watts Bar 2 NSSS Completion Program I&C Projects Post Accident Monitoring System- System Design Specification," dated December 2009.
146			~~EICB~~	6/17/2010	Responder:	138. Y	Closed	Closed	ML101650255, Item		PAMS System Requirements

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147			Carte	6/17/2010	Responder:	139. Y	Closed	Closed	ML101650255, Item		PAMS System Requirements
148			Carte	6/17/2010	Responder:	140. Y	Closed	Closed	ML101650255, Item		PAMS System Requirements
149	7.2	7.2	Carte	FSAR Section 7.1.1.2(2), Overtemperature delta T and	Responder: Tindell	141. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
150	7.2	7.2	Carte	Many of the changes were based on the Westinghouse document	Responder: Clark	142. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
151	7.2	7.2	Carte	Provide the EDCR 52378 and 54504 which discusses the basis for	Responder: Clark	143. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
152	7.2	7.2	Carte	Deleted portion of FSAR section 7.2.3.3.4 and moved to FSAR	Responder: Merten/Clark	144. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
153	7.2	7.2	Carte	FSAR section 7.2.1.1.7 added the reference to FSAR section	Responder: Craig/Webb	145. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
154	7.2	7.2	Carte	FSAR section 7.2.1.1.10, setpoints: NRC staff has issued RIS	Responder: Craig/Webb	146. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	EICB RAI ML102861885 sent to DORL
155	7.2	7.2	Carte	Summary of FSAR change document section 7.2 states that	Date:	147. Y	Closed	Closed	ML101720589, Item		
156	7.2	7.2	Carte	FSAR section 7.2.2.1.1 states that dashed lines in Figure 15.1-	Responder: WEC	148. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	Response on hold pending
157	7.2	7.2	Carte	FSAR section 7.2.2.1.1, fifth paragraph was deleted except for the	Responder: Tindell	149. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
158	7.2	7.2	Carte	FSAR section 7.2.2.1.1, paragraph six was changed to state that	Responder: Tindell	150. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
159	7.2	7.2	Carte	FSAR section 7.2.2.1.2 discusses reactor coolant flow	Responder: Craig	151. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
160	7.2	7.2	Carte	FSAR section 7.2.2.2(7) deleted text which has references 12 and	Responder: Tindell	152. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
161	7.2	7.2	Carte	FSAR section 7.2.2.3 states that changes to the control function	Responder: Clark	153. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
162	7.2	7.2	Carte	FSAR section 7.2.2.2(14) states that bypass of a protection	Responder: Tindell	154. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
163	7.2	7.2	Carte	Deleted by DORL	Date:	155. Y	Closed	Closed	ML101720589, Item		
164	7.2	7.2	Bolger	FSAR section 7.2.2.2(20) has been revised to include the plant	Responder: Perkins	156. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	Item No. 8 sent to DORL
165	7.2	7.2	Carte	FSAR section 7.2.2.3.2, last paragraph of this section has been	Responder: Clark	157. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
166	7.2	7.2	Carte	Changes to FSAR section 7.2.2.2(20) are justified based on the	Responder: Clark	158. Y	Closed	Closed	ML101720589, Item	TVA Letter dated	
167	7.2	7.2	Carte	FSAR section 7.2.2.4, provide an analysis or reference to chapter	Responder: Clark	159. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
168	7.2	7.2	Carte	FSAR table 7.2-4, item 9 deleted loss of offsite power to station	Responder: Clark	160. Y	Close	Closed	ML101720589, Item	TVA Letter dated	
169			Carte	6/18/2010	Responder: Clark	161. Y	Closed	Closed			
170			Carte	6/17/2010	Responder: Clark	162. Y	Closed	Closed			
171	7.2	7.2	Carte	6/17/2010	Responder: Craig	163. Y	Closed	Closed	EICB RAI	TVA Letter dated	Closed to SE Open Item
172			Carte	6/17/2010	Responder: Craig	164. Y	Closed	Closed	EICB RAI		
173	7.1	7.1	Carte	6/17/2010	Responder: Craig/Webb/Powers	165. Y	Closed	Closed	EICB RAI		
174			Carte	6/28/2010	Responder: Hilmes/Craig	166. Y	Closed	Closed	EICB RAI		
175			Carte	June 28, 2010	Responder:	167. Y	Closed	Closed	EICB RAI		
176	7.1	7.1	Carte	6/28/2010	Responder: Craig/Webb	168. Y	Closed	Closed	EICB RAI		
177	7.5.2.	7.5.1	Nana	7/15/2010	Responder: Clark	169. Y	Closed	Closed	N/A	TVA Letter dated	RAI not required
178	7.5.2.	7.5.1	Nana	7/15/2010	Responder: Clark	170. Y	Closed	Closed	N/A	TVA Letter dated	RAI not required
179			Carte	An emphasis is placed on traceability in System Requirements	Responder: WEC	171. Y	Closed	Closed	N/A – Closed to	NA	
180			Carte	The SRP, BTP 7-14, Section B.3.3.1 states that Regulatory Guide	Responder: WEC	172. Y	Closed	Closed	N/A – Closed to	NA	
181			Carte	An emphasis is placed on traceability in System Requirements	Responder: WEC	173. Y	Closed	Closed	N/A – Closed to	NA	
182			Carte	Characteristics that the SRP states that a Software Requirements	Responder: WEC	174. Y	Closed	Closed	N/A – Closed to	NA	
183			EICB (Carte)	7/15/2010 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”	Responder: WEC The generic Software Requirements Specification applies except as modified by the WBN Unit 2 System Requirements Specification. **TVA Response to Follow-up NRC Request:** Please see the response to RAI item 12 in letter dated	15. Y	Open Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. Revised response included in letter dated 12/22/10.	Open-NRC Review **Due 3/29/11** **NNC 11/18/10**: The point behind this open item was that TVA must demonstrate that the origin of each	EICB RAI ML102980066 Item No. 9	TVA Letter dated 10/21/10 Enclosure 1 Item No. 4	

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 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? If there are additional changes, what is their origin?	12/22/10, NRC Matrix Item 144. **TVA Response to Second Follow-up NRC Request:** This item was addressed by updating the Contract Compliance Matrix and adding Section 13, Origin Tracing of WBN2 PAMS System Requirements Specification to the Licensing Technical Report Revision 3 to address this concern. Attachment 2 contains WNA-LI-00058-WBT-P, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3, dated March 2011 (proprietary).		Response provided in letter dated 10/21/10	requirement in the WEC requirements specification is known and documented. TVA stated that this information would be in CQ PAMS LTR Rev. 2. **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.			
184			– C	7/15/2010	Responder: WEC	175. Y	Closed	Closed	N/A – Closed to	N/A	
185			EICB (Carte)	7/15/2010 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. References 12, 27, 29, and 31-44 in the Post Accident Monitoring System's Software Requirements Specification are various types of "…Reusable Software Element…". These references are used in the body of the SRS, for example:" 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]).] They are also included via tables such as found in requirement R7.1.2-1 [The Watts Bar 2 PAMS shall use the application-specific type circuits and custom PC elements listed in Table 7.1-1.] Do the referenced reusable software element documents include requirements not explicitly stated in the SRS? If so what is their origin?	Responder: WEC Steve Clark to look at how to combine traceability items. Was addressed to during the 9/15 meeting and 9/20 - 9/21 audit. **TVA Response to Follow-up NRC Request:** (1) See NRC Matrix Item 144 (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.	16. N	Open Response included in letter dated 12/22/10.	Open-NRC Review **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 **NNC 2/3/11:** To be addressed during next audit.	EICB RAI ML102980066 Item No. 17		
186	7.7.8	7.7.1.12	– D a	7/15/2010	Responder: Perkins/Clark	176. Y	Closed	Closed	EICB RAI No.6	TVA Letter dated	
187			– C	By letter dated June 18, 2010, TVA docketed responses to NRC	Responder: Merten	177. N	Closed	Closed	ML101970033, Item	TVA Letter dated	Are these connections already
188			– C	By letter dated June 30, 2010, TVA docketed, "Tennessee Valley	Responder: Clark	178. Y	Closed	Closed	ML101970033, Item	TVA Letter dated	
189		7.6.7	– S	7/20/2010	Responder: Clark	179. Y	Closed	Closed	RAI No. 3	TVA Letter dated	
190	7.9		– S	FSAR Table 7.1-1 states: "Regulatory Guide 1.133, May 1981	Responder: Clark	180. Y	Closed	Closed	RAI No. 4	TVA Letter dated	Closed to OI-331.

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191	7.9		C	NUREG-0800 Chapter 7, Section 7.9, "Data Communication	Responder: Jimmie Perkins	181. Y	Closed	Closed	ML10197016, Item	TVA Letter dated	
192	7.5.1.	7.5.2	NNA	The NRC Staff is using SRP (NUREG-0800) Chapter 7 Section	Responder: Clark	182. Y	Closed	Closed	Item No. 1 sent to	TVA Letter dated	EICB RAI ML1028618855 sent to
193	7.5.1.	7.5.2	NNA	The WBU2 FSAR, Section 7.5.2, “Plant Computer System,”	Responder: Clark	183. Y	Closed	Closed	Item No. 2 sent to	TVA Letter dated	EICB RAI ML1028618855 sent to
194	7.5.1.	7.5.2.1	NNA	The WBU2 FSAR Section 7.5.2.1, “Safety Parameter Display	Responder: Costley/Norman	184. Y	Closed	Closed	Item No. 3 sent to	TVA Letter dated	EICB RAI ML1028618855 sent to
195	7.5.1.	7.5.2.2	NNA	Bypassed and Inoperable Status Indication (BISI)	Responder: Costley/Norman	185. Y	Closed	Closed	Item No. 4 sent to	TVA Letter dated	EICB RAI ML1028618855 sent to
196	7.5.1.	7.5.2.2	NNA	Bypassed and Inoperable Status Indication (BISI)	Responder: Costley/Norman	186. Y	Closed	Closed	Item No. 5 sent to	TVA Letter dated	EICB RAI ML1028618855 sent to
197			X	Open Item 197 was never issued.		187. Y	Closed	Closed			
198	7.5.1.	7.5.2.2	NNA	SRP Section 7.5, Subsection III, “Review Procedures” states:	Responder: Costley/Norman	188. Y	Closed	Closed	Item No. 6 sent to	TVA Letter dated	EICB RAI ML1028618855 sent to
199	7.5.1.	7.5.2.3	NNA	The WBU2 FSAR Section 7.5.2.3, “Technical Support Center and	Responder: Costley/Norman	189. Y	Closed	Closed	Item No. 7 sent to	TVA Letter dated	Related SE Section 7.5.5.3 EICB RAI
200	7.2			7/21/2010	Responder: Clark	190. Y	Closed	Closed	EICB RAI	TVA Letter dated	
201	7.7.1.	7.7.11	C	7/21/2010	Responder: Webb	191. Y	Closed	Closed	EICB RAI	TVA Letter dated	
202	7.5.2		EICB (Carte)	7/22/2010 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 Revision 1 of the Licensing Technical Report will provide more detailed information on the changes to the platform. Rev. 2 of the Licensing Technical Report will include the applicability of guidance. **TVA Response to Follow-up NRC Request:** 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: 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. 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. Source: E-mail from Westinghouse (Matthew A. Shakun) to Bechtel (Mark S. Clark), RE: December 22 letter review, dated December 17, 2010 **Partial TVA Response to Follow-up NRC Request:** 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. The final response is pending submittal of the Licensing Technical Report Revision 3 scheduled for March 29, 2011. **TVA Response to Follow-up NRC Request:**	17. N	Open Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. Response included in letter dated 12/22/10 Partial Response provided in letter dated 10/5/10 **NNC 1/5/11:** Summary provided in Licensing Technical Report R2 has been reviewed and found to be unacceptable. LTR Section 9 evaluates the compliance of the SRS to IEEE 830-1998. There are two issues with this evaluation: (1) IEEE 830-1998 is not the current SRP acceptance criteria. IEEE 830-1998 has not been formally endorsed by a regulatory guide. (2) Westinghouse committed to evaluate the SRS against 830 when the NRC identified several inconsistencies. Yes ISG-4 is one new criteria, and an evaluation against it has been provided. 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.”	Open-NRC Review **Due 2/25/11 & 3/29/11** to provide information requested. 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.

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) As discussed on page 9-1 of the Licensing Technical Report (Attachment 2) a comparison of IEEE 830-1993 and IEEE 830-1998 was performed and it was determined that the 1998 version enveloped all the requirements of the 1993 version which is endorsed by Regulatory Guide 1.172. Therefore the use of IEEE 830-1998 is acceptable. *(2)* Table 9.1 "IEEE Std 830-1998 Compliance" of the Licensing Technical Report (Attachment 2) evaluates the Software Requirements Specification against the requirements of IEEE 830-1998. *(3)* See TVA to NRC letter "Watts Bar Nuclear Plant (WBN) Unit 2 – Instrumentation And Controls Staff Information Requests," dated February 25, 2011 Attachment 4 "Common Q PAMS Regulatory Guide and IEEE Standard Analysis." *(4)* This section of the Licensing Technical Report (Attachment 2) has been relocated to section 15. The comment has been addressed by adding Reference 40 to TVA to NRC letter dated February 25, 2011, Attachment 4 which is the "Common Q PAMS Regulatory Guide and IEEE Standard Analysis."		Reference 1 is the common Q topical report.				
203	7.5.1.	7.5.2	~~NCA~~	7/26/2010	Responder: Clark	192. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
204	7.5.1.	7.5.2	~~NCA~~	7/26/2010	Responder: Costley/Norman	193. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
205			~~CA~~	7/26/2010	Responder: Clark	194. Y	Closed	Closed	EICB RAI	TVA Letter dated	Question B related to prior NRC
206	7.5.1.	7.5.2	~~NCA~~	7/27/2010	Responder: Clark	195. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
207			~~CA~~	July 27, 2010	Date:	196. Y	Closed	Closed			
208	7.5.2.	7.5.1	~~NCA~~	7/27/2010	Responder: Clark	197. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
209	7.5.2.	7.5.1	~~NCA~~	7/27/2010	Responder: Clark	198. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
210	7.5.2.	7.5.1	~~NCA~~	7/27/2010	Responder: Clark	199. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
211	7.5.1.		~~CA~~	7/27/2010	Responder: Clark	200. Y	Closed	Closed	EICB RAI	TVA Letter dated	Relates to SE Sections:
212	7.5.2		EICB (Carte)	7/27/2010 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. (1) Please describe how the information provided demonstrates compliance with IEEE 603-1991 Clauses 5.5, 5.7, 5.10, & 6.5. (2) Please describe how the information provided demonstrates conformance with IEEE 7-4.3.2-2003 Clauses 5.5 & 57.	Responder: WEC Application specific requirements for testing. This cannot be addressed in a topical report. Evaluation of how the hardware meets the regulatory requirements. WEC to provide the information and determine where the information will be located. **IEEE-603 1991:** **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. **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	18. N	Open Partial Response included in letter dated 03/16/11 Final response due 3/29/11	Open-NRC Review **NNC 2/17/2011:** IEEE 603 Clause 5.5 basically states that conditions identified in IEEE 603 Clauses 4.7 & 4.8 must be addressed in the design. Energy supply conditions have not been identified, or explicitly addressed.	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
					Matrix" items: • 87 and 88 Seismic • 89, 90, 91, 92 and 185 EMI/RFI • 300, 301 and 302 Environmental Seismic qualification of the equipment to meet the design basis requirements **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: (1) appropriate justification shall be provided (for example, demonstration that no practical design exists), (2) acceptable reliability of equipment operation shall be otherwise demonstrated, and (3) the capability shall be provided while the generating station is shut down. **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: • 202 self test • 350 Maintenance Bypass • 351 Loop Tuning Parameters, • 400 and 401 3.7.2 Testing, Calibration, and Verification • 402, 403 and 404, 3.7.3 Channel Bypass or Removal from Operation **5.10 Repair.** The safety systems shall be designed to facilitate timely recognition, location, replacement, repair, and adjustment of malfunctioning equipment. **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: • 179 Mean time to repair • 202 self test • 398 3.7 Maintenance • 399 3.7.1 Troubleshooting			**NNC 2/18/11:** Clause 5.7 is acceptably addressed. **NNC 2/18/2011:** WNA-AR-00189-WBT Rev. 0 Table 5-2 shows a MTTR of 7.2 hours. It is not clear how this satisfies the contractual item No. 179. The Contract Compliance Matrix Item 179 in Revision 3 of the LTR has been revised to show this item as a deviaition and to reflect TVA's acceptance of the 7.2 hour MTTR value. Attachment 2 contains WNA-LI-00058-WBT-P, "Post-Accident Monitoring			

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
					6.5 Capability for Testing and Calibration **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: (1) by perturbing the monitored variable, (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 (3) by cross-checking between channels that bear a known relationship to each other and that have readouts available. **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: (1) Checking the operational availability of sensors by use of the methods described in 6.5.1. (2) Specifying equipment that is stable and retains its calibration during the post-accident time period. **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: • 10, display of sensor diagnostic information • 202 self test • 205 self diagnostics and watchdog timer • 264 through 271, system self checks • 311 system status displays, • 341 alarms, • 344 on-line diagnostics **IEEE 7-4.3.2-2003** **5.5 System integrity** 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: — Design for computer integrity — Design for test and calibration — Fault detection and self-diagnostics **5.5.1 Design for computer integrity** 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			System (PAMS) Licensing Technical Report," Revision 3, dated March 2011 (proprietary).			

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
					frequency fluctuations, and maximum credible number of coincident signal changes. 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. **TVA Response:** Common Q PAMS system reliability and failure modes are described in: • WNA-AR-00180-WBT, Revision 0, "Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System" • WNA-AR-00189-WBT, Revision 0 "Post Accident Monitoring System Reliability Analysis" 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. **5.5.2 Design for test and calibration** 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). 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. 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. 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. **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: • 202 self test • 350 Maintenance Bypass						

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
					• 351 Loop Tuning Parameters, • 400 and 401 3.7.2 Testing, Calibration, and Verification • 402, 403 and 404, 3.7.3 Channel Bypass or Removal from Operation **5.5.3 Fault detection and self-diagnostics** 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. 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. 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: — Memory functionality and integrity tests (e.g., PROM checksum and RAM tests) — Computer system instruction set (e.g., calculation tests) — Computer peripheral hardware tests (e.g., watchdog timers and keyboards) — Computer architecture support hardware (e.g., address lines and shared memory interfaces) — Communication link diagnostics (e.g., CRC checks) Infrequent communication link failures that do not result in a system failure or a lack of system functionality do not require reporting. When self-diagnostics are applied, the following self-diagnostic features shall be incorporated into the system design: a) Self-diagnostics during computer system startup b) Periodic self-diagnostics while the computer system is operating c) Self-diagnostic test failure reporting **TVA Response:** The requirements for fault detection and self diagnostics and Common Q PAMS system						

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
					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: • 107 error free download • 202 self test • 205 self diagnostics and watchdog timer • 263 primary and backup communication • 264 through 271, continuous on-line self checks • 311 system status displays, • 341 alarms, • 344 on-line diagnostics **5.7 Capability for test and calibration** No requirements beyond IEEE Std 603-1998 are necessary. **TVA Response:** No response required. 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 *(a)* Energy Supply conditions are specified in WNA-DS-01617-WBT-P, System Requirements Specification Rev. 4, Requirement 4.1-1 which requires 120Vac ±10% and 60±3Hz. Power to the Common Q PAMS is provided from the 120Vac vital power system. Per WBN Unit 2 FSAR section 8.3.1.1 the vital 120 volt ac system specifications are 120Vac ±2% and 60±0.5Hz. Based on this, the power provided meets the system requirements. Electromagnetic compatibility, seismic and environmental qualification of the equipment to meet the design basis requirements is documented in EQ-QR-68-WBT-P, Revision 0 "Qualification Summary Report for Post-Accident Monitoring System (PAMS)" (Proprietary) (Attachment 4). Attachment 5 contains EQ-QR-68-WBT-NP, Revision 0 "Qualification Summary Report for Post-Accident Monitoring System (PAMS)" (non-proprietary). Attachment 6 contains CWA-11-3118, Application for Withholding Proprietary Information from Public Disclosure, EQ-QR-68-WBT-P, Revision 0 "Qualification Summary Report for Post-Accident Monitoring System (PAMS)," (Proprietary), dated February 28, 2011. *(b)* The Contract Compliance Matrix Item 179 in Revision 3 of the Licensing Technical Report will be revised to show this item as a deviation and to reflect TVA's acceptance of the 7.2 hour MTTR value. WNA-LI-00058-WBT-P, "Post-Accident Monitoring System (PAMS) Licensing Technical Report," Revision 3, (proprietary) dated March 2011, will be submitted no later than March 29, 2011.						
213	7.5.2		CB (C art	7/27/2010	Responder: WEC	19. N	Open	Open-NRC Review	EICB RAI ML102980066 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
				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. (1) Please provide the design basis (as described in IEEE 604 Clause 4) of the Common Q PAMS. (2) Please provide a regulatory evaluation of how the PAMs complies with the applicable regulatory requirements for the theory of operation. For example: Regarding IEEE 603 Clause 5.8.4 (1) What are the manually controlled protective actions? (2) How do the documents identified demonstrate compliance with this clause?	Conformance with IEEE 603 is documented in the revised Common Q PAMS Licensing Technical Report and the Common Q PAMS System Design Specification. 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" 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. **TVA Response to Follow-up NRC Request:** The Regulatory Guide 1.97 classification of the Common Q PAMS variables is documented in TVA Design Criteria WB-DC-30-7 "Post Accident Monitoring Instrumentation" which was submitted as Attachment 5 on TVA to NRC letter "Watts Bar Nuclear Plant (WBN) Unit 2 – Instrumentation And Controls Staff Information Requests" dated June 18, 2010 (Reference 1) The hardware design bases for the Common Q PAMS is described in the WBN Unit 2 FSAR section 7.5.1.8 "Post Accident Monitoring System (PAMS)." The Common Q PAMS indications are used to support operator response to events described in chapter 15 of the WBN Unit 2 FSAR such as: • RCCA/RCCA Bank dropped/misaligned • Steam Generator Tube Rupture • Inadvertent Loading of a Fuel Assembly Into an Improper Position • Loss of Shutdown Power • Major Reactor Coolant System Pipe Ruptures (Loss Of Coolant Accident) • Major Secondary System Pipe Rupture		Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. Response is included in letter dated 10/25/10 NNC to review and revise this question after LTR R2 is received.	**Due 3/29/11** **NNC 2/3/11:** The identified documentation does not include the design bases. Please provide schedule for providing the requested information.	No. 18		
214			~C	7/27/2010	Responder: WEC	201. Y	Closed	Closed	EICB RAI	TVA Letter dated	
215			~P	7/29/2010	Responder: WEC	202. Y	Closed	Closed			
216	7.5.1.	7.5.2	~Na	7/29/2010	Responder: Clark	203. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
217			~Cg	7/6/2010	Responder: Clark	204. Y	Close	Closed	EICB RAI	TVA Letter dated	
218			~Cg	7/6/2010	Responder: Clark	205. Y	Closed	Closed	EICB RAI	TVA Letter dated	
219			~Cg	8/4/2010	Responder: TVA Licensing	206. Y	Closed	Closed	EICB RAI		
220			~Cg	8/4/2010	Responder: Ayala	207. Y	Closed	Closed	EICB RAI	TVA Letter dated	
221	7.7.1.	7.7.1.3	~Na	8/4/2010	Responder: Trelease	208. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
222			~Cg	8/4/2010	Responder: Clark	209. Y	Close	Closed	EICB RAI	TVA Letter dated	
223			~Cg	8/4/2010	Responder: Clark	210. Y	Closed	Closed	EICB RAI		
224	7.5.1.	7.5.2	~Na	8/4/2010	Responder: Norman (TVA CEG)	211. Y	Closed	**Closed**	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
225			~Cg	8/4/2010	Responder: Scansen	212. Y	Close	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
226			C	8/4/2010	Responder: TVA Licensing	213. Y	Closed	Closed	N/A – Information	TVA Letter dated	See also Open Item Nos. 41 & 270.
227			C	8/4/2010	Responder: Clark	214. Y	Close	Closed	EICB RAI	TVA Letter dated	
228			C	8/4/2010	Responder: Clark	215. Y	Closed	Closed	EICB RAI	TVA Letter dated	
229			C	8/4/2010	Responder: Clark	216. Y	Closed	Closed	EICB RAI	TVA Letter dated	
230			C	8/4/2010	Responder: Webb	217. Y	Closed	Closed	EICB RAI	TVA Letter dated	
231			C	8/4/2010	Responder: Clark	218. Y	Closed	Closed	EICB RAI	TVA Letter dated	
232			S	8/4/2010	Responder: Clark	219. Y	Closed	Closed	RAI No. 5	TVA Letter dated	
233			C	8/4/2010	Responder: Clark	220. Y	Closed	Closed	EICB RAI	TVA Letter dated	
234			C	8/4/2010	Responder:	221. Y	Closed	Closed	N/A – Duplicate	N/A	
235			C	8/4/2010	Responder: TVA Licensing	222. Y	Closed	Closed	N/A	N/A	
236			C	8/4/2010	Responder: Clark	223. Y	Close	Closed	EICB RAI	TVA Letter dated	
237			C	8/4/2010	Responder: Clark	224. Y	Closed	Closed	EICB RAI	TVA Letter dated	
238			C	8/4/2010	Responder: Webb/Hilmes	225. Y	Closed	Closed	N/A – Duplicate	N/A	
239			C	8/4/2010	Responder: Hilmes	226. Y	Closed	Closed	N/A – Meeting	N/A	
240			C	8/4/2010	Responder: Clark	227. Y	Close	Closed	MI102910008	TVA Letter dated	
241			S	8/4/2010	Responder: Davies	228. Y	Closed	Closed	RAI No. 10	TVA Letter dated	
242			C	8/4/2010	Responder: Hilmes	229. Y	Close	Closed	EICB RAI	TVA Letter dated	
243			C	8/3/2010	Responder: WEC	230. Y	Closed	Closed	N/A – Closed to	N/A	
244			EICB (Carte)	8/3/2010 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. 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. Please explain how the above meets the intent of the approved SPM.	Responder: WEC The process related requirements have been removed from revision 2 of the Software Requirements Specification (SRS). 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. **TVA Response to Follow-up NRC Request:** As shown is the listed documents, process related requirements have been deleted from the SRS and SysRS in Revision 3: Attachment 1 contains proprietary version of WNA-DS-01617-WBT-P, Revision 3, "Post Accident Monitoring System-System Requirements Specification," dated December 2010. 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. Source: E-mail from Westinghouse (Andrew P. Drake) to Bechtel (Mark S. Clark), RE: Common Q RAI concerns, dated December 8, 2010 (Reference 17) **TVA Response to Follow-up NRC Request:**	20. N	Open Revised response is included in letter dated 12/22/10 Response is provided in letter dated 10/25/10. **NNC 11/18/10:** SysRS Rev. 2 also contains process requirements that are more appropriately incorporated into process documentation.	Open-NRC Review **Due 2/25/11** Document revisions **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." 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
					The documents discussed in Item 3 have been revised to address compliance with the Topical Report (TR) and the Software Program Manual (SPM).						
245			EICB (Carte)	8/3/2010 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 Relates to the commitment to provide the test plan and the SPM compliance matrix Attachment 9 contains the Westinghouse document "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 "Post Accident Monitoring System Test Plan," WNA-PT-00138-WBT, Revision 0, dated November 2010. **TVA Response to Follow-up NRC Request:** The results of the self assessment were reviewed by Westinghouse with the NRC on February 2, 2011 and were further reviewed by TVA during the NRC Common Q PAMS audit during the week of February 28 to March 4, 2011. Corrections to WNA-TR-02451-WBT, "Test Summary Report for the Post Accident Monitoring System" and the self assessment were made as a result of the TVA review to ensure this comment was fully addressed. By agreement between TVA, WEC and the NRC, the Post Accident Monitoring System Test Plan, WNA-PT-00138-WBT, Revision 0 will not be revised. Instead a non-proprietary Common Q PAMS Test Summary Report will be developed and submitted to address the issues with TR and SPM compliance. Attachment 1 contains non-proprietary WNA-TR-02451-WBT, Revision 0, "Test Summary Report for the Post Accident Monitoring System," dated March 2011.	21. N	Open Pending Submittal of the Test Summary Report due 3/29/11 Response included in letter dated 12/3/10 Common Q PAMS Test Summary Report scheduled to be submitted March 29, 2011.	Open-NRC Review **Due 3/29/11** **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. 119		LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence." 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."
246			EICB (Carte)	8/3/2010 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 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. 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" **TVA Response to Follow-up NRC Request:** The results of the Common Q TR and SPM self assessment were reviewed by Westinghouse with the NRC on February 2, 2011. The Westinghouse Watts Bar Unit 2 NSSS Completion I&C Projects Project Quality Plan, WNA-PQ-00220-WBT, Revision 1 is available for NRC audit at the Westinghouse	22. N	Open Pending Submittal of Revision 3 of the Licensing Technical Report due 3/29/11. PQP provided for audit the week of 2/28/11. Response is provided in letter dated 10/25/10 **NNC 11/18/10:** PQP has not been provided and CQ PAMS LTR Rev. 1 does not contain comparable information.	Open-NRC Review **Due 3/29/11** **NNC 2/2/11:** Issues with the Common Q TR & SPM implementation 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." 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."

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					Rockville Office and was available for review during the NRC Common Q PAMS audit during the week of February 28 to March 4, 2011. During the audit, the Westinghouse Quality Assurance in process audit of the Common Q PAMS project was reviewed by the NRC inspector with no issues identified.						
247			— C C	8/8/2010	Responder: WEC	231. Y	Closed	Closed	EICB RAI	Response is	LIC-101 Rev. 3 Appendix B Section 4,
248			— C C	8/8/2010	Responder: WEC	232. Y	Closed	Closed		Response is	LIC-101 Rev. 3 Appendix B Section 4,
249			— C C	8/8/2010	Responder: WEC	233. Y	Closed	Closed			LIC-101 Rev. 3 Appendix B Section 4,
250			EICB (Carte)	8/8/2010 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 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. **TVA Response to Follow-up NRC Request:** The following documentation shows that the configuration management tasks for that activity group have been successfully accomplished. 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: a. Section 2.2.1 Hardware/Software Change Process has been added to describe the process of how changes are evaluated. 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. 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).	23. N	Open Revised response included in letter dated 12/22/10 Response included in letter dated 10/25/10.	Open-NRC Review **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." 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 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 The software testing performed and documents created are addressed by the SPM Compliance matrix contained in Revision 1 of the Licensing Technical Report. 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" **TVA Response to Follow-up NRC Request:**	24. N	Open Pending Submittal of the Test Summary Report due 3/29/11 Revised response included in letter dated 12/22/10 Partial response is provided in letter dated 10/25/10	Open-NRC Review **Due 3/29/11** **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			LIC-101 Rev. 3 Appendix B Section 4, "Safety Evaluation" states: "the information relied upon in the SE must be docketed correspondence." 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."

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					Please see the response to RAI item 21 in letter dated 12/22/10, NRC Matrix Item 250. **TVA Response to second Follow-up NRC Request:** The results of the Common Q TR and SPM self assessment were reviewed by Westinghouse with the NRC on February 2, 2011. By agreement between TVA, WEC and the NRC, the Post Accident Monitoring System Test Plan, WNA-PT-00138-WBT, Revision 0 will not be revised. Instead a non-proprietary Common Q PAMS Test Summary Report will be developed and submitted to address the issues with TR and SPM compliance. Attachment 1 contains non-proprietary WNA-TR-02451-WBT, Revision 0, "Test Summary Report for the Post Accident Monitoring System," dated March 2011.						
252			EICB (Carte)	8/8/2010 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 Explain response to AP1000 audit report. RTM docketed NRC awaiting V&V evaluation of RTM. The following responses are based on WBN Unit 2 Common Q PAMS traceability: Software requirements traceability analysis is described in the following documents: 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" 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) 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. The V&V evaluation of the RTM is documented in section 2.2.2 of the following documents: 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	25. N	Open Response included in letter dated 12/22/10 Read ML091560352	Open-NRC Review Due 2/25/11 (document submittals) **NNC 2/2/11**: Updated RTMs and specifications to be provided. 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." 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
					November 2010), submitted in TVA Letter to NRC dated December 3, 2010 (Reference 1). 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). 3. The integration phase is covered in Attachment 10, 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 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. **TVA Response to Follow-up NRC Request:** See Response to item 3 (Matrix Item Number 142)						
253			C	8/8/2010	Responder: Clark	234. Y	Closed	Closed		TVA Letter dated	Related to Open Item no. 83.
254			C	8/10/2010	Responder: WEC	235. Y	Closed	Closed	N/A - Request to	TVA Letter dated	
255			C	8/10/2010	Responder: WEC	236. Y	Closed	Closed	N/A - Request to	TVA Letter dated	
256			C	8/10/2010	Responder: WEC	237. Y	Closed	Closed	N/A - Request to	TVA Letter dated	
257			C	8/10/2010	Responder: WEC	238. Y	Closed	Closed	N/A - Request to	N/A	
258			C	8/10/2010	Responder: WEC	239. Y	Closed	Closed	N/A - Request to	N/A	
259			C	8/10/2010	Responder: WEC	240. Y	Closed	Closed	N/A - Request to	TVA Letter dated	
260			C	8/10/2010	Responder: WEC	241. Y	Closed	Closed	N/A - Request to	N/A	
261			C	8/10/2010	Responder: WEC	242. Y	Closed	Closed	N/A – Closed to	TVA Letter dated	LIC-110 Rev. 1 Section 6.2.2 states:
262			C	8/10/2010	Responder: WEC	243. Y	Closed	Closed	N/A - Request to	N/A	
263			C	8/11/2010	Responder: WEC	244. Y	Closed	Closed	ML101650255, Item		
264			C	8/11/2010	Responder: WEC	245. Y	Closed	Closed	ML101650255, Item		
265			C	8/11/2010	Responder: WEC	246. Y	Closed	Closed	ML101650255, Item		
266			C	8/11/2010	Responder: Webb/Webber	247. Y	Closed	Closed		TVA Letter dated	
267			C	8/11/2010	Responder: WEC	248. Y	Closed	Closed			
268			C	8/19/2010	Responder: WEC	249. N	Closed	Closed			
269			P	8/20/2010	Responder: NRC	250. Y	Closed	Closed	N/A	N/A	
270			C	8/23/2010	Responder: Clark	251. Y	Closed	Closed			See also Open Item Nod. 41 & 245.
271			C	8/23/2010	Responder: WEC	252. Y	Closed	Closed	N/A – Closed to	NA	
272	7.5.2.	7.5.1	NRC	8/26/2010	Responder: Clark	253. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
273	7.5.2.	7.5.1	NRC	8/26/2010	Responder: Clark	254. 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
274.	7.5.2.	7.5.1	New	8/26/2010	Responder: Clark	255. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
274.			Sta	8/26/2010	Responder: Stockton	256. Y	Closed	Closed	RAI No. 6	TVA Letter dated	
275			Sta	8/27/2010	Responder: Clark	257. Y	Closed	Closed	Not Required	N/A	
276	7.6	7.6	Cog	8/27/2010	Responder: Webb	258. Y	Closed	Closed	EICB RAI	TVA Letter dated	
277	7.6	7.6.3	Cog	8/27/2010	Responder: Clark	259. Y	Close	Closed	EICB RAI	TVA Letter dated	
278	7.6	7.6.6	Cog	8/27/2010	Responder: Trelease	260. Y	Close	Closed	EICB RAI	TVA Letter dated	
279	7.6	7.6.6	Cog	8/27/2010	Responder: Mather	261. Y	Close	Closed	EICB RAI	TVA Letter dated	
280	7.6	7.6.6	Cog	8/27/2010	Responder: Trelease	262. Y	Closed	Closed	EICB RAI	TVA Letter dated	
281	7.6	7.6.8	Cog	8/27/2010	Responder: Webb	263.	Closed	Closed	EICB RAI	TVA Letter dated	
282	7.6	7.6.9	Cog	8/27/2010	Responder: Trelease	264. Y	Close	Closed	EICB RAI	TVA Letter dated	
283	7.7.5	XX	Dra	8/27/2010	Responder: Clark	265. Y	Closed	Closed	EICB RAI No.13	TVA Letter dated	This item is a follow-up question to item
284	7.7.3	7.4.1	Dra	8/27/2010	Responder: Webber	266. Y	Closed	Closed	EICB RAI No.14	TVA Letter dated	This item is a follow-up question to item
285	7.3.3	7.3	Dra	8/27/2010	Responder: McNeil	267. Y	Closed	Closed	EICB RAI No.15	TVA Letter dated	This item is a follow-up question to item
286	7.7.3	9.3.4.2.4	Dra	8/27/2010	Responder: Webber	268. Y	Closed	Closed	EICB RAI No.16	TVA Letter dated	
287	7.3	7.3-1	Dra	8/27/2010	Responder: Elton	269. Y	Closed	Closed	ML102390538, Item	Response	
288	7.3		Cog	9/2/2010	Responder: McNeil	270. Y	Closed	Closed	EICB RAI		
289			Csg	9/2/2010	Responder: Faulkner	271. Y	Closed	Closed	RAI No. 24	TVA Letter dated	
290		7.7	Cra	9/7/2010	Responder: Clark	272. Y	Closed	Closed	N/A	N/A	This item is a duplicate of item 291.
291		7.7	Cra	9/7/2010	Responder: Clark	273. Y	Closed	Closed		TVA Letter dated	
292	7.2.5	7.2	Cog	9/7/2010	Responder: Craig	274. Y	Closed	Closed	EICB RAI	TVA Letter dated	
293	7.7.4	7.2.2.3.5	New	9/8/2010	Responder: Craig	275. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
294	7.3	7.3.1.1.1	Dra	9/9/2010	Responder: Elton	276. Y	Closed	Closed	ML102390538, Item	Response	
295	7.3	7.3.1.1.2	Dra	9/9/2010	Responder: Elton	277. Y	Closed	Closed	ML102390538, Item	Response	
296	7.3	7.3.1.2.1	Dra	9/9/2010	Responder: Elton	278. Y	Closed	Closed	ML102390538, Item	Response	
297	7.3	7.3.1.2.2	Dra	9/9/2010	Responder: Elton	279. Y	Closed	Closed	ML102390538, Item	Response	
298	7.3	XX	Dra	9/9/2010	Responder: Clark	280. Y	Closed	Closed	ML102390538, Item	Response	
299			Cra	Provide Common Q Software Requirements Specification Post	Attachment 41 of the 10/5 letter contains the Common Q	281. Y	Closed	Closed		TVA Letter dated	
300			Sta	Need Radiation Monitoring System Description/Design Criteria	Responder: Temples/Mather	282. Y	Closed	Closed	RAI No. 25	TVA Letter	
301			Sta	1.TVA is requested to address the consequences of software	**Responder: WEC/Davies/Clark**	283. Y	Closed	Closed	RAI No. 11	TVA Letter dated	Note 1:
302	7.5.2.	7.5.1	New	09/17/2010	Responder: Tindell	284. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
303	7.5.2.	7.5.1	New	09/17/2010	Responder: Tindell	285. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
304	7.5.2.	7.5.1	New	09/17/2010	Responder: Tindell	286. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
305	7.5.2.	7.5.1	New	09/17/2010	Responder: Tindell	287. Y	Closed	Closed	EICB RAI	TVA Letter dated	EICB RAI ML102861885 sent to DORL
306	7.1	7.1	Cog	FSAR amendment 100, page 7.1-12 provides the definition of	Responder: Hilmes	288. Y	Closed	Closed	EICB RAI	TVA Letter dated	
307	7.1	7.1	Cog	(1) FSAR amendment 100, Section 7.1, page 7.1-12, definition of	Responder: Hilmes	289. Y	Closed	Closed	EICB RAI	TVA Letter dated	
308	7.1	7.1	Cog	(1) FSAR Amendment 100, Section 7.1, page 7.1-13, definition of	Responder: Hilmes	290. Y	Closed	Closed	EICB RAI	TVA Letter dated	
309	7.1	7.1.2.1.9	Cog	(1) FSAR amendment 100, Page 7.1-14, Westinghouse setpoint	Responder: Hilmes	291. Y	Closed	Closed	EICB RAI	TVA Letter dated	
310	7.1	7.1.2.1.9	Cog	(1) FSAR amendment 100, Page 7.1-14, TVA setpoint	Responder: Hilmes	292. Y	Closed	Closed	EICB RAI	TVA Letter dated	
311	7.1	7.1	Cog	Both Westinghouse and TVA setpoint methodology do not have	Responder: Hilmes	293. Y	Closed	Closed	EICB RAI	TVA Letter dated	
312		7.0	Cog	By letter dated September 10,2010, TVA provided the summary	Responder: Stockton	294. Y	Close	Closed	EICB RAI	TVA Letter dated	
313	7.7.8	7.7.1.12	Dra	EDCR 52408 (installation of AMSAC in Unit 2) states that Design	Responder: Ayala	295. Y	Closed	Closed	EICB RAI No.18	TVA Letter dated	
314	7.3	7.3	Dra	The following 50.59 changes were listed in the March 12 RAI	Responder: Stockton	296. Y	Closed	Closed	EICB RAI No. 19	TVA Letter dated	Related to OI 10
315	7.5.3	7.5.3	Cog	IE Bulletin 79-27 required that emergency operating procedures to	Responder: S. Smith (TVA Operations)	297. Y	Close	Closed	EICB RAI	TVA Letter dated	

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316	7.5.2.	7.5	EICB (Singh)	TVA has provided various documents in support of RM-1000 high	Responder: Temples/Mather	298. Y	Closed	Closed	RAI No. 26		
317	7.5.2.	7.5	EICB (Singh)	TVA has provided a proprietary and a non-proprietary version of	Responder: Temples	299. Y	Closed	Closed	RAI No. 27	TVA Letter dated	
318	7.5.2.3	7.5	EICB (Singh)	TVA has provided the following documents for RM-1000 equipment qualification: (i) Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter 04508905-QR (January 2001) (ii) Qualification Test Report Supplement, RM-1000 Upgrades 04508905-1SP (June 2006) (iii) Qualification Test Report Supplement, RM-1000 Upgrades 04508905-2SP (June 2008) (iv) Qualification Test Report Supplement, RM-1000 Upgrades 04508905-3SP (May 2008) Please clarify whether all of these are fully applicable to WBN2 or are they applicable with exceptions? If with exceptions, then please clarify what those are. Supplement 3 was issued one month prior to supplement 2. Please explain the reason for the same.	*Responder: Temples* *(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.* *(ii) Applicable to WBN Unit 2.* *(iii) Not applicable to WBN Unit 2* *(iv) Not applicable to WBN Unit 2* *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.* **TVA Response to Follow-up NRC Request:** **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). (1) The applicability of the qualification reports from GA-ESI e-mail dated December 10, 2010 (Reference 19) is as follows: 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. 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. c. 04508905-1SP is not applicable to the WBN Unit 2 I to F converter module. d. 04508905-2SP "Qualification Test Report Supplement, I-F Converter Upgrades" is	26. Y	Open Revised response is included in letter dated 12/22/10. **Note check 04508905-1QR or QR. Staff version is QR only.** Response is included in letter dated 10/29/10	Open-NRC Review Due 2/25/11 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. Check page numbers of Appendix F (missing/duplicate pages). Check applicability of Appendix C to RM1000 instead of RM2300? See items 336 and 337. 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. 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? Further update required Provide model number/part number for the RM-1000 and I/F	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
					applicable to the WBN Unit 2 I to F converter module. 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: 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 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. 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. (2) This is addressed by response to RAI Question 336 in TVA to NRC letter dated November 24, 2010 (Reference 8) (3) This is addressed by response to RAI Question 337 in TVA to NRC letter dated November 24, 2010 (Reference 8) (4) The 04508905-3SP Qualification Test Report Supplement, RM-1000 Upgrades" is not applicable to WBN Unit 2 (Reference 19).			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. Provide qualification reports 04038903-QSR and 04038903-7SP by the dues date of 1/22/11. Submit a copy of any other relevant reviewed versions of the qualification reports. Submit copies of the reviewed reports for 04508905-QR, 04508905-1SP, 04508905-2SP. 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
					Please see Item 1, above, for applicability of the other reports. (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. (6) See item 5. **<u>TVA Response to Follow-up NRC Request:</u>** The following documents are the qualification documents associated with the RM-1000 radiation monitors: Attachment 5 contains the approved proprietary version of General Atomics Electronic Systems 04508905-1SP, “Qualification Test Report Supplement, RM-1000 Upgrade.” • Attachment 6 contains the approved proprietary version of General Atomics Electronic Systems 04508905-2SP, “Qualification Test Report Supplement, I-F Converter Upgrades.” • 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).” • 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. • 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.	7.5	(S	TVA provided System Verification Test Results 04507007-1TR	Responder: Temples	300. Y	Closed	Closed	RAI No. 29	TVA Letter dated	
320			E I	Per Westinghouse letter WBT-D-2340, TENNESSEE VALLEY	Responder: Clark	301. Y	Closed	Closed	N/A	N/A	Duplicate of item 156
321			E I	For the purposes of measuring reactor coolant flow for Reactor	Responder: Clark	302. Y	Closed	Closed	N/A	N/A	Duplicate of OI# 157
322		7.7.1.11	(C	Section 7.7.1.11 will be added to FSAR Amendment 101 to provide	Responder: Clark	303. 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	Responder: Hilmes/Unit 1 Attachment 12 contains the WCAP 13869 Revision 1 to	1. Y	Open Due 3/29/11	Open-TVA/Bechtel Due:		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
				to the NRC by November 15, 2010	Revision 2 Change Analysis. **TVA Response to Follow-up NRC Request** A FSAR change will be submitted in a future FSAR amendment to change the revision level back to 1. **TVA Response to Second Follow-up NRC Request** The differences between the Revision 1 and Revision 2 WCAPs is documented in Attachment 12, "WCAP 13869 Revision 1 to Revision 2 Change Analysis", to TVA to NRC letter dated October 29, 2010 (Reference 2). The design bases for the response to feedwater break inside containment, as documented in Chapter 15 of the WBN Unit 2 FSAR, is the same for WBN Unit 1. Since WBN Unit 2 is required to match the WBN Unit 1 licensing basis to the extent practical, the decision was made to revise the WBN Unit 2 FSAR to agree with the WBN Unit 1 FSAR which uses Revision 1.		Revised Response is included in letter dated 10/29/10 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	Need to provide additional info on why Rev. 1 is acceptable for both units. 3/10/11 Staff does not agree with the statement that there is no technical differences between WCAP-13869 rev.1 and rev2., but staff agree that rev1 and change analysis could be basis for acceptance for both Watts Bar units. 4/6/11 TVA response is acceptable, however this item remains open until TVA makes changes to FSAR.		No. 36	
324				Per the NRC reviewer, the BISI calculation is not required to be		304. Y	Closed	Closed			
325				The Unit 2 loops in service for Unit 1 that are scheduled to be	Responder: TVA Startup Olson	305. Y	Closed	Closed			Closed to open item ?
326				TVA uses double-sided methodology for as-found and as-left	Responder: Webb	306. Y	Closed	Closed		TVA Letter dated	
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 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.	27. Y	Open Response Included in letter dated 11/24/10	Open-NRC Review Due 11/24/10			
328	7.5.2.	7.5		Provide the model number for the four containment high range	Responder: Temples	307. Y	Closed	Closed	RAI No. 30	TVA Letter dated	
329	7.6.1	7.6.7		Section 7.6.7 of the FSAR (Amendment 100) states that, "The	Responder: Clark	308. Y	Closed	Closed	RAI No. 1	TVA Letter dated	
330	7.3	7.3		Related to Item 298	Responder: Hilmes/Faulkner	309. Y	Closed	Closed	EICB RAI No.20	Item 7, TVA letter	
331	7.6.1	7.6.7		As a follow up of OI 190, Staff has reviewed the proprietary version	Responder: WEC/Harless/Clark	310. Y	Closed	Closed	RAI No. 8	TVA Letter dated	Follow-up of OI-190.
332	7.5.2.	7.5.1		10/26/2010		311. Y	Closed	Closed	ML103000105 Item	TBD	EICB RAI ML103000105 sent to DORL
333	7.5.2.	7.5.1		10/27/2010		312. Y	Closed	Closed	ML103000105 Item	TBD	EICB RAI ML103000105 sent to DORL
334	7	7		FSAR Figure 7A-3 "Mechanical Flow and Control Diagram	Responder: Stockton	313. Y	Closed	Closed	RAI not required.	N/A	RAI not required because the figure is
335	7.6.1	7.6.7		LPMS: Reference to OI-331, sub item 2.	Responder: WEC	314. Y	Closed	Closed	RAI# 1, EICB letter	TVA letter, dated	We need to confirm when MEEB when
336	7.5.2.	7.5		Re: RM-1000 Report 04508905-QR	Responder: GA	315. Y	Closed	Closed			
337	7.5.2.	7.5		Re: RM-1000 Report 04508905-QR	Responder: GA	316. Y	Closed	Closed			
338	7.5.2.	7.5		In page 3-15 and appendix B of Qualification Test Report	04508905-QR, "Qualification Test Report for RM-1000	317. Y	Closed	Closed	RAI #4 letter dated	FSAR amend 103	Note: Item to be added to Section 3.10
339	7.5.2.	7.5		In the Qualification Test Report 04508905-QR, the licensee	As agreed to with the reviewer, Attachment 1 contains the	318. Y	Closed	Closed	RAI #5 letter dated	FSAR amend 103	Note: Item to be added to Section 3.10
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 The following responses are based on e-mail: GA-ESI to Bechtel, dated December 8, 2010 (Reference 20), **(1)** The EMI/RFI tests described in Table 3-2 are based on	2. N	Open Due 4/30/11 Response included in letter dated 12/22/10.	Open-NRC Review Provide the qual reports by 1/28/11 per TVA letter of 12/22/10.			

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					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. **(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: a. ENV 50140 - Electromagnetic Compatibility - Basic Immunity Standard - Radiated Radio-Frequency Electromagnetic Field - Immunity Test b. EN 55011 - Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement c. EN 55022 - Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement **TVA Response to Follow-up NRC Request:** The total EMI/RFI testing of the RM-1000 and current-to-frequency converter is documented in the following reports: • Attachment 5 contains the proprietary version of General Atomics Electronic Systems 04508905-1SP, "Qualification Test Report Supplement, RM-1000 Upgrade." See sections 5.1.1, 5.1.2 and 5.1.4 for EMI/RFI. • Attachment 7 contains the proprietary version of General Atomics Electronic Systems 04038903-7SP, "Qualification Basis for 04034101 (2-RE-90-271, 272, 273 & 274)." See section 5 for EMC qualification basis. • 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." See section 3.4 for electromagnetic compatibility qualification requirements. • 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." See sections 3.2.1 through 3.2.5 and 6.2 for EMI/RFI.			Due: 2/25/11 Clarification Needed: Per 2/25/11 response TVA document SS-E18.14.01, Rev. 3 is the source document for all testing. Please provide this document for staff review. In addition British Standards (e.g. ENV 50140) have been cited in testing which are not per RG 1.180, R1. TVA to describe compliance of SS-E18-14.01 to RG 1.180 with justification for deviations. No test curves have been provided in any of the reports. As a minimum TVA to provide a few sample test curves or justify not supplying them. No EMI/RFI curves have been provided as yet. TVA to provide representative curves. NRC review proceeding in parallel. NRC current review guidance is based on compliance with RG 1.180 or equal with justification for variations. TVA is requested to provide the roadmap for compliance to RG 1.180 with justifications for any deviations. Simply following TVA standard specification SS E18.14.01, Rev. 3 is not sufficient.			

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
					Attachments 7 and 8 document the EMI/RFI testing specific to the WBN Unit 2 RM-1000 monitors and current-to-frequency converters. **TVA Response to Second Follow-up NRC Request:** GA-ESI qualification report 04038903-7SP, "Qualification Basis for 04034101 (2-RE-90-271, 272, 273 & 274)" Revision C dated February 22, 2011(Proprietary), submitted on TVA to NRC letter dated February 25, 2011 (Reference 2), section 5.1 states: "GA-ESI has performed the tests on a 2 channel RM-1000 radiation monitoring system the configuration of which is shown in GA-ESI drawing 04509000 System Installation Configuration, RFI/EMI Test, RM-1000 the results of which are issued in GA-ESI report 04038800, RM-1000 EMC Test Report, TVA and 04509050, RM-1000 EMC Test Report. The equipment tested used an RM-1000 microprocessor radiation monitor Display/Control NIM Bin Assembly, an I-F Converter, line filter, and an RD-23 detector. The monitor system being qualified is the same as the monitor system tested and includes ECO-17656 modifications to ensure EMC compliance." Attachment 1 contains the TVA "Browns Ferry High Range Radiation Monitor" which contains the requested EMI test curves. We have confirmed that the GA-ESI reports (04509050, "RM-1000 EMC Test Report," dated 4/22/03 and 04038800, RM-1000 EMC Test Report," dated 11/11/99) included in the TVA report are applicable to the WBN Unit 2 RM-1000 monitors. The non-proprietary versions and affidavit for withholding of GA-ESI reports (04509050 and 04038800) will be submitted within two weeks of receipt from GA-ESI. GA-ESI qualification report 04038903-7SP, section 5, provides a detailed discussion of the test results in GA-ESi report 04509050. **TVA Response to Follow-up NRC Request** Attachment 1 provides a comparision of the TVA EMC specification SS E18.14.01, Revision 3 requirements to RG 1.180 requirements.						
341	7.5.2.	7.5	– S	FSAR Tables 3.10 list seismically qualified equipment. However,	A review of WBN Unit 2 FSAR amendment 102 chapters	319. Y	Closed	Closed	RAI #1 letter dated	FSAR amend 103	
342	7.5.2.	7.5	– S	Please confirm that RM-1000 monitors and the associated	The RM-1000 containment high range radiation monitors are	320. Y	Closed	Closed			
343	7.5.2.	7.5	– S	Seismic RRS in the 04508905-QR report Figures 3-2 and 3-3	(1) The cause of the difference between the RRS and TRS	321. Y	Closed	Closed			
344	7.6.6	?	– C	Unit 1 SE discussed in Section 7.6.5, "Valve Power Lockout".	***(a)*** In accordance with0PDP-6, "Locked Valve/Breaker	322. Y	Close	Closed			Close based on TVA letter dated
345	7.5.2.	7.5	– S	Provide the normal temperatures and expected periods of high/low	RM-1000 in a NIM Bin was Tested at 39°F for 72 Hrs and	323. Y	Closed	Closed		Response	
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	3. N	Open Due 4/15/11	Open-NRC Reviewl Due: 2/25/11 The proposed response appears to be			

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 equipment specific qualification reports. **TVA Response to Follow up NRC Request:** Report 04507007-1TR "RM-1000 System Verification Test Results" is applicable to the WBN Unit 2 monitors. The applicability is that 04507007-1TR includes all test cases called out in the 04507006 "RM-1000 System Test Procedure Specification" and contains evidence that the V&V tests were performed with version 1.0 software code. The verification report for version 1.1 software is document 04508005 "RM-1000 Software Version 1.1 Software Verification Report." Document 04508006 "RM-1000 Version 1.2 Software Verification and Validation Report" shows that the required test was completed to validated version 1.2 code for the RM-1000. The Engineering reviewed and approved proprietary versions of 04507007-1TR, 04508005 and 04508006 will be submitted within two weeks of receipt from GA-ESI. The unreviewed proprietary versions, non-proprietary versions and affidavit for withholding were submitted on TVA to NRC letter July 15, 2010 (Reference 3). **TVA Response to Follow up NRC Request** GA-ESI has a single process for buying material, assembling and testing modules. The same process is used for any part number, safety related or not so they can avoid having to store the same part number in two different locations and avoid the possibility of mixing them up. Therefore, the Sorrento Electronics "safety-related" production modules and the Sequoyah "non-safety-related" modules are physically identical. Based on the above the report is acceptable.			conflicting with the proposed response for OI-351 regarding not submitting the 04508905-QR report. TVA to re-assess proposed response for both OIs. TVA to re-evaluate previous responses to OI-316 and OI-319 which have conflicting responses regarding the applicability of 04507007-1TR. **NRC Follow-up question** Report 04507007-1TR, 1999 states in the Test Summary that "Initially the testing was done using the SE safety related production modules that had undergone software V&V testing. The majority of the testing was done by using two of the Sequoyah non-safety related production modules for the TVA contract, substituted for the SE modules." Since the report is based on primarily non safety related components TVA to clarify and justify why NRC should accept this test report for safety related V&V testing.			
347	7.5.2.	7.5	~ S	Qualification report 04508905-1SP does not address EMI/RFI	Qualification report 04038903-7SP, Qualification Basis for	324. Y	Closed	Closed			
348	7.5.2.	7.5	~ S	Qualification report 04508905-2SP does not address EMI/RFI	Qualification report 04038903-7SP, Qualification Basis for	325. Y	Closed	Closed			
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	The design criteria provides the criteria for determining 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 3.5x10^2 RAD and a maximum integrated accident dose of 710.5 RAD for a maximum TID of 1060.5 RAD. The accident dose of 710.5 RAD is the dose for a 100 day	1. Y	Open	Open-Mech Eng to revise calculation Due: 2/25/11 TVA to provide the assessment document or a summary of the document with the reference to 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
				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.	LOCA at the surface of the HEPA filter in the Mechanical Equipment Room. This is documented in TVA calculation WBNTSR-005, "Dose Due to the Control Building Emergency Air Cleanup Filters" Revision 3. However, on page 25 of WBNTSR-005, the shine from this source into the control room is negligible and is not considered in the dose calculation for the control room. Calculation WBNAPS3-126, "EQ Dose in the U1/U2 Auxiliary Instrument Rooms and the Computer Room in the Control Building" Revision 0 documents the environmental qualification (EQ) radiation dose in the control building. A review of this document by the TVA radiation protection engineer determined that the TID including the normal and accident dose values for the control room is less than 1x10^3 RAD. Calculation WBNAPS3-126, will be revised to include the control room by July 1, 2011. Since the control room TID has been determined to be less than 1x10^3 RAD, radiation qualification of the RM-1000.			appropriate document/documents. February 25, 2011 response is acceptable. Item will be tracked as a confirmatory item in the SE. TVA to provide calculation or summary of calculation when complete.			
350	7.5.2.	7.5	EICB (Singh)	The seismic required response spectra (RRS) is shown in Figures	The RM-1000 was seismically tested in a NIM Bin and the	326. Y	Closed	Closed	RAI # 9, letter	FSAR amend 103	Note: Item to be added to Section 3.10
351	7.5.2.	7.5	EICB (Singh)	The replacement schedule for the components that have a	The replacement schedules stated in 04508905-1SP,	327. Y	Closed	Closed			
352	7.5.2.	7.5	EICB (Singh)	Please clarify how many RM-1000 radiation monitors are being	The total number of RM-1000 units procured under MR	328. Y	Closed	Closed			
353	7.5.2. 3	7.5	EICB (Singh)	Please provide a summary of the [manufacturer's] commercial dedication plan for radiation monitors with references to the guidance document that it follows. Also please include different facets (e.g. receiving, inspection, testing etc.) of the plan.	GA-ESI submitted their commercial grade dedication procedure (OP-7.3-240, "Safety-Related Commercial Grade Item Parts Acceptance," Revision H) to engineering for review. Engineering review of the procedure found that the procedure, Section 5, did not require multiple dedication methods for complex CGI or CGI used in digital safety systems. As a result, it was determined that the GA-ESI program did not meet the requirements of NUREG-800, Section 7.0A, Revision 5. A discussion with GA-ESI found that while not required by procedure, GA-ESI does perform vendor surveys as required by Method 2 of NP-5652. The surveys are done based on prudent business practices. Based on this discussion, GA-ESI agreed to review the CGI used in the WBN Unit 2 digital safety-related monitors to determine if they had been dedicated by more than one method. The review of the CGI used in the WBN Unit 2 digital safety-related monitors determined that all CGI had been dedicated using Method 1 of EPRI guideline NP-5652. However, in the sample of items reviewed, there were CGI that were dedicated using a single method. Based on the results of the engineering procedure review and the results of the GA-ESI CGI review, Service Request 346896 was initiated to document the condition and to place the monitors in "Conditional Release" status. Based on the results of the previous reviews, GA-ESI agreed to the following plan of action to resolve the CGD issue: 1. GA-ESI shall revise its commercial grade dedication procedure (OP-7.3-240) to require multiple dedication methods be utilized for complex commercial grade items and commercial grade items for digital safety	4. N	Open Due 4/15/11	Open-NRC Review TVA to note that staff has written a safety evaluation and accepted EPRI TR-106439 (1996) as an acceptable method of addressing commercial dedication. EPRI NP-5652 must be used in conjunction with the additional guidance in EPRI TR-106439 for commercial dedication processes e.g. EPRI NP-6404, EPRI TR-102260, GL 89-02, and GL-91-05 per Section 3.3 of EPRI TR-106439. **Follow-up clarification:** TVA to review and satisfy itself with the procedure and provide NRC a copy of the procedure for review. In addition, TVA and GA to provide information as to what additional measures were taken by GA with			

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					class systems. The evidence that this has been completed will be provided to TVA by April 15, 2011. Specifically, Method 1 and at least one additional method from the list below will be used to ensure that the CGD procedure complies with the current SRP. Method 1 - Special Tests and Inspections Method 2 - Commercial Grade Survey of Supplier Method 3 - Source Verification Method 4 - Acceptable Supplier/Item Performance Record 2. GA-ESI shall take actions consistent with the revised operating procedure to address the CGIs used in the WBN Unit 2 safety-related digital monitors. Evidence that those actions have been completed will be provided no later than September 1, 2011. Based on the above action plan, TVA will resolve the issues with the GA-ESI CGD of CGI used in the WBN Unit 2 monitors and submit documentation of the resolution to the NRC by: • GA-ESI procedure OP-7.3-240 revision: April 30, 2011 • Resolution of CGD of CGI used in WBN Unit 2 RM-1000 monitors: September 15, 2011 **TVA Response to Follow up NRC Request** (1) TVA has reviewed the revised GA-ESI procedure and determined that changes bring the CGD program into conformance with the requirements of NUREG-800, Section 7.0A, Revision 5 EPRI topical report TR-106439 and EPRI guideline NP-5652. Attachment 2 contains GA-ESI procedure OP-7.3-240 "Safety-Related Commercial Grade Item Parts Acceptance," Revision I. (2) As stated in TVA to NRC letter dated April 15, 2011(Reference 1), Attachment 4, List of New Commitment Items, item 2, the due date for resolution of this issue is September 15, 2011.			available documentation to prove that more than one method was followed for commercial dedication.			
354	7.5.2.	7.5	~ S	RG 1.180 endorsed the guidance of IEEE-1050-1996 with	*(1)* The WBN Unit 2 grounding system design is in	329. Y	Closed	Closed			The grounding specification used by
355	7.5.2.	7.5	~ S	Staff has not found the stated exclusion zone for EMI/RFI	Cautions and distance limitations for WBN Unit 1 legacy	330. Y	Closed	Closed			
356	7.5.2.	7.5	~ S	The attachment number refers to your February 25, 2011 letter.	The loss of the RM-3 output (current to frequency (I/F)	331. Y	Closed	Closed		Closed by TVA	
357	7.5.2. 3	7.5	EICB (Singh)	In Attachment 5, Qualification Test Report Supplement, RM-1000 (04508905-1SP), Attachment 6, Qualification Test Report Supplement, I-F Converter Upgrade (04508905-2SP), and Attachment 23, Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter (04508905-QR), the applicant made a statement that the results for these tests are provided in SE document 04508903-1TR. Please provide SE document 04508903-1TR for the staff to review. IF this report has been submitted earlier then please advise us the letter number and date by which it was submitted.	Attachment 8 contains GA-ESI qualification report 04508903-1TR "Seismic Qualification Test Results RM-1000 and Current-to Frequency (I/F) Converter" original release, dated April 1999.	28. N		Open-NRC Review			
358	7.5.2.	7.5	~ S	The attachment numbers refer to your February 25, 2011 letter. In	An incomplete response was inadvertently submitted in TVA	29. N	Open	Open-NRC Review			

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	3			Attachment 2, "Wyle Test Report 41991 Safety Shutdown Earthquake (SSE) Test Response Spectra (TRS) Plots" all five (5) pages, in Attachment 5, "General Atomics Electronic Systems 04508905-1SP", page 5-5, Figure 5-2, and in Attachment 23, Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter (04508905-QR)", page 4-25, Figure 4-5 X-Axis SSE Test Response Spectra (TRS) versus Required Response Spectra (RRS), it shows that the TRS were below the RRS at various frequency (5% Damping). Please provide an explanation regarding why this is acceptable.	to NRC letter dated March 31, 2011 (Reference 1). The following response supersedes the previous response in its entirety. 1. *Attachment 2, "Wyle Test Report 41991 Safety Shutdown Earthquake (SSE) Test Response Spectra (TRS) Plots" all five (5) pages. These five Test Response Spectra (TRS) Plots versus Required Response Spectra (RRS) show that the TRS were below the RRS at various frequency (5% Damping). Please provide an explanation regarding why this is acceptable.* Attachment 2 of this letter provides five pages from the first seismic test (Wyle Test report 41991) from GA-ESI report 04508903-1TR, submitted in response to OI-357 on TVA to NRC letter dated March 31, 2011 (Reference 1). The following discussion refers to these pages. Wyle test report 41991 provided the seismic test results for two RM-1000 monitors (one area monitor and one process monitor) and one I/F converter. During the test, the RM-1000 monitor configured as an area monitor was damaged due to the test table impacting its mechanical stop (see page 4 of Wyle Test Report 41991 attached). This first test was completed for the RM-1000 monitor configured as a process monitor and the I/F converter. A second seismic test for the RM-1000 monitor configured as an area monitor and two I/F converters (Wyle Test Report 41991-1) is also included in 04508903-1TR. The RM-1000 monitor used in this second test was the same RM-1000 process monitor used in the first seismic test reconfigured (switch in application type 1 mode) as an area monitor. One of the I/F converters tested was the same I/F converter tested in the first seismic test. This second test was performed to complete the testing which could not be performed during the first seismic test due to the damage to the RM-1000 area monitor and the loss of the high voltage power supply to the I/F converter that occurred during the first seismic test. None of the TRS plots in this second seismic test report 41991-1 were below the RRS. General Atomics "Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter" (04508905-QR) refers to both Wyle Reports 41991 and 41991-1 included in report 04508903-1TR. It is recognized that the five TRS Plots versus the RRS where the TRS were below the RRS is an exceedance that must be justified. From Wyle report 41991 it can be determined that these five TRS versus RRS plots are for the seismic response in the front to back panel direction. The RRS used in the Wyle test reports envelopes the TVA standard RRS shown in Fig 3.1 of TVA Standard Specification CEB-SS-5.10, "For Seismic Qualification of Electrical, Mechanical and I&C Devices," submitted on TVA to NRC letter dated February 25, 2011, (Reference		Due 4/15/11				

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					2) below 33 Hz. This TVA standard RRS conservatively envelopes the in panel seismic demand for most TVA applications. For specific cases when required the actual in panel RRS can be developed. Calculation WCG-ACQ-0766, "In-Cabinet Required Response Spectra for RM-1000 Radiation Monitors in MCR Panel 2-M-30," Revision 0, (Attachment 3) has been issued to generate the 5% RRS for these safety related RM-1000 monitors, I/F converters and NIM bins for the WBN2 panel (2-M-30) where they will be installed. As can be seen from the RRS plots in calculation WCG-ACQ-0766 the front to back 5% RRS broad band peak is 9.76 g which is lower than the front to back 5% TRS shown in the subject five (5) plots. 2. *Attachment 5, "General Atomics Electronic Systems 04508905-1SP," page 5-5, Figure 5-2. The Figure 5-2 Test Response Spectra (TRS) Plots versus Required Response Spectra (RRS) shows the TRS to be below the RRS at various frequency (5% Damping). Please provide an explanation regarding why this is acceptable.* The display module for the RM-1000 monitors procured for WBN2 differs from that used in previous RM-1000 qualification tests. The seismic qualification basis for the WBN2 display module is established by similarity to the display module used in RM-2000 monitor qualification tests shown on page 5-4 and 5-5 of 04508905-1SP (pages attached). The basis for the similarity discussion is provided on pages 5-2 and 5-3 of 04508905-1SP. The TRS non-exceedance at approximately 6-7 Hz shown on page 5-5 is not applicable to WBN2 since the RRS shown on that figure is not used for WBN2 qualification. The correct comparison for WBN2 would be the TVA standard RRS shown in Fig 3.1 of CEB-SS-5.10 for 5% damping. The TRS shown on page 5-5 meets or exceeds all points of the TVA standard RRS. Therefore, the seismic qualification of the WBN2 display module is provided by pages 5-4 and 5-5 for which the TRS completely envelopes the TVA standard RRS shown in Fig 3.1 of CEB-SS-5.10. Additionally, as previously stated, Calculation WCG-ACQ-0766 was issued to generate the 5% RRS for the WBN2 panel (2-M-30) where the safety related RM-1000 monitors will be installed. The vertical 5% RRS plot in calculation WCG-ACQ-0766 broad band peak is 4.2 g which is lower than the 5% TRS shown in 04508905-1SP", page 5-5, Figure 5-2. 3. *Attachment 23, Qualification Test Report for RM-1000 Processor Module and Current-To-Frequency Converter (04508905-QR)", page 4-25, Figure 4-5 X-Axis SSE Test Response Spectra (TRS) versus Required Response Spectra (RRS) shows the TRS to be below the RRS at various frequency (5% Damping). Please provide an explanation regarding why this is acceptable.* This Figure 4-5 is one of the same figures identified in item 1. See item 1. for the appropriate discussion.						

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359	7.7.1.1		EICB (Carte)	Was the CERPI system developed under a 10 CFR 50 Appendix B compliant program?	CERPI is a non-safety related system. Therefore, 10 CFR 50 Appendix B is not applicable.	30.	Open Due 4/15/11	Open-NRC Review			
360			EICB (Garg)	In order for staff to review the acceptability of the Incore Instrumentation System (IIS): *(a)* Provide a brief system description of IIS and its regulatory compliance. In your discussion include the discussion of WINCISE and BEACON system which are part of the IIS. Also provide the differences between the system used at WBN Unit vs. at Unit 2, e.g. Movable vs. fixed IIS. For WINCISE provide the basis for acceptance. *(b)* If this system has been accepted by the staff previously at some other plant then provide the reference to that SE. Identify the document that describes the functionally of the IIS that is identical to the IIS used in the Westinghouse AP1000 reactor design. *(c)* If this has not been evaluated by the staff previously, then provide the effect of CCF of this system and its effect on safety system or chapter 15 analysis. *(d)* Does this have any interconnection with safety system? *(e)* For BEACON provide the acceptability of this system. I believe that this system was accepted at WBN Unit 1. If that is the case then provide the reference to that review. Also provide any differences of this system to the one at WBN Unit 1 system. *(f)* Please provide detailed information about the In-core Instrumentation System (IIS) to be installed in Watts Bar Unit 2. This information should indicate how the system meets the requirements established in the Standard Review Plan, including system concept, system requirements, system design, and system development, as well as the regulatory requirements identified for Watts Bar Unit 2. *(g)* Please provide a description on how the system will meet the regulatory requirements identified in Table 7.1-1 of the SRP, applicable to the IIS. *(h)* Provide detailed description about the connection and communication for the signals to be transmitted from the Core Exit Thermocouples to the Common Q Post Accident Monitoring System (PAMS). Also, describe how this communication will meet the NRC communications regulatory requirements. *(i)* Please provide the following Westinghouse document: NO-WBT-002, "Westinghouse Incore Information Surveillance & Engineering (WINCISE™) System Technical Manual." *(j)* Provide the failure modes and effects analyses for the IIS, documented in calculation WBNOSG4220 "WB Incore	*(a)* The Watts Bar Unit 2 In-core Instrumentation System (IIS) replaces all of the functionality provided by the Movable Incore Detector System (MIDS) used at Watts Bar Unit 1. The IIS to be used at Watts Bar Unit 2 is a Westinghouse IN-Core Information, Surveillance, and Engineering (WINCISE) System that is functionally described in Section 7.7.1.9 of the Watts Bar Unit 2 Final Safety Analysis Report (FSAR). The WINCISE-style IIS used at Watts Bar Unit 2 is essentially the same as the in-core power distribution measurement systems used at most Combustion Engineering style of operating reactors that use a type of in-core neutron sensors commonly called "Fixed In-core Detectors (FID)." The Watts Bar Unit 2 IIS is functionally identical to the IIS used in the Westinghouse [1]AP1000™ reactor design. The Watts Bar Unit 2 IIS includes the FIDs, Core Exit Thermocouples (CET), FID and CET signal cables, the FID signal processing hardware, and the FID signal processing software. This hardware and software is required to provide the measured signals to the associated BEACON System to periodically determine whether the reactor is operating within design core peaking factor limits. A detailed description of the Watts Bar Unit 2 IIS hardware is provided in the document titled, "Westinghouse Incore Information Surveillance & Engineering (WINCISE) System Technical Manual," NO-WBT-002, Revision 0 supplied by Westinghouse to TVA in September of 2010. The qualification for the BEACON System to perform the core power distribution measurement function using the Watts Bar Unit 2 WINCISE style IIS instrumentation is documented in the generic NRC Safety Evaluation Reports (SER) provided with WCAP-12472-P-A, "BEACON Core Monitoring and Operations Support System", Addendum I-A and Addendum 2-A. *(b)* The WINCISE style IIS used at Watts Bar Unit 2 is essentially the same as the in-core power distribution measurement systems used at all Combustion Engineering style of operating reactors that use a type of in-core neutron sensors commonly called "Fixed In-core Detectors (FID)." The Watts Bar Unit 2 IIS is functionally identical to the IIS described in the Westinghouse AP1000 design documents and approved in the Westinghouse AP1000 SER section 7.5.7 as documented in Westinghouse Letter WBT-D-____ , "title," dated April 14, 2011 (Attachment 7) *(c)* The digital in-core flux monitoring portion of the IIS is non-safety-related. As such, CCF analysis is not required by NUREG-800 section 7.0-A. The IIS has no	31.	Open Due 4/15/11	Open-NRC Review			

[1] AP-1000 is a registered trademark of the Westinghouse Electric Company LLC

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				Instrumentation System Failure Modes and Effects Analyses," and demonstrate how these potential failures do not adversely affect reactor safety.	impact on any Safety Analysis documented in Chapter 15 of the Watts Bar Unit 2 FSAR. *(d)* The IIS includes the 1E qualified CET and CET analog signal cables required to allow the CETs to be directly connected to the Common Q Post Accident Monitoring System (PAMS). There is no other interface to safety systems. The CET signals are electrically isolated from signals output from the non-1E FID signals and signal processing electronics. *(e)* The qualification for the BEACON System to perform the core power distribution measurement function using the Watts Bar Unit 2 WINCISE style IIS instrumentation is documented in the generic NRC Safety Evaluation Reports (SER) provided with WCAP-12472-P-A. This WCAP generically approves the BEACON System for use at PWR reactors including those using Movable In-core Detector Systems (MIDS) like Watts Bar Unit 1 and, through Addendum I-A and 2-A, those like Watts Bar Unit 2 using a WINCISE type fixed in-core instrumentation system. The specific differences between the Unit 1 and Unit 2 core power distribution measurement systems are too numerous to simply list. A detailed description of the Watts Bar Unit 2 IIS hardware is provided in section 2 of the WINCISE System Technical Manual NO-WBT-002 (Attachment 5). *(f)* NUREG-800 section 7.0-A, Table 7.0-A-1. Review Topics for Various Systems, requires only a limited review for non-safety related system discussed in NUREG-800 section 7.7 Control. WINCISE is a non-safety-related, indication only system within the scope of NUREG-800 section 7.7. The limited review required is: "Control systems receive a limited review as necessary to confirm that control system failures cannot have an adverse effect on safety system functions and will not pose frequent challenges to the safety systems." The only WINCISE interface with a safety-related system is the CET in the IITA which is hardwired to the Common Q PAMS system. See item (g) below for a description of the qualification process that demonstrates that failures in the balance of the WINCISE system do not impact the performance of the safety-related CET function. *(g)* With the exception of the IITA hardware, WINCISE is a non-safety-related indication system. The IITA assemblies meet the following criteria: i. R.G. 1.26 Rev. 3 Quality Group Classification and Standards for Water, Steam and Radioactive Waste Components of Nuclear Power Plants ii. R.G. 1.38 Rev. 2 Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage and Handling of Items for Water-Cooled Nuclear Power						

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
					Plants iii. R.G. 1.71 Rev. 0 Welder Qualification for Areas of Limited Accessibility iv. R.G. 8.8 Rev. 3 Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be As Low As Reasonably Achievable v. R.G. 8.19 Rev. 1 Occupational Radiation Dose Assessment in Light-Water Reactor Plants Design State Man-Rem Estimates vi. R.G. 1.84 Rev. 27 Design and Fabrication Code Case Acceptability – ASME Section III, Division 1R.G. 1.85 Rev. 27 Material Code Case Acceptability – ASME Section III, Division 1 1.1.4 The design, materials, fabrication, inspection, and testing of the IITA shall be in accordance with the ASME Boiler and Pressure Vessel Code, Section III Class 3, and all applicable Code Cases as proposed by the supplier and approved by Westinghouse. Materials shall be in accordance with this specification. 1.1.5 Component Classification – The IITA is classified as an instrument tube, so it is not under the jurisdiction of the ASME per NCA-1130(c). However, the design, primary pressure boundary materials, and NDE Requirements are per ASME Section III, Class 3 and the IITA is classified as Safety Class 2. The non-safety-related WINCISE Signal Processing System Cabinets are located inside containment and are therefore required to not impact the function of any safety-related equipment. To meet this requirement the cabinets were tested and passed based on the following criteria: i. In accordance with WB-DC-40-31.2, “Watts Bar Nuclear Plant Seismic Qualification of Category 1 Fluid System Components and Electrical or Mechanical Equipment,” Revision 8, November 2000 and U.S. N.R.C. Regulatory Guide 1.100, “Seismic Qualification of Electrical and Mechanical Equipment for Nuclear Power Plants,” Revision 2, June 1988, the equipment must withstand five OBEs and one SSE without creating missiles. Testing was done in accordance with: (1) IEEE Std 344-1975, “IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations,” Institute of Electrical and Electronics						

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
					Engineers, Inc., 1975 (2) IEEE Std 344-1987, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, Inc., 1987 ii. In accordance with U.S NRC Regulatory Guide 1.180 "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems," Revision 1, October 2003 and IEEE 323-1983 "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generator Stations," Institute of Electrical and Electronics Engineers, Inc., 1983, the equipment must not generate spurious electromagnetic emissions or suffer some common mode failure due to its operating environment that could directly or indirectly impact the operation of safety-related equipment (1) IEC 61000-6-2, "Electromagnetic compatibility (EMC). Generic Standards. Immunity for Industrial Environments," 2005 (2) MIL-STD-461E, "Requirements for the control of Electromagnetic interference Characteristics of Subsystems and Equipment," August 1999 (3) IEC 61000-4-4, "Electromagnetic compatibility (EMC) – Part 4-4: Testing and Measurement Techniques - Electrical Fast Transient/Burst Immunity Test," 1995 (4) IEC 61000-4-12, "Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurement Techniques, Section 12: Oscillatory Waves Immunity Tests," 1996 iii. In order to demonstrate that a maximum expected surge of 600 volts on the power input to the cabinets would not propagate and damage the CET cables in the IITA, the cabinets were surge tested in accordance with IEC 61000-4-5, "Electromagnetic compatibility (EMC) – Part 4-5: Testing and Measurement Techniques - Surge Immunity Test," 1995. *(h)* The cables for the CETs separate from the FID cables at the seal table. The CETs are connected directly to the Common Q PAMS cabinet. The FIDs are connected directly to the in-containment signal processing system cabinets. *(i)* Attachment 5 is the proprietary section 2 "Equipment Description" of NO-WBT-002, "Westinghouse Incore Information Surveillance & Engineering (WINCISE™) System Technical Manual." This is strictly a proprietary						

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					document and a non-proprietary version will not be submitted. An affidavit for withholding will be submitted within two weeks of receipt from Westinghouse. *(j)* Attachment 6 is the proprietary WINCISE FMEA. A non-proprietary version and affidavit for withholding will be provided within two weeks of receipt from Westinghouse. Westinghouse is available to discuss any specific questions on the methodology and hardware used in the Watts Bar Unit 2 IIS that the NRC believes are not well defined in the documents listed above.						
361	7.7.1.1		EICB (Carte)	Was the Foxboro IA system developed under a 10 CFR 50 Appendix B compliant program?	Foxboro I/A is a non-safety related system. Therefore, 10 CFR 50 Appendix B is not applicable.	32.	Open Due 4/15/11	Open-NRC Review			
362	7.6.1	7.6.7	EICB (Kemper & Singh)	OI #331 requested TVA to provide information regarding how the Loose Parts Monitoring System (LPMS) in-containment components (e.g., Accelerometer (including the integral insulated hardline cable), Softline cable, and Remote Charge Preamplifiers) were qualified for vibration as addressed in regulatory position C.1.g of RG 1.133, Rev. 1. TVA responded by stating that "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." However, the staff still desires further clarification on this response. Specifically, please provide a documented basis that demonstrates the LPMS in-containment equipment is qualified for normal operating conditions (e.g., test results compared to the equipment qualification specification), including vibration qualification. Also, provide justification for why vibration qualification if the Remote Charge Preamplifier is not required.	TVA committed to provide a letter on the docket (targeted is for 4/30/2011) stating why the the in-containment equipment has been qualified for vibration per RG 1.133, Rev. 1. (1) Attachment 4 contains Westinghouse document "WBT DMIMS-DX™ Seismic Evaluation of the Digital Metal Impact Monitoring System (DMIMS-DX™) for Watts Bar Unit 2," EQ-QR-33-WBT, Revision 0 (proprietary). The non-proprietary version and affidavit for withholding will be submitted within two weeks of receipt from Westinghouse. Attachment 5 contains Westinghouse non-proprietary white paper WBT-D-2782, "Westinghouse DMIMS-DX In-Containment equipment environmental specifications" EQ-EV-71-WBT-P, Revision 1, "Environmental Evaluation and Operating History of the Westinghouse DMIMS-DX Preamplifier and Softline Cable Used at Watts Bar 2" dated February 2011 was submitted on TVA to NRC letter dated Februay 25, 2011 (Reference 4). While no specific vibration testing of the accelerometers was performed, Westinghouse has over 40 years experience in loose parts monitoring technologies. Since 1970, Westinghouse has installed over 40 metal impact monitoring systems, many of which use the same in-containment equipment that has been supplied to Watts Bar Unit 2. Table 1 lists a selection of plants in which a Loose Parts Monitoring System is installed using the same accelerometers as those for Watts Bar Unit 2 demonstrating the long term operability of the accelerometers in environments similar to Watts Bar Unit 2. (2) The Remote Charge Preamplifiers are mounted in junction boxes inside containment. The junction boxes are hard mounted either to the crane wall or to a fan room wall. The crane wall and fan room walls are	5.	Open-TVA NRC Update (WEK)--On March 27, 2011 TVA provided a document WBT-D-2782 in response to this OI. This document provides the in-containment LPMS equipment qualification specification(s) and indicates that "…the normal environmental conditions for a Westinghouse containment are reported in Tables 6-1 and 6-2 from WCAP 8587 Rev. 6, "Methodology for Qualifying Westinghouse WRD Supplied NSSS Safety Related Electrical Equipment". These tables are attached." The EQ specifications are included in the document, however, the documented basis that demonstrates the in-containment equipment has been successfully tested to meet or exceed its EQ specification is not included. **Please include the in-containment EQ test results.** **5/5/2011 Update (WEK): TVA committed to provide an analysis, tests, of combined analysis and tests for the LPMS in-containment equipment subject to vibration.**	Open-TVA/Bechtel/NRC Review of Partial 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
					subject to any significant vibration during normal operation.						
363	7.5.1.1.3 and 7.9.1	7.5.2	EICB (Rahn and Mossman)	OI#199 requested TVA to provide information concerning how TVA plans to meet regulatory criteria for Quality (10 CFR 50.55a(a)(1)) associated with the Technical Support Center and Nuclear Data Link. TVA responded in Letter Dated October 5, 2010, Item 63; however, TVA's response does not address the quality aspects of these system features. A similar question had been asked for Quality Criteria adherence for the SPDS and the BISI functions of the Integrated Computer System. In response to that request (same letter) TVA provided a description of TVA procedures, BISI software development procedures, and various management measures that will be taken to assure high quality in the design, operation, and maintenance of the SPDS and BISI functions of the ICS. Since the TSC and Nuclear Data Link information originates in the SPDS function of the ICS, are there any aspects of the quality measures that apply to the TSC and NDL features developed as part of quality processes for the ICS that are applicable to the data communications features? Specifically, what is the scope of TVA Procedure SPP-2.6 "Computer Software Control"? How does it apply to the ICS functions of a) SPDS, b) BISI, and c) TSC and NDL functions? Wouldn't there be aspects of the quality procedures that apply to the development, maintenance, and operations of the software needed to support the data communications features. Also, what quality measures will be applied to develop, maintain, and operate the hardware that accomplishes the TSC and NDL functions to ensure that these features will be reliable and available when needed?	TVA Procedure SPP-2.6 "Computer Software Control" has been superseded by TVA Procedure NPG-SPP-12.7, "Computer Software Control," Revision 0, dated December 17, 2010 (Attachment 3). To ensure quality, the design, testing, and inspection of all Integrated Computer System (ICS) software including a) SPDS, b) BISI and c) Technical Support Center (TSC) and Nuclear Data Link (NDL) functionality is controlled by qualified personnel in accordance with TVA procedure NPG-SPP-12.7. The TSC and NDL functions are provided and performed by the ICS and, in the case of NDL, the Central Emergency Control Center (CECC) computers in Chattanooga. Any changes to ICS software must be documented and controlled using TVA procedure NPG-SPP-12.7. This includes the a) SPDS, b) BISI and c) TSC and NDL functions. 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. Controls in NPG-SPP-12.7 guide the development and testing of the software changes. Other controls established by this procedure to further maintain quality standards are: • The application custodian implements controls to prevent unauthorized changes to the software. • Changes are made in a non-production environment, and validation testing takes place before the change is installed on the ICS when possible. • Once validation testing begins, the source code is placed under configuration control. • 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. • Documentation related to ICS software changes are QA records. • The software source code is kept in a physically secure, environmentally controlled space to prevent inadvertent changes. • Cyber security considerations are also considered in the storage environment. • 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	6.	Due 4/30/11	Open-NRC Review			

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
					determine if the quality of one or more points is questionable. The hardware involved in the TSC and NDL functionality is verified to be operable on a periodic basis. In the case of the NDL functionality, the ICS transmits the required data to the CECC on a continuous basis. The CECC monitors the status of the ICS data communications and alarms are generated when the link is not active. The Emergency Plan (EP) staff conducts a quarterly test that verifies that NDL data is successfully transmitted from each unit to the NRC.						
364	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response: TVA performed an analysis and concluded that the Common Q PAMS equipment does not need to meet either IEEE 279-1971 or IEEE 603-1991 and so no analysis was performed or provided. However, SRP (NUREG-0800 Rev. 2 dated March 2007) Section 7.7, "Information System Important to Safety," specifically identifies IEEE Std 603-1991 as being applicable to accident monitoring instrumentation. Based upon the review of this item, the staff finds the following open items: 1 TVA to demonstrate that the Common Q PAMS meets the applicable regulatory requirements in IEEE Std 603-1991. 2 TVA to updated FSAR (Amendment 103) Table 7.1-1 to reference IEEE Std 603-1991 for WBN2 Common Q PAMS ~~and Sorento Containment High Radiation Monitors~~.	**TVA Partial Response to NRC Request** 2. Table 7.1-1 will be updated to reference IEEE Std 603-1991 for the Common Q PAMS. TVA has reviewed the requirements of IEEE Std 603-1991 for the Sorrento Containment High Range Radiation Monitors and determined that IEEE Std 603-1991 is not applicable. IEEE 603-1991 is applicable to actuation systems. While TVA lists the containment high range radiation monitors as RG 1.97 Revision 2 Typa A variables, the classification is not based on the RG 1.97 requirements which states: "Type A, those variables that provide primary information needed to permit the control room operating personnel to take the specified manually controlled actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for design basis accident event." TVA calculation WBN0SG4047, "PAM Type "A" Variables Determination" uses a broader definition. The calculation definition is: "The type "A" variables will be divided into three groups based on the parameter's purpose. The groups are: (1) event identification, (2) event recovery to plant stabilization, and (3) maintaining the stabilized conditions from event recovery to hot standby. Following a reactor trip, the termination point for transients at WBNP is considered a stabilized condition at hot standby per chapter 15 of the WBN FSAR. Event recovery actions are those manual actions taken to mitigate a design basis accident to a stabilized condition. The plant can be considered stabilized when the plant parameters vary slowly and automatic systems are not being initiated. The diagnostic process consciously performed by the operator via the plant variables to interpret an event indication will be considered as a safety-related operator action regardless of the lack of manual manipulation of equipment. This diagnostic process is necessary to enable the operator to distinguish the "type" of transient and take the correct mitigating actions."	4. N	Open Due 5/15/11	Open-TVA/WEC/NRC Review of Partial Response			**NNC 4/125/2011:** See Open Item No. 81. **NNC 5/4/2011:** Please explain why the TVA calculation WBN0SG4047, "PAM Type "A" Variables Determination" uses a broader definition for Type A variables than is in the FSAR (Amendment 103). Why is this definition not 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
					A review of TVA calculation WBN0SG4047 and the associated Emergency Instructions found that there are no operator actions that are meet the RG 1.97 Revision 2 definition for a Type A variable which are based on the containment high range radiation monitors. Based on this review, IEEE 603 is not applicable to the containment high range radiation monitors.						**NNC 5/4/2011:** Will the FSAR (Amaendment 103) Table 7.5-2 Var No. 4, "Contaimnment Radiation" be updated to change the variable type designation? Will this variable still be Qualification Category No. 1?
365	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response: "that WBN2 is not committed in complying with Reg. Guide 1.75…Since WBN2 is not committed to RG 1.75 or IEEE-384, no comparison is required…" However, WBN2 is committed to RG 1.75 Rev. 2, "Physical Independence of Electric Systems." RG 1.75 Rev. 3 and IEEE Std. 384-1992 are used, in part, to address IEEE Std 603-1991 Clause 5.6.1. The current NRC staff position for RG 1.75 is documented in Rev. 3. Based upon the review of this item, the staff finds the following open item: 1 TVA to updated FSAR (Amendment 103) Table 7.1-1 to include RG 1.75 Rev. 3 for WBN2 Common Q PAMS and the Sorento Containment High Radiation monitor. The Common Q PAMS was designed to meet the requirements of RG 1.75 Rev. 2. WBN2 did not perform an analysis to RG 1.75 Rev. 3. Based upon the review of this item, the staff finds the following open item: 2 TVA to evaluate Common Q PAMS and the Sorento Containment High Radiation monitor for conformance with RG 1.75 Rev. 3.	The Common Q PAMS panel internals meets the requirements of Regulatory Guide of 1.75 and IEEE Std 384 1992. The external Common Q PAMs cables are routed as 1E, 10 CFR 50.49, trained cables in accordance with Watts Bar Design Criteria WB-DC-30-4, which is not in conformance with Regulatory Guide 1.75 Revision 3 or IEEE Std 384-1992. As noted in WBN Unit 2 FSAR section 8.1.5.3 "Compliance to Regulatory Guides and IEEE Standards" note 2 "Regulatory Guide 1.75 was issued after the Watts Bar design was complete. Separations criteria for WBNP are given in Section 8.3.1.4.2." FSAR section 8.3.1.4.2 provides a detailed discussion of the WBN Unit 2 separation requirements and compensatory actions. To ensure that non-1E cables do not degrade 1E cables, non-1E routed in a Class 1 structures are evaluated to ensure that they are adequately protected to prevent propagation of damage from the non 1E cables to 1E cables. The NRC reviewed TVA's separation criteria as supplemented by a breaker testing program in SSER 16 and found it to be acceptable. The same criteria and breaker testing program are applicable to WBN Unit 2.	5. Y	Open Due 5/15/11	Open-NRC Review			**NNC 4/125/2011:** See Open Item No. 81.
366	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response: TVA stated that the Common Q PAMS equipment fully meets the RG 1.100 **Rev. 0** and is compliant with Rev. 3, with exception of testing above 33 Hz, which is not applicable to Watts Bar. The WBN2 FSAR (Amendment 103) references Regulatory Guide 1.100 **Rev. 1** "Seismic Qualification of Electrical Equipment for Nuclear Power Plants." The Common Q PAMS was designed to meet the requirements of RG 1.100 Rev. 2. RG 1.100 Rev. 3 is the current revision of this guide and is endorsed by the NRC. RG 1.100 Rev. 3 endorses IEEE 344-2004. Based upon the review of this item, the staff finds the following open item: 1 TVA to updated FSAR (Amendment 103) Table 7.1-1 to include RG 1.100 Rev. 3 for WBN2 Common Q PAMS and the Sorento Containment High Radiation monitor. or	The Common Q PAMS and RM-1000 radiation monitors comply with IEEE 344-2004 and with Reg. Guide 1.100 Revision 3 with the exception of testing above 30Hz. Table 7.1-1 will be updated to reflect conformance.	6. Y	Open Due 5/15/11	Open-NRC Review			**NNC 4/125/2011:** See Open Item No. 81.

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 TVA to evaluate Common Q PAMS for conformance with RG 1.100 Rev. 1.							
367	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response. The WBN2 FSAR (Amendment 103) references RG 1.153 Rev. 0, "Criteria for Safety Systems." The Common Q PAMS is designed to meet the requirements of RG 1.153 Rev. 1. By letter dated February 25, 2010 (ML110620219), TVA stated: "The subject Regulatory Guides [RG 1.153 Rev. 0 & 1] endorse and reference other standards. Common Q PAMS has been evaluated to comply with the requirements of these other endorsed standards ([Comparison report in this letter titled IEEE-279-1971 to IEEE-603-1991 Comparison]). Therefore no additional analysis needs to be performed and no further action is necessary." However, the "Comparison report in this letter titled IEEE-279-1971 to IEEE-603-1991 Comparison," stated: "The first of the two standards, IEEE-279, is part of the design basis of WBN2 but is not relevant to Common Q PAMS. The second standard, IEEE-603-1991 is not part of the design basis for the Common Q PAMS forWBN2." Based on the reasoning quoted above, WBN2 did not evaluate the Common Q PAMS against the criteria of RG 1.153 Rev. 1; therefore, the staff finds the following open item (see also Open Items No. 1 & 2 above.): 1 TVA to evaluate Common Q PAMS for conformance with RG 1.153 Rev. 1.	Common Q PAMS complies with Regulatory Guide 1.153 Revision 1. The response in Attachment 4 to TVA to NRC letter dated February 25, 2011 (Reference 3) was in error.	7. Y	Open Due 5/15/11	Open-NRC Review			**NNC 4/125/2011:** See Open Item No. 81.
368	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response. The WBN2 FSAR (Amendment 103) references RG 1.152 Rev. 0, "Criteria for Digital Computers in Safety Systems of Nuclear Power Plants." The Common Q PAMS was designed to meet the requirements of RG 1.152 Rev. 1. RG 1.152 Rev. 2 is the current revision of this guide and is endorsed by the NRC. By letter dated February 25, 2010 (ML110620219), TVA stated: "RG 1.152 rev 2 endorses ANSI/IEEE-ANS-7-4.3.2-2003, but also provides extra regulatory guidance concerning computer based cyber security. Since this revision was not part of the design basis of WBN2 or Common Q PAMS, the project makes no commitment to the compliance of RG 1.152 rev 2." Based upon the review of this item, the staff finds the following open item: 1 TVA to evaluate Common Q PAMS for conformance with RG 1.152 Rev. 2.	Attachment 6 contains the evaluation for Common Q PAMS for conformance with RG 1.152 Revision 2	8. Y	Open Due 5/15/11	Open-NRC Review			**NNC 4/125/2011:** See Open Item No. 81.

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
369	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response. The WBN2 FSAR (Amendment 103) references IEEE 7-4.3.2-1982, "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations" as endorsed by Regulatory Guide (RG) 1.152, "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants," Revision 0 for the Eagle 21 system. The current regulatory position is documented in RG 1.152 Rev. 2 which endorses IEEE Std 7-4.3.2-2003 as an acceptable method for using digital computers to meet IEEE Std 603-1991. Based upon the review of this item, the staff finds the following open item: 1 WBN2 to updated FSAR Table 7.1-1 to reference IEEE 7-4.3.2-2003 as being applicable to WBN2 Common Q PAMS and the Sorento Containment High Radiation monitor.		9. N	Open Due 5/15/11	Open-TVA/WEC			**NNC 4/125/2011:** See Open Item No. 81.
370	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response. The WBN2 FSAR (Amendment 103) does not reference RG 1.168, IEEE 1012, or IEEE 1028. IEEE Std 7-4.3.2-2003 indentifies IEEE Std 1012-1998 as normative. RG 1.168 Rev. 1 endorses, with clarifications, IEEE 1012-1998. The current staff positions are documented in RG 1.168 Rev. 1, IEEE 1012-1998, and IEEE 1020-1997. Based upon the review of this item, the staff finds the following open item: 1 WBN2 to updated FSAR Table 7.1-1 to reference RG 1.168 Rev. 1, IEEE 1012-1998, and IEEE 1020-1997 as being applicable to WBN2 Common Q PAMS and the Sorento Containment High Radiation monitor.	**TVA Partial Response to NRC Request:** Common Q PAMS is designed in accordance with Regulatory Guide 1.168, Revision 1, IEEE 1012-1998 and IEEE 1028-1997. These references will be added to FSAR Table 7.1-1.	10. Y	Open Due 5/15/11	Open-TVA/WEC/NRC Review of Partial Response			**NNC 4/125/2011:** See Open Item No. 81.
371	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response. The WBN2 FSAR (Amendment 103) does not reference Regulatory Guide 1.209, "Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants." Based upon the review of this item, the staff finds the following open item: 1 WBN2 to updated FSAR Table 7.1-1 to reference RG 1.209 and IEEE Std. 323-2003 as being applicable to WBN2 Common Q PAMS and the Sorento Containment High Radiation monitor. TVA did not docket an evaluation against the criteria in RG 1.209. Based upon the review of this item, the staff finds the following open item: 2 WBN2 to evaluate Common Q PAMS for conformance with RG 1.209 and IEEE Std. 323-2003.		11. N	Open Due 5/15/11	Open-TVA/WEC			**NNC 4/125/2011:** See Open Item No. 81.

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
372	7.5.2.2	7.5	EICB (Carte)	On **5/6/2010** (See Open Item No. 81) the NRC Staff requested an evaluation of the Common Q PAMS against the current staff position. By letter dated **2/25/11** (ML110620219), TVA docketed a response. The requirements in the SysRS and SRS are not traceable back to the design basis (e.g., IEEE Std 603-1991 Section 4) for the system. The SRS does not include any documented evidence that it was ever independently reviewed in accordance with the 10CFR50 Appendix B Criterion III, "Design Control." (Note: It appears that the only Common Q or WBN2 PAMS document that was independently reviewed in accordance with 10 CFR 50 Appendix B requirements is the SysRS.) Based upon the review of the SysRS and SRS, the staff finds that there is reasonable assurance that the systems fully conform to the applicable guidelines, except for the following open items: 1 TVA to produce an acceptable description of how the SysRS and SRS implement the design basis requirements of IEEE 603-1991 Clause 4. 2 TVA to produce a final SRS that is independently reviewed in accordance with 10CFR50Appendix B, "Criterion III Design Control," requirements.	**TVA Partial Response to NRC Request:** 1. Attachment 7 contains the evaluation for how the Common Q PAMS SysRS and SRS implement the design basis requirements of IEEE 603-1991 Clause 4.	12. Y	Open Due 5/15/11	Open-TVA/WEC/NRC Review of Partial Response			**NNC 4/125/2011:** See Open Item No. 81.
373	7.5.2.2	7.5	EICB (Carte)	The SDDs do not include any documented evidence that they were independently reviewed in accordance with the 10CFR50 Appendix B Criterion III, "Design Control." Based upon the review of the SDDs, the staff the following open item: 1 TVA to produce final SDDs that are independently reviewed in accordance with 10 CFR50 Appendix B Criterion III, "Design Control," requirements.		13. N	Open Due 5/15/11	Open-TVA/WEC			
374	7.5.2.2	7.5	EICB (Carte)	By letter dated October 29, 2010 (ML103120711), TVA docketed a draft technical evaluation associated with an engineering design change (ML103120712) that states the Common Q PAMS will require changes in the technical specifications. The technical specifications (TS) have not be received yet for review. The TS will be reviewed once they are received. 1 Confirm/Verify Technical Specification changes associated with Common Q PAMS are acceptable.	1. The Technical Specification Changes required by implementation of the Common Q PAMS were made in Revision B of the Technical Specifications which were submitted on TVA to NRC letter dated February 2, 2010, "Watts Bar Nuclear Plant (WBN) - Unit 2 - Developmental Revision B of the Technical Specifications (TS), TS Bases, Technical Requirements Manual (TRM), TRM Bases; and Pressure and Temperature Limits Report (PTLR)" ADAMS ascension number ML100550326 (Reference 2).	14. N	Open Due 5/15/11	Open-NRC Review			
375	7.7.9		EICB (Alvarado)	1. During the conference call held on 4/12, the staff requested TVA to provide a description of the differences in hardware and/or software design and implementation of the Incore Instrumentation System instrumentation between WBN2 and WBN1. This information was not included in the 4/15 letter. When will this be provided? 2. The response for item g provided by TVA does not describe how the regulatory requirements were met. It only listed the criteria and stated that it passed the test. Also, the criteria for IITA does not list criteria for environmental qualifications of safety-related equipment (e.g., RG 1.29, Environmental Equipment Qualifications). Please provide summary test reports. 3. Attachment 4 of the TVA letter 4/15 states that the CET and	**TVA Partial Response to NRC Request:** 1. System differences are described in EDCR 52321-1 Excerpts (Attachment 4 to TVA to NRC letter dated April 15, 2011 (Reference 1) pages 2 and 3, 7 through 9, and 60 through 113. 2. Please see response to the following question for EQ reports. Only the safety related portion of IITA (namely the CETs and CET cable assemblies) are safety significant and fall under the cited regulatory guide. 3. Please refer to Westinghouse report DAR-ME-09-10, Revision 0, Qualification Summary Report for the WINCISE Cable and Connector Upgrade at Watts Bar	15. N	Response on Hold based on May 12 Rockville Public Meeting	Open-TVA/WEC/NRC Review of Partial 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
				CET cable assembly, as well as mineral insulated cables and IITA connectors, are EQ and class 1E qualified. Please provide the qualification summary test report for these components. 4. Attachment 5 of the TVA letter 4/15 provides the hardware description for the WINCISE (WEC document NO-WBT-002). Does this document include a section for Software Description? If so, please provide a copy. 5. Attachment 7 of the TVA letter 4/15 describes the functionality of the IIS for Watts Bar unit 2 and the IIS used in AP-1000. The description provided only describes the similarity for the core exit thermocouple (CET) and the PAMS system. However, this document does not describe the other components of the IIS (e.g. IITAs). Please clarify if the only similarity between Watts Bar unit 2 and AP-1000 is for the CETs and PAMS, and that there is not similar for the IITAs. 6. The WCAP-12472-P-A for the BEACON system describes that the system has three operational levels: on line monitoring, tech spec monitor (TSM), and direct margin monitor. For Unit 1, TVA requested approval of the Beacon TSM to be only used as a tech spec monitor for present peaking factor limits. Please confirm that the functionality to be implemented in Unit 2 is the same than the one requested and approved for unit 1. Note Attachment 5 states that the Beacon servers run the Beacon TSM, but it is not clear that this is the only level operating for the IIS. 7. The SE for use of the Beacon System in Unit 1 states that the BEACON system will be used when thermal power is greater than 25% RTP. Page 129 of Attachment 4 states that "the WINCISE system will be capable of performing its required core monitoring functions at or above 20%RTP." Please clarify what the intent is for the Beacon system in Unit 2. 8. The technical evaluation provided for the Beacon System for unit 1 states that "the movable incore detectors (MIDs) are used for periodic calibration of the PDMS when thermal power is greater than 25% RTP. Additionally, the MIDs are used whenever the PDMS is inoperable or whenever power distribution is below 25%." Please explain how this function will be performed with the fix incore detectors and the Beacon system for unit 2. 9. In the NRC SE for WCAP-12472-P-A for the BEACON system, the staff accepted this system but subject to three conditions. In the TVA submittal for use of the Beacon system in unit 1, TVA described how they met these conditions for Unit 1. Please describe how TVA will meet these conditions for Unit 2. 10. Please clarify the following statement provided in Attachment 4, Page 25: "During certain accident scenarios, it is possible for the CETs to see temperatures up to 20 deg F different from Unit 1." 11. Attachment 4 and 5 explained that the Mineral Insulation cable	Unit 2 (proprietary) (TVA Document Number: 25402-011-V1A-MG00-01949-001-WBT-D-1464) (Attachment 8) for qualification of the associated cable assemblies. The non-proprietary version of DAR-ME-09-10, Revision 0, Qualification Summary Report for the WINCISE Cable and Connector Upgrade at Watts Bar Unit 2 and the affidavit for withholding will be submitted within two weeks of receipt from Westinghouse. The qualification report for the IITAs has not been completed. The proprietary, non-proprietary versions and the affidavit for withholding will be submitted within two weeks of receipt from Westinghouse. 4. There is no software description in the reference (NO-WBT-002). The functionality of the software for the IIS is described in the reference. Note that the BEACON System software is not part of safety related portion of IITA. The non-safety IIS provides input to the BEACON System. 5. The IITA are composed of the CET and the self-powered neutron detectors (SPDs). The Watts Bar Unit 2 and AP1000 IITAs have the same function, but are a slightly different design. These differences are necessary because the Watts Bar IITAs are bottom mounted and the AP1000 IITAs are top mounted. Additionally, the IITA are sized appropriately for Watts Bar and AP1000 because the fuel assemblies are different sizes. The Watts Bar IITA design includes 5 self powered neutron detectors (SPDs) of sequentially increasing length, up to a maximum length of 12 feet. The AP1000 IITA design includes 7 SPDs of sequentially increasing length, up to a maximum of 14 feet. 6. Unit 2 has only been provided with the BEACON TSM function. 7. The BEACON topical report states that BEACON PDMS will be inoperable below 25% RTP. The electrical equipment operability requirements are set below the core power distribution monitoring requirements to ensure that the electronics are operable when needed to support core monitoring. 8. Periodic flux maps using the MIDs (Unit 1) have been replaced by continuous analysis of the permanently installed fixed incore detectors (Unit 2). Data from these fixed incore detectors will periodically be used to generate a set of calibration factors for the BEACON PDMS. The following description was provided in response to a RAI for addendum 1 of the BEACON topical report: "The basic concepts and methodologies used for determining the detector uncertainties and limitations are the same between a BEACON system for a typical						

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
				allows the isolation of the core exit thermocouples (1E) and self-powered neutron detector (non-1E) signals. Please provide the analysis that evaluated this separation, as well as the evaluation that show that failure of the non-1E signal won't affect the 1E signal. 12. Page 129 of Attachment 4 states that a minimum of three thermocouples are operable in each quadrant. Table 7.5-2 of the SSER (R.G. 1.97) states that 4 thermocouples should be operable in each quadrant. Please explain if TVA is deviating from the requirements in R.G 1.97, and how this is justified. 13. Please provide information regarding the effects of a software common cause failure (SWCCF) on the IIS. 14. The FMEA provided by TVA on 4/15 has not been updated (see email from Steve Clark on 4/11). Also, the FMEA provided focus on failures during installation and commissioning and it does not identify measures for failures during operation. Last, this FMEA does not address software failures, only component failures and installation failures. Please provide an updated and complete version of the FMEA 15. Attachment 4, TVA document "Incore Instrumentation System" describes the system requirements. Therefore, provide a complete system description of the IIS for the staff to evaluate the IIS to be installed in Watts Bar Unit 2. Also, the description for the incore thermocouple system in this TVA document is inconsistent with the description provided in Westinghouse WINCISE Hardware Description (Attachment 5). For example, Section 1.2 of the TVA document states that there are 65 incore thermocouples and Section 2.2.9 describes that the incore thermocouples provide an input signal to the Inadequate Core Cooling Monitor. 16. TVA attachment 4 of the 4/15 letter show modifications to the DBE design criteria. Please provide detailed explanation about these modifications. 17. Please explain if new penetration and routing were required for IIS' signals. If new penetrations are required, explain how these were qualified. Also, explain the criteria used to route the power/control cables. 18. Questions on Technical Specification: (1) The TVA package states that TS 3.1 and TS Bases 3.1 were modified due to WINCISE. Please provide detailed information to evaluate the modifications to the TS. (2) The TVA mark up does not define the operating limits in the TS for the reactor power distribution. Please provide detailed information on how the IIS may impact the Technical Specification. 19. Redundancies are designed and built into the signal processing system to avoid impacting operation in the event of the loss of some SPD signals. The master signal processing rack data interface card provides the output data stream to the Application server. Each cabinet master signal processor rack contains redundant data interface cards. Loss of one data	Westinghouse plant and a plant that is using SPDs. However, since the basic hardware is different, the actual uncertainties, limitations and restrictions associated with fixed incore detectors are different from the corresponding values associated with the use of incore movable detectors. The prime purpose of the BEACON system is to continuously measure the core peaking factors with high accuracy. In the standard Westinghouse BEACON plant, the incore movable detectors provide periodic (180 EFPD) calibration input to the BEACON System with thermocouple and excore detector readings providing data for continuous power distribution monitoring. The plant specific analysis used to determine the uncertainties in this measurement are described in Section 5 of WCAP-12742-P-A. The fixed incore detector functionality replaces the functionality of the core exit thermocouples, excore detector axial power shape information, and periodic incore movable detector inputs used by the BEACON System continuous monitoring process in Westinghouse design plants. The fixed incore detector uncertainties are analyzed for a specific plant detector configuration using the methodology described in Section 5.0 of Addendum 1 to WCAP-12472-P-A. Generally speaking, the more fixed incore detectors are installed, and the higher each detector's measurement accuracy is (smaller measurement variability), the smaller the measured core power peaking factor uncertainty becomes. As described in response to Question 8, the SPD detector design and layout are different for the different NSSS vendors. Furthermore, there are some basic differences in the application of the SPD and moveable detector systems. These include: • As plant operation continues, neutron irradiation depletes the detector sensor material and increases the measurement variability. The measurement variability of the incore movable detectors effectively does not change during operation because the movable detector measurements are not present in the core for sufficiently long times to undergo any appreciable depletion of the detector material. • Some of the fixed incore detectors may fail during operation, which requires that the power distribution measurement uncertainty be adjusted during plant operation. If an individual incore movable detector fails, the core locations measured by the failed detector can be accessed using one of the other movable detectors, so no uncertainty adjustment is required. • If an incore movable detector location access thimble becomes blocked, then the power						

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				interface card will not result in a loss of data output from the cabinet. Provide detailed description on how this works (e.g., is the switchover software based?) 20. The Application Servers receive information from Signal Processing System (SPS Cabinets), Integrated Computer System (ICS), and BEACON. The WINCISE IP Switches provide the main hub for traffic flow from the SPS cabinets, BEACON servers, Application Servers, and ICS. Provide detailed description of the communication among the Integrated Computer System (ICS) and the Beacon System and the Wincise's Application servers. 21. Attachment 4, TVA document "Incore Instrumentation System" describes that the WINCISE system includes a Domain server, which provides a supportive function and is not required for the PDMS to receive needed information from the Application Server. However, the domain server provides an environment for the development and maintenance of application and system software. Please explain how this domain server will be configured and used for WINCISE in WBN2. Note that the domain server is not part of the Westinghouse WINCISE Hardware Description (Attachment 5) 22. Page 52 of Attachment 4, question 1.5 was answered yes, but the I&C calculation to be provided in Sections 4 and 5 is not included. Please explain if this calculation was performed, and if so provide a description. 23. Page 52 of Attachment 4, Section 6 does not include the block diagram of the proposed modification to WBN2. Please provide a block diagram if the system, including power sources.	distribution measurement uncertainty associated with the BEACON calibration data generated from the incore movable detector input is automatically adjusted by the BEACON System. Should the thimble become usable at a later time, BEACON automatically adjusts to this situation. If a FID string cannot be inserted into the thimble during the refueling, the entire string is left out of the core and the uncertainty is adjusted accordingly for the entire cycle. The BEACON power distribution uncertainty methodology is designed to determining the power peaking factor measurement uncertainty for a wide range of the SPD detector operating conditions. The measure peaking factor uncertainty is defined as a function of the fraction of inoperable detectors and the detector measurement variability as given by Equation 3 and Equation 4 of Addendum 1 to WCAP-12472-P-A. The methodology of the power peaking factor uncertainty determination is described in Section 5 of Addendum 1 to WCAP-12472-P-A. The constants, variabilities, and coefficients used in the equations described in Section 5 of Addendum 1 to WCAP-12472-P-A are specific for a given reactor core geometry, detector configuration, and installation layout, and can be obtained as described in Section 5. The equations are applicable for a wide range of detector conditions anticipated during the reactor operation. The behavior of the measured peaking factor uncertainties as a function of the incore detector variability and composite random detector loss levels are shown in Figure 4 and Figure 5 of Addendum 1 to WCAP-12472-P-A for a representative plant. It is seen that the higher the SPD measurement variability and fraction of inoperable detector are, the higher the peaking factor measurement uncertainty becomes. In most cases, the upper bound of the SPD measurement variability and fraction will be determined for a specified peaking factor measurement uncertainty. Alternatively, the BEACON methodology can be used to support an existing or requested availability requirement for a specific plant. 10. "The CETs are included in the IITA at Unit 2. This means that the Unit 2 CETs are physically located in different areas (radically and axially) than the Unit 1 thermocouples." In other words, this statement points out that a direct comparison of CET readings from Unit 1 and Unit 2 will be of little value. The Unit 2 CETs are located at the top of the active fuel inside the fuel assembly instrument thimble, instead of at the bottom of the upper core plate, so differences in temperature are to be expected between the units. Please note that these differences have been						

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					specifically considered in the applicable post-accident monitoring procedures. 11. The attached documents provide the assessment of potential interactions between the core exit thermocouples and the self powered detectors of the AP1000 Incore Instrumentation System. Note that APP-IIS-J0R-002 (ML102390521) is a non-proprietary version of APP-IIS-J0R-001. 12. To clarify, page 129 states that "the WINCISE system shall support two divisions of CET with a minimum of three thermocouples provided in each core quadrant for each division". In other words, there are at least three thermocouples per train per quadrant, or a minimum of six thermocouples per quadrant. 13. The IIS software functions are non-safety-related and have no impact on any safety function. Therefore software common mode failure analysis is not required. 15. There are two design changes that impact this system description. The responsible engineers agreed that the WINCISE change package (EDCR 52321) would address everything except the CETs and that the Common Q PAMS change package (EDCR 52351) would address the changes related to the CETS. As previously committed, the Common Q PAMS EDCR 52351-B will be submitted after the package is issued. Currently the package is scheduled to be issued May 12, 2011. 16. The changes are based on the installation of WINCISE in WBN Unit 2 as shown on page 115 of the attachment in the Revision No. 13 Description of Revision and in the Description of Change on pages 2 and 3 of the attachment.						
376	7.7.9		EICB (Alvarado)	DCI-CVIB Input: Reference—EDCR # 52321, Revision A—EDCR Unit Difference Form --- Bechtel Document Page 2 –Maintenance Difference— The proposed In-Core Instrument Thimble Assemblies (IITAs) which will replace Movable In-Core Detectable Systems (MIDs) have the following features: (1) IITAs are not fully extracted and they are held in a movable frame assembly. (2) IITAs exert lower vibration amplitude and therefore, aging degradation due to wear does not occur. (3) Loss of reactor coolant system pressure boundary due to breach of IITA outer sheath does not occur. **Question:**		16.	Response on Hold based on May 12 Rockville Public Meeting	Open-TVA/WEC			Related to OI 360

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				The staff believes that the licensee should provide an inspection program to confirm that the aforementioned attributes associated with IITAs are valid and this inspection program can be a part of a routine maintenance program. Replacement of 58 CETs for the current 65 CETs –to be addressed by the fuels division.							
377	7.7.9		EICB (Alvarado)	1. (a) Further explanation is required for the sentence in EDCR 52321 Rev A Page 2, "During certain accident scenarios, it is possible for the CETs to see temperatures up to 20 degree F different from Unit 1". (b) Which accident scenarios the above statements refer to? (c) Compare the accuracy for flux mapping with movable detectors (MIDS) and fixed detectors such as SPDs. 2. Explain how the linear heat generation rate is monitored using the new IITA system. 3. (a) Page 26 of the EDCR 52321-A states that "certain SPS electronics cannot withstand the increased pressure during an Integrated Leak Rate Testing (ILRT). As a result, these SPS electronics need to be removed prior to starting the ILRT." If SPS electronics does not survive an ILRT, what will be their status during a design basis accident, such as, loss of coolant accident? (b) Page 129 of EDCR 52321-A Item Number 7 CET Requirements states that "The CET must be operable before, during, and after a design basis accident without loss of safety function, and for the time required to perform the safety function." Does this CET requirement conflict with the scenario in Part (a) above, such that the malfunction of the electronics during high pressure during the design basis accident? 4. BEACON Power Distribution Monitoring System (PDMS) with WINCSE seems to be functioning different from old conventional BEACON monitoring system. Explain the differences between the new and old system and the advantages, if any, of the new system over the old one. 5. EDCR 52321-A Page 129 (WBN2-94-4003 Rev 0000 Page 18 of 41) "WINCISE Requirements" Sections 1 and 2 specify minimum requirements for inputs from SPDs such that "the WINCISE system shall not require input from 75% (50% for Section 2) of the instrumented locations, with at least five operable SPD associated with the top half of the active core and at least five operable SPD associated with bottom half of the active core per quadrant,…." Section 3 states that "The WINCISE System will be capable of performing its required core monitoring functions at or above 20% RTP." Provide documents supported by analyses that will show that the incore monitoring systems and the CET system will be fully capable of performing the intended functions under the circumstances prescribed in Sections 1, 2 and 3 of "WINCISE Requirements." 6. Section 6.0 of WCAP-12472-P-A Addendum 2-A stipulates		17.	Response on Hold based on May 12 Rockville Public Meeting	Open-TVA/WEC			

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				that in addition to maintaining power distribution Technical Specification that require surveillance of parameters related to hot rod power and local power density, it will be necessary for the licensees to include a BEACON Operability specification in the Technical Requirements Manual (TRM) associated with either the NUREG-1430 or NUREG-1432 format TS. Are the minimum requirements (50% and 75% of the instrument locations input) and functions of WINCISE and CET systems specified in Sections 1 through 6 of "WINSCISE Requirements" included in the WBN-2 Technical Specifications? If the answer is "no", explain why. Also, please provide the agency with a copy of the Technical Requirements Manual for the WINCISE system proposed for WBN-2 7. NRC Staff's search for references listed in Section 7 of EDCR 52321-A resulted in lack of any specific reference to Westinghouse Topical Report in the EDCR 52321-A. (a) Please specify which of the Addendums for WCAP 12472 Topical Report or any other Westinghouse TR is the basis for the planned WINCISE system to be installed at Watts Bar -2. (b) Provide the Agency with all relevant calculations and analyses supporting the proposed WINCISE system for Watts Bar 2.						
378			EICB (Alvarado)	Make the following WEC proprietary documents available for NRC review at the Westinghouse Rockville office: • WINCISE Functional Specification for Watts Bar Unit 2, 420A90, Rev. 2 • BEACON Data Processing Application Program Software Requirements Specification, WNA-DS-02196-WBT, Rev. 1 • Standard Fixed In-Core Detector Data Processing (PRLQFDO.2) Function Block Specification, WNA-DS-01400-GEN, Rev. 0 • Standard Vanadium Detector Filter (FBM.SPDO.2) Function Block Specification, WNA-DS-O 1402-GEN, Rev. 0 • IIS SPS Datalink Client Software Interface Specification, WNA-DS-02208-WBT, Rev. 1 • BEACON'" Datalink Interface Specification, WNA-DS-02194-WBT, Rev. 1 • ICS Datalink Interface Specification, WNA-DS-02193-WBT, Rev. 1 • Watts Bar 2 Incore Instrument System (IIS) Signal Processing System (SPS) Isolation Requirements, WNA-CN-00IS7-WBT, Rev. 0	Per Westinghouse letter WBT-D-3201, the documents are available for NRC review. The NRC can make arrangements to view these documents by contacting Ms. Leslie Collins at 301-881-7040 (e-mail: collinlj@westinghouse.com).	18.	Due 5/24/11	Closed-TVA/WEC			
379			(Alvar	Provide proprietary and non-proprietary versions of the WINCISE slides from the May 12 public meeting		19.	Due 6/17/11	Open-TVA/WEC			
380			EICB (Alvarado)	Provide Non-Proprietary functional description of the WINCISE Application Server including discussion on redundancy for both the servers and the configuration of the Beacon A/B computers		20.	Due 6/24/11	Open-TVA/WEC			
381			A l v	Non-Proprietary description of the qualification of the MI cable		21.	Due 6/24/11	Open-TVA/WEC			

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
				assemblies with references to any EQ report (if applicable) – **June 10th**							
382			(Al var	Non-Proprietary description of the qualification of the SPS cabinet with references to EQ report(s)		22.	Due 6/24/11	Open-TVA/WEC			
383			(Al var	Non-Proprietary description of the qualification of the IITA with references to EQ report(s)		23.	Due 6/24/11	Open-TVA/WEC			
384			EICB (Alvarado)	Non-Proprietary description of the differences between Unit 1 and Unit 2 core monitoring with references to Westinghouse documentation.		24.	Due 6/24/11	Open-TVA/WEC			
385			(Al var	Non-Proprietary description of the calc note shown to the NRC at the meeting.		25.	Due 6/24/11	Open-TVA/WEC			
386						26.					
387						27.					
388						28.					
389						29.					
390						30.					