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

August 15, 2012

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

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

Subject: **Watts Bar Nuclear Plant (WBN) Unit 2 – Status of Regulatory Framework for the Completion of Construction and Licensing for Unit 2 - Revision 8 (TAC No. MD6311), and Status of Generic Communications for Unit 2 - Revision 8 (TAC No. MD8314)**

Reference: 1. Letter from TVA to NRC dated December 20, 2011, "Watts Bar Nuclear Plant (WBN) Unit 2 – Status of Regulatory Framework for the Completion of Construction and Licensing for Unit 2 - Revision 7 (TAC No. MD6311), and Status of Generic Communications for Unit 2 - Revision 7 (TAC No. MD8314)" (ADAMS Accession No. ML11362A056)

This letter provides an updated status of the Regulatory Framework for the completion of construction and licensing activities for WBN Unit 2 as well as an updated status of Generic Communications for WBN Unit 2. TVA's last revision to these two status updates, Revision 7, was submitted on December 20, 2011 (Reference 1).

For the Regulatory Framework, Enclosure 1 provides the revised Regulatory Framework Master, and Enclosure 2 provides a version of the table showing only those items revised in this Revision 8.

For the Generic Communications, Enclosure 3 provides the revised Generic Communications Master, and Enclosure 4 provides a version of the table showing only those items revised in this Revision 8.

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The following is the status of the items which are applicable to WBN Unit 2. The status codes are defined on the last page of each enclosure.

STATUS	SER / SSER	GENERIC COMM.	TOTAL
C: CLOSED	245	145	390
CI: CLOSED / IMPLEMENTATION	17	87	104
CO: CLOSED - OPEN: Staff has approved closure of the item; however, TVA actions remain to be completed.	31	13	44
CT: CLOSED / TECHNICAL SPECIFICATIONS	0	0	0
O: OPEN	43	1	44
OI: OPEN / INSPECTION	1	0	1
OT: OPEN / TECHNICAL SPECIFICATIONS	1	0	1
OV: OPEN / VALIDATION	2	4	6
S: SUBMITTED	19	15	34
TOTAL	**359**	**265**	**624**

There are no new regulatory commitments associated with this submittal.

If you have any questions, please contact Gordon Arent at (423) 365-2004.

Respectfully,

R. A. Hruby, Jr.

Raymond A. Hruby, Jr.
General Manager, Technical Services
Watts Bar Unit 2

Enclosures:

1. SER and Supplements Review Matrix - Master Table

2. SER and Supplements Review Matrix - Revision 8 Changes

3. Generic Communications - Master Table

4. Generic Communications - Revision 8 Changes

cc (Enclosures):

U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Georgia 30303-1257

NRC Resident Inspector Unit 2
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Enclosure 1

SER and Supplements Review Matrix - Master Table

SAFETY EVALUATION REPORT AND SUPPLEMENTS (NUREG-0847) REVIEW MATRIX: MASTER TABLE

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
1.0.0		NA	Overview only
1.1.0		NA	Overview only
1.1.1		NA	Overview only
1.1.2		NA	Overview only
1.1.3		NA	Overview only
1.1.4		NA	Overview only
1.2.0		NA	Overview only
1.3.0		NA	Overview only
1.3.1		NA	Overview only
1.3.2		NA	Overview only
1.4.0		NA	Overview only
1.5.0		NA	Overview only
1.6.0		NA	Overview only

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
1.7.0		NA	Overview only
1.8.0		NA	Overview only
1.9.0		NA	Overview only
1.10.0		NA	Overview only
2.0.0	0	C	Approved for both units in SER.
2.1.0	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.1.1	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Page 1-3 of SSER22 has "3" in the "Note" column for this item. Note 3 reads, "In SSER 21, this issue was identified as 'Resolved.' However, TVA made changes to the Unit 2 FSAR affecting the previous staff conclusions. The staff evaluated the changes and the results are documented in this SSER." SSER22 shows the status for this item as "Resolved."
2.1.2	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Page 1-3 of SSER22 has "3" in the "Note" column for this item. Note 3 reads, "In SSER 21, this issue was identified as 'Resolved.' However, TVA made changes to the Unit 2 FSAR affecting the previous staff conclusions. The staff evaluated the changes and the results are documented in this SSER."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Resolved."
2.1.3	22	C 06	SRP requirement. Unit 2 Action: Update FSAR for present and projected population over the lifetime of the plant. REVISION 02 UPDATE: Status in SSER21 is Open (NRR). Amendment 94 to the Unit 2 FSAR was submitted on August 27, 2009. Part of this amendment revised population information in Section 2.1.3. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.1.4	22	C 06	"CONCLUSIONS" left open until all items in subsection are closed. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.2.0	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.2.1	22	C 06	SRP requirement. Unit 2 Action: Update FSAR for potential external hazards and hazardous materials. REVISION 02 UPDATE: Status in SSER21 is Open (NRR). Amendment 94 to the Unit 2 FSAR was submitted on August 27, 2009.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Part of this amendment revised the description of hazardous material shipped past the plant in Section 2.2.2.2. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.2.2	22	C 06	SRP requirement. Unit 2 Action: Update FSAR for projected annual number of aircraft flights. REVISION 02 UPDATE: Status in SSER21 is Open (NRR). Amendment 94 to the Unit 2 FSAR was submitted on August 27, 2009. Part of this amendment revised information concerning airports and numbers of aircraft flights in Section 2.2.2.5. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.2.3	22	C 06	"CONCLUSIONS" left open until all items in subsection are closed. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.3.0	0	C	Approved for both units in SER.
2.3.1	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: 2.3.1 of SSER22 includes: "In Section 2.3.1 of FSAR Amendment 101 (ADAMS Accession No. ML103140314), TVA provided revised information on average and limiting values associated with tornadoes, strong winds and storms, hail, lightning, and snowfall resulting from consideration of the more recently measured NCDC and WBN site data.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			TVA also updated the assessment of the probability that a tornado would strike the WBN site and the associated recurrence interval. TVA's current estimate of tornado strike probability, ... Based on sampling the revised information provided by TVA, the NRC staff has concluded that TVA used acceptable references and information to develop the updates." SSER22 shows the status for this item as "Resolved."
2.3.2	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: 2.3.2 of SSER22 includes: "In Section 2.3.2 of WBN FSAR Amendment 101, dated October 29, 2010, TVA revised information on average and limiting values associated with temperature, precipitation, snowfall, atmospheric water vapor content, fog, and onsite wind measurements resulting from consideration of the more recently measured NCDC and WBN site data. Based on sampling the revised information provided, the NRC staff has concluded that TVA used acceptable references and information to develop the updates." SSER22 shows the status for this item as "Resolved."
2.3.3	25	C 08	See 13.3.3 (Emergency Preparedness Evaluation Conclusions). REVISION 06 UPDATE: 2.3.3 of SSER22 includes: "TVA described several updates in equipment and procedures. TVA also stated that it developed the WBN onsite meteorological program to be consistent with the guidance given in RG 1.23, Revision 1, "Meteorological Monitoring Programs for Nuclear Power Plants," issued March 2007, which is a revision from the previous phase of the program, developed to be consistent with the guidance in RG 1.23, Revision 0, "Onsite Meteorological Programs," issued February 1972. The NRC staff finds the use of this RG version acceptable. In addition, TVA provided tables of joint windspeed, wind direction, and atmospheric stability data for onsite meteorological measurements made from 1974 through 1993. SSER 15 (ADAMS Accession No. ML072060488) discussed these data, but the tables, which are an update of previous tables for 1974 through 1988, were not included in prior amendments because of an oversight. The NRC staff finds this replacement acceptable." SSER22 shows the status for this item as "Resolved." REVISION 08 UPDATE: 2.3.3 of SSER25 includes: "Meteorological data summarized in the JFD formats were reasonably consistent with the data provided in the hourly data summary formats. On the basis of this review, the NRC staff concluded that the data files provided by TVA for 1991 through 2010 give an adequate representation of the site conditions to facilitate

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			calculation of the CR, EAB, and LPZ χ/Q values for DBA and χ/Q and D/Q values for routine release dose assessments for WBN Unit 2. The JFD summary for the data from 1991 through 2010 provided by letter dated November 7, 2011, and a discussion of the long-term representativeness of these data should be provided in the WBN Unit 2 FSAR. Upon receipt of the updated FSAR, the NRC staff will confirm that these updates have been made by TVA. This is Open Item 136 (Appendix HH)." SSER25 shows the status for this item as "Resolved."
2.3.4	25	CO --- 08	TVA updated information on portions of the metrology program in FSAR amendment 83. This was reviewed and found acceptable in SSER14. --- --- REVISION 06 UPDATE: 2.3.4 of SSER22 includes: "The NRC staff previously addressed this section in SSER 15. TVA revised the reference number for Table 2.3-64a to Table 2.3-65. The NRC staff finds this change to be editorial and, therefore, acceptable." SSER22 shows the status for this item as "Resolved." --- --- REVISION 08 UPDATE: 2.3.4 of SSER25 includes: "In its letter dated September 15, 2011, TVA stated that it would revise FSAR Section 15.5 in a future amendment to reflect the χ/Q values presented in that letter. TVA reflected the EAB and LPZ χ/Q values from its letter dated June 27, 2011, in FSAR Amendment 105, dated August 12, 2011 (ADAMS Accession No. ML11236A158). The NRC staff will confirm, upon receipt, that TVA integrated the updated CR χ/Q values from its letter dated September 15, 2011, into a future amendment of the FSAR. This is Open Item 137 (Appendix HH)." --- SSER25 shows the status for this item as "Resolved."
2.3.5	25	CO --- 08	TVA updated information on portions of the metrology program in FSAR amendment 83. This was reviewed and found acceptable in SSER14. --- --- REVISION 08 UPDATE: 2.3.5 of SSER25 includes: "The updated annual average χ/Q and D/Q values associated with the specific receptor locations appear in Table 11.3-8, and the sets of values for the 16 radial sectors are in Tables 2.3-75A and 2.3-75B, of FSAR Amendment 104, dated June 3, 2011 (ADAMS Accession No. ML11178A155). In addition, in FSAR Section 2.3.5, TVA stated that it discussed this topic in the WBN Offsite Dose Calculation Manual (ODCM). FSAR Section 11.3 also discusses this topic. Upon receipt of the updated ODCM, the NRC staff will confirm that TVA made the corresponding revisions related to the updated annual average χ/Q and D/Q values. This is Open Item 138 (Appendix HH). "

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			---------- SSER25 shows the status for this item as "Resolved."
2.4.0	0	C	Approved for both units in SER.
2.4.1	0	C	Approved for both units in SER.
2.4.2	0	C	Approved for both units in SER.
2.4.3	0	O 02	---------- REVISION 02 UPDATE: Approved for both units in SER.
2.4.4	0	C	Approved for both units in SER.
2.4.5	0	C	GL 89-22, "Potential For Increased Roof Load Due to Changes in Maximum Precipitation" – Answer to informal question provided in TVA letter dated December 16, 1981, and subsequently included in FSAR. GL did not require a response. No further action required.
2.4.6	0	C	Approved for both units in SER.
2.4.7	0	C	Approved for both units in SER.
2.4.8	21	O 02	CONFIRMATORY ISSUE for design basis groundwater level for ERCW pipeline Amendment 50 to the FSAR (May 1, 1984) provided a description of the analysis used to determine the 25-year groundwater level for the ERCW pipeline. Staff closed issue in SSER3. ---------- REVISION 02 UPDATE: Status in SSER21 is "Open (NRR)."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
2.4.9	22	C 06	SRP requirement. Unit 2 Action: Update FSAR for present and projected use of local and regional groundwater. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 06 UPDATE: Amendment 93 to the Unit 2 FSAR was submitted on April 30, 2009. Part of this amendment updated the name of one of the downstream surface water intakes in Section 2.4.12.2. Section 2.4.9.2 of SSER22 includes: "The NRC staff has concluded that the change to the name of the intake is administrative and did not affect the location or relative concentration result associated with the intake. Since the change does not affect the conclusions identified in the FSAR, the staff finds it acceptable." SSER22 shows the status for this item as "Resolved."
2.4.10	24	O 07	Staff found flood emergency plan and draft Technical Specifications acceptable in original 1982 SER. Unit 2 Action: Address in Technical Specifications as appropriate. REVISION 02 UPDATE: Status in SSER21 is Open (Inspection). Amendment B of the Technical Requirements Manual (TRM) was submitted on February 2, 2010. TRM TLCO 3.7.2 provides the Flood Protection Plan. REVISION 07 UPDATE: 2.4.10 of SSER24 includes: "As described above, the staff reviewed TVA's response to EMCB-RAI-1 and the revised Figure 2.4-72 and found them acceptable. In order to confirm the stability analysis of the sand baskets used by TVA in the WBN Unit 2 licensing basis, TVA will perform either a hydrology analysis without crediting the use of the sand baskets at the Fort Loudoun dam for the seismic dam failure and flood combination, or TVA will perform a seismic test of the sand baskets, as stated in TVA's letter dated April 20, 2011. TVA will report the results of this analysis or test to the NRC by October 31, 2011. This is Open Item 133 (Appendix HH)." AND "TVA should provide the NRC staff with supporting technical justification for the statements in Amendment 104 of FSAR Section 2.4.4.1, 'Dam Failure Permutations,' page 2.4-32 (in the section 'Multiple Failures')

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			that, 'Fort Loudoun, Tellico, and Watts Bar have previously been judged not to fail for the OBE (0.09 g). Postulation of Tellico failure in this combination has not been evaluated but is bounded by the SSE failure of Norris, Cherokee, Douglas and Tellico.' This is Open Item 134 (Appendix HH). Conclusions As discussed above, the NRC staff verified that TVA's changes in FSAR Section 2.4 are acceptable because they are consistent with the latest available information from the U.S. Army Corps of Engineers, Hydrologic Engineering Center; the National Weather Service document, 'Probable Maximum and TVA Precipitation Estimates with Areal Distribution for Tennessee River Drainages Less Than 3,000 Square Miles in Area,' and the U.S. Geological Survey, National Water Information System. Based on the staff's review of Amendment 104 to WBN Unit 2 FSAR Section 2.4.3 and the information provided by TVA in its letters dated April 20 and May 20, 2011, TVA adequately addressed the staff's questions regarding the dependence of the predicted PMF on the temporary modifications (sand baskets) currently in place at the dams in the vicinity of WBN. As discussed above, the staff proposes two license conditions related to the flooding protection at Watts Bar Unit 2. Flooding Protection Proposed License Condition No. 1: TVA will submit to the NRC staff by August 31, 2012, for review and approval, a summary of the results of the finite element analysis, which demonstrates that the Cherokee and Douglas dams are fully stable under design basis probable maximum flood loading conditions for the long-term stability analysis, including how the preestablished acceptance criteria were met. Flooding Protection Proposed License Condition No. 2: TVA will submit to the NRC staff, before completion of the first operating cycle, its longterm modification plan to raise the height of the embankments associated with the Cherokee, Fort Loudoun, Tellico, and Watts Bar dams. The submittal shall include analyses to demonstrate that, when the modifications are complete, the embankments will meet the applicable structural loading conditions, stability requirements, and functionality considerations to ensure that the design basis probable maximum flood limits are not exceeded at the Watts Bar Nuclear Plant. All modifications to raise the height of the embankments shall be completed within 3 years from the date of issuance of the operating license." ---------- Open Item 134 Appendix HH) reads as follows: "TVA should provide to the NRC staff supporting technical justification for the statements in Amendment 104 of FSAR Section 2.4.4.1, 'Dam Failure Permutations,' page 2.4-32 (in the section 'Multiple Failures') that, 'Fort Loudoun, Tellico, and Watts Bar have previously been judged not to fail for the OBE (0.09 g). Postulation of Tellico failure in this combination has not been evaluated but is bounded by the SSE failure of Norris, Cherokee, Douglas and Tellico.' (SSER 24, Section 2.4.10)"
2.4.11		NA	Addressed in 2.4.6.
2.4.12		NA	Addressed in 2.4.7.
2.4.13		NA	Addressed in 2.4.9.
2.4.14		NA	Addressed in 2.4.10.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
2.5.0	24	C 07	Approved for both units in SER. REVISION 07 UPDATE: 2.5 of SSER24 includes: "Summary and Conclusion The NRC staff reviewed Amendment 95 of WBN Unit 2 FSAR Section 2.5.4, 'Properties of Subsurface Materials and Foundations,' and noted some changes that required clarification. Based on its review of TVA's responses, the staff concluded that TVA's responses were acceptable, because the typographical errors that occurred during the change from one electronic format to another were corrected by Amendment 98. Since there are no substantive changes to WBN Unit 2 FSAR Sections 2.5 through 2.5.5 since the NRC staff approved the sections during the licensing for WBN Unit 1, the sections are acceptable." SSER24shows the status for this item as "Resolved."
2.5.1	0	C	Approved for both units in SER.
2.5.2	0	C	Approved for both units in SER.
2.5.3	0	C	Approved for both units in SER.
2.5.4	11	C 03	CONFIRMATORY ISSUE for design differential settlement of piping and electrical components Analysis was presented to staff in September 1983. Staff found analysis and results acceptable. Staff closed issue in SSER3. CONFIRMATORY ISSUE for analysis of sheetpile walls Staff performed audit in September 1982, and determined TVA had used reasonable assumptions. Staff closed issue in SSER3. CONFIRMATORY ISSUE for material and geometric damping in soil-structure interaction (SSI) analysis Staff performed audit in September 1982, and determined TVA had used reasonable assumptions. Staff closed issue in SSER3. OUTSTANDING ISSUE (1) on liquefaction beneath ERCW pipelines and Class 1E electrical conduit. Amendment 50 to the FSAR (May 1, 1984) provided a description of the underground barriers along the ERCW pipelines. Staff agreed the barriers provide sufficient confinement to any liquefied soil. Staff closed issue in SSER3.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			--- FSAR amendment 54-63 was reviewed in SSER9. NRC determined that the conclusions previously issued in the SER and SSER3 remained unchanged. --- The Special Program (SP) for Soil Liquefaction was reviewed in SSER11. NRC IR 50-390/92-45 and 50-391/92-45 concluded that TVA had correctly implemented the SP and that it was closed. SSER11 accepted the implementation for WBN Unit 1. Per TVA letter dated August 3, 2007, implementation of the Soil Liquefaction SP is complete for both units. --- --- REVISION 03 UPDATE: NRC IR 50-391/2009-605 noted that the Soil Liquefaction SP was closed for Unit 2.
2.5.5	0	C	Approved for both units in SER.
2.5.6	0	C	Approved for both units in SER.
2.6.0	22	C 06	Approved for both units in SER. --- --- REVISION 06 UPDATE: Section 2.6 of SSER22 includes: "The staff reviewed Chapter 2 of the original WBN FSAR, dated September 27, 1976 ... and determined that the FSAR has never contained a Section 2.6."
3.0.0	0	C	Approved for both units in SER.
3.1.0	0	C	Approved for both units in SER.
3.1.1	0	C	Approved for both units in SER.
3.1.2	0	C	Approved for both units in SER.
3.2.0	14	C	In SSER14, the staff reviewed revisions to Table 3.2-2, "Summary of Criteria - Mechanical System Components", and found the table acceptable.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
		01	
3.2.1	8	C 01	CONFIRMATORY ISSUE for seismic classification of structures, systems, and components important to safety The staff reviewed Amendment 49 to FSAR and actions implemented by TVA to address ERCW seismic classification in SSER3 and found them acceptable, pending verification of actions. Staff closed issue on ERCW seismic category upgrade and seismic classification in SSER5. ---------- CONFIRMATORY ISSUE for ERCW upgrade to seismic category 1 Staff verified that required portion of ERCW had been upgraded or replaced satisfactorily in SSER5 and closed this issue. ---------- In SSER6, the staff addressed and resolved an issue on Category I boundary. ---------- OUTSTANDING ISSUE involving seismic classification of cable trays and conduits In SSER6, staff identified an issue on seismic classification of cable trays and conduits being categorized as I(L). In its May 8, 1991, letter, TVA proposed to analyze conduits as Seismic Category I subsystems. Additionally, in a September 18, 1991 letter, TVA agreed to perform cable tray qualification using conventional linear elastic analysis methods, considering nonlinear response behavior on a case-by-case basis and to submit these cases to the staff for approval. The staff resolved this issue in SSER8.
3.2.2	21	CI 02	Section 3.2.2 of SSER3 discusses confirmatory issues for seismic classification and upgrade of ERCW that are already included in 3.2.1. ---------- Staff accepted implementation of Heat Code Traceability CAP for Unit 1 in SSER7. Unit 2 Action: Complete CAP using Unit 1 approach. ---------- Staff reviewed updated information in Amendment 68 on use of codes and standards in SSER9 and stated that prior conclusions were unchanged. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Heat Code Traceability CAP. In SSER21, the Heat Code Traceability CAP was resolved. Completion of Heat Code Traceability CAP is tracked under 23.2.9.
3.3.0	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
3.3.1	0	C	Approved for both units in SER.
3.3.2	0	C	Approved for both units in SER.
3.4.0	0	C	Approved for both units in SER.
3.4.1	0	C	Approved for both units in SER.
3.4.2		NA	Addressed in 3.4.1.
3.5.0	0	C	Approved for both units in SER.
3.5.1	22	C 06	In SSER9, the staff determined that a new spectrum used for the design of a new DG building and other Category I structures built after 1979 was acceptable. In SSER14, clarification in Amendment 79 on internal missile sources was reviewed and did not change prior conclusions. Staff also reviewed revised information on turbine missiles and concluded that impact of potential missiles was insignificant. REVISION 06 UPDATE: Section 3.5.1.3 of SSER22 includes: "During its review, the NRC staff identified an open item to review TVA's testing frequency of once every 6 months for turbine valves. ... Since TVA's calculations used NRC-approved methodology and had a large margin of safety between the calculated P1 value and the NRC criterion, the NRC staff finds that the proposed test frequency of once every 6 months for turbine valves is acceptable, and the open item is closed." SSER22 shows the status for this item as "Resolved."
3.5.2	22	C 06	CONFIRMATORY ISSUE for modifications to protect Diesel Generators TVA submitted a proposed design modification for installation of a reinforced concrete curb around the diesel exhaust stacks to protect them from damage in a letter dated November 24, 1982. The staff found this acceptable and closed this issue in SSER2. REVISION 06 UPDATE:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Section 3.5.2 of SSER22 includes: "Based on its review of Section 3.5.2 of Amendment 97 to the WBN FSAR, the NRC staff concludes that those SSCs identified by TVA as requiring protection from externally generated missiles conform to the relevant regulatory requirements and are, therefore, acceptable." SSER22 shows the status for this item as "Resolved."
3.5.3	0	C 01	Approved for both units in SER.
3.6.0	21	CI 02	In SSER6, the staff accepted TVA approaches involving arbitrary intermediate breaks, determination of intermediate break locations and analysis of jet impingement loads. In SSER11, the staff reviewed results of the MELB Special Program and determined that the conclusion in the SER finding plant design for protection against piping failures outside containment was still valid. Unit 2 Action: Complete Special Program using the Unit 1 approach. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the MELB SP. In SSER21, the MELB Special Program was resolved. Completion of MELB SP is tracked under 23.3.8.
3.6.1	22	C 06	OUTSTANDING ISSUE involving main steam line break (MSLB) outside containment In a letter dated November 30, 1992, TVA submitted a new evaluation for both Units 1 and 2 accounting for increased environmental temperatures in the MSVV rooms due to release of superheated steam and later submitted, by letter dated March 28, 1994, additional information related to the assumptions made in this analysis for both units. The staff reviewed this information together with their detailed evaluation and acceptance of the same methodology applied at Sequoyah and concluded that the MSLB analysis for the WBN MSVV rooms, including the effects of superheated steam, was acceptable and identified this issue as resolved in SSER14. --- In SSER14, the staff reviewed the construction of response spectra for the steel containment vessel resulting from the compartment pressure transients caused by pipe break and TVA modeling of the SCV for both units (see TVA letter dated December 30, 1993) and concluded that the methodology for obtaining shell dynamic displacements and construction of spectra were acceptable. --- --- REVISION 02 UPDATE: Status in SSER21 is Open (NRR). --- ---

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 06 UPDATE: 3.6.1 of SSER22 includes: "Therefore, the staff concludes that the design meets the requirements of GDC 4 regarding protection against pipe failures in fluid systems outside containment and is acceptable." SSER22 shows the status for this item as "Resolved."
3.6.2	22	C --- 06	The 3.6.2 discussion in SSER14 on response spectra for the SCV refers to the evaluation provided in 3.6.1. REVISION 06 UPDATE: Page 1-5 of SSER22 has "3" in the "Note" column for this item. Note 3 reads, "In SSER 21, this issue was identified as 'Resolved.' However, TVA made changes to the Unit 2 FSAR affecting the previous staff conclusions. The staff evaluated the changes and the results are documented in this SSER." Section 3.6.2 of SSER22 includes: "Therefore, the staff finds TVA's changes and modifications to Section 3.6B.2 of FSAR Amendment 95 to be acceptable." SSER22 shows the status for this item as "Resolved."
3.6.3	24	C --- 07	New section in SRP 1987. Approved for both units in Appendix J of SSER5. The staff concluded in SSER12 that TVA may eliminate pressurizer surge line rupture from the design basis for Units 1 and 2. REVISION 06 UPDATE: 3.6.3 of SSER22 includes: "The leak before-break evaluation methods are consistent with SRP Section 3.6.3 and are, therefore, acceptable, pending the resolution of Open Item 15 regarding the completion of PWSCC mitigation activities." SSER22 shows the status for this item as "Open (NRR)." REVISION 07 UPDATE: 3.6.3 of SSER 24 includes: "Since TVA confirmed that it has committed to Electric Power Research Institute (EPRI) Material Reliability Program (MRP)-139, Revision 1, December 2008, and used the MSIP® process, as documented in WBN Unit 2 FSAR Section 5.5.3.3.1, the NRC staff concludes that TVA has completed reasonable PWSCC mitigation activities on the Alloy 600 DMBWs in the primary loop piping. Therefore, Open Item 15 is closed."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER24 shows the status for this item as "Resolved."
3.7.0	21	C 03	The staff concluded in SSER6 that FSAR section 3.7 which was added to describe Set A, Set B and Set C seismic analysis was consistent with the Seismic Analysis CAP. Unit 2 Action: Complete CAP using the Unit 1 approach. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Seismic Analysis CAP . In SSER21, the Seismic Analysis CAP was resolved. Completion of the Seismic Analysis CAP is tracked under 23.2.16. REVISION 03 UPDATE: NRC IR 50-391/2010-602 noted that the Seismic Analysis CAP was closed for Unit 2.
3.7.1	21	C 03	OUTSTANDING ISSUE involving update of FSAR for seismic design issues The staff reviewed FSAR Amendment 68 and found that required changes had been incorporated into the FSAR, as committed to in TVA letter dated December 18, 1990, for Units 1 and 2, and issue was deemed resolved in SSER6. SSER9 stated the Seismic Analysis CAP was acceptably implemented for Unit 1. SSER16 discusses use of a vertical PGA of .15g rather than .18g for Set B spectra and determined that it was acceptable. Unit 2 Action: Complete CAP using Unit 1 approach. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Seismic Analysis CAP . In SSER21, the Seismic Analysis CAP was resolved. Completion of the Seismic Analysis CAP is tracked under 23.2.16. REVISION 03 UPDATE: NRC IR 50-391/2010-602 noted that the Seismic Analysis CAP was closed for Unit 2.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
3.7.2	21	C 03	3.7.2.1.2: OUTSTANDING ISSUE involving mass eccentricity In a letter dated May 8, 1991, for Units 1 and 2, TVA provided clarification that actual mass eccentricities from such items as equipment hatch and lock used in evaluating the steel containment vessel for an earthquake load were replaced by a 5% accidental eccentricity. This was demonstrated to be conservative. TVA also proposed a revision to the FSAR to document this change. The staff found this acceptable and resolved this issue in SSER8. ---------- 3.7.2.1.2: OUTSTANDING ISSUE involving comparison of Set A vs. Set B response The staff considered this item (opened in SSER6) resolved in SSER11 based on audits and inspections since SSER6. Unit 2 Action: Complete Seismic Analysis CAP using the Unit 1 approach. ---------- In SSER16, the staff discussed the review and acceptability of the NSSS-ICS modeling for seismic analysis. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Seismic Analysis CAP . In SSER21, the Seismic Analysis CAP was resolved. Completion of the Seismic Analysis CAP is tracked under 23.2.16. ---------- ---------- REVISION 03 UPDATE: NRC IR 50-391/2010-602 noted that the Seismic Analysis CAP was closed for Unit 2.
3.7.3	22	C 06	OUTSTANDING ISSUE involving number of peak cycles to be used for OBE In SSER6, the staff identified an issue involving the number of peak cycles to be used for OBE. In a letter dated May 8, 1991, for both units, TVA proposed to revise the FSAR for ASME Section III Class I piping analysis to include the assumption of 5 OBEs and 1 SSE and a minimum of 10 peak stress cycles per event. The staff accepted this in SSER8. ---------- OUTSTANDING ISSUE involving use of code cases, damping factors for conduit and use of worst case, critical case and bounding case In SSER6, the staff identified outstanding issues involving code case use, damping factors for conduit and use of worst case, critical case and bounding case. Deficiencies identified in the use of worst case, critical case and bounding calculations were resolved in IR 50-390/93-201, and this issue was considered resolved for Unit 1 in SSER12. Unit 2 Action: Addressed in CAP/SP. The Unit 1 approach will be used for Unit 2. ----------

* = See last page for status code definition.

OUTSTANDING ISSUE involving 1.2 multi mode factor

In SSER6, the staff identified an issue involving a 1.2 multi-mode factor. In SSER8, the staff continued to review the use of a multi-mode factor of 1.2. The staff reviewed verification studies performed by TVA to justify the use of a 1.2 multi-mode factor in seismic evaluation of certain sub systems in SSER8 and SSER9 and, after TVA provided further confirmation of supporting calculations, the use of Complete Quadratic Combinations and validity of two degree of freedom predictions in a letter dated October 10, 1991, for both units, the staff considered this issue resolved in SSER9.

Conduit Supports Corrective Action Program. Process was reviewed and determined to be acceptable for Unit 1 in SER dated September 1, 1989.

Unit 2 Action: Addressed in CAP/SP. The Unit 1 approach will be used for Unit 2.

In SSER6, the staff reviewed several other seismic analysis considerations including combination of components of earthquake motion, use of load factors in simplified analysis of equipment, consideration of torsional effects of eccentric masses in piping analysis; damping values for cable trays, HVAC and equipment and components; analysis of mounting for equipment and components; and loads and load combinations used in design of HVAC ducts and supports and found them acceptable.

In SSER7, the staff reviewed the seismic design of the Refueling Water Storage Tank, the only safety related above ground vertical steel tank in the plant, and found it acceptable.

REVISION 02 UPDATE:

The status in SSER21 is "Open (NRR)."

TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Seismic Analysis CAP and the Conduit Supports CAP.

In SSER21, the Seismic Analysis CAP was resolved. Completion of the Seismic Analysis CAP is tracked under 23.2.16.

In SSER21, the Conduit Supports CAP was resolved. Completion of the Electrical Conduit and Conduit Supports CAP is tracked under 23.2.16.

REVISION 03 UPDATE:

NRC IR 50-391/2010-602 noted that the Seismic Analysis CAP was closed for Unit 2.

REVISION 06 UPDATE:

Section 3.7.3.18 of SSER22 includes:

"Since WBN Units 1 and 2 share a common control room, TVA has applied to Unit 2 the Unit 1 methodology of qualifying the main control room components. The NRC staff has reviewed TVA's submittal and confirmed that the methodology and results pertaining to Unit 1 are applicable to Unit 2. Therefore, the staff considers this section resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Resolved."
3.7.4	0	C	Approved for both units in SER.
3.8.0	21	O 02	OUTSTANDING ISSUE involving load combinations and stress allowables In response to staff concerns regarding use of ductility ratio when considering thermally induced stresses, TVA stated in a letter dated April 6, 1992, for both units, that they would use a methodology consistent with SRP 3.8.4 for the design of steel members and use the linear elastic provision of DG-C 1.6.12, Rev. 1, "Evaluation of Steel Structures with Thermal Restraint," except for the energy balance provision of Section C.2.3.1. The staff found this acceptable. TVA also agreed, in its May 8, 1991, letter for both units, that any further sampling of structural welds after the issuance of NCIG-2, Rev. 2 would be to that revision. This issue was resolved in SSER9. REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
3.8.1	3	C 01	CONFIRMATORY ISSUE - verify buckling methodology In response to staff concern, TVA submitted a letter dated May 16, 1984, for both units, stating that TVA calculations already accounted for new information from NRC-sponsored research programs, particularly information concerning reinforcement around shell (vessel) opening. Based on their review of the response, the staff closed this issue in SSER3.
3.8.2	7	C 01	The staff accepted implementation of the Concrete Quality Special Program for Unit 1 in SSER7. This program is considered closed for Unit 2 based on the work performed for Unit 1. The was identified in a TVA letter dated August 3, 2007, WBN - Unit 2 - Reactivation of Construction Activities
3.8.3	21	O 02	The staff reviewed materials, allowable stresses and load cases for the watertight equipment hatch cover in an FSAR Table in Amendment and found them acceptable for both units in SSER14. The staff reviewed allowable stresses for Category I structural steel and found them acceptable for both units in SSER16. REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
3.8.4	0	C	Approved for both units in SER.
3.9.0	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
3.9.1	22	CO 06	OUTSTANDING ISSUE involving assumption in piping analysis for water-hammer due to check valve slam In SSER6, the NRC expressed concern regarding TVA's piping analysis that postulated failure of certain supports. TVA submitted an August 4, 1992, letter stating that, where possible, supports were upgraded in the analysis to maintain structural integrity during the postulated loading scenario. The issue was resolved in SSER13. Unit 2 Action: Modify supports as needed. REVISION 06 UPDATE: 3.9.1 of SSER22 includes: "Based on the review of Section 3.9.1 of Amendment 97 to the WBN Unit 2 FSAR, as described above, the NRC staff concludes that TVA complies with the regulatory requirements relevant to this section. Therefore, the open item (SSER 6 OI 20(a) for Section 3.9.1) is closed." SSER22 shows the status for this item as "Resolved."
3.9.2	22	C 06	The staff reviewed "Pre-operational Vibration and Dynamic Effects Testing on Piping", and found this area acceptable in SSER14. REVISION 06 UPDATE: 3.9.2 of SSER22 includes: "Based on the review of Section 3.9.2 described above, the NRC staff concludes that TVA complies with the regulatory requirements relevant to this section." SSER22 shows the status for this item as "Resolved."
3.9.3	22	C 06	3.9.3.1: OUTSTANDING ISSUE involving use of experience data to qualify category I(L) piping The staff identified a concern regarding the use of experience data as a method of seismic qualification of Category I(L) piping in SSER6. TVA stated in a letter dated December 18, 1990 for both units, that it was performing a verification program to validate the original seismic design basis for Category I(L) piping, including a screening criteria based on earthquake experience data to identify items requiring further evaluation and bounding case analysis to demonstrate the conservatism of the screening criteria. In a September 20, 1991, for both units, letter, TVA provided revised criteria for the bounding case analysis. Based on the staff's evaluation, the issue was considered resolved in SSER8. 3.9.3.3: LICENSE CONDITION - Relief and safety valve testing (II.D.1) Staff found TVA approach in response to this issue, using information from EPRI valve test program and performing modifications to safety and relief discharge piping and supports, was acceptable. Issue was considered resolved in SSER3. 3.9.3.3: OUTSTANDING ISSUE involving operating characteristics of main steam safety valves The staff identified a concern with operating characteristics of main steam safety valves in SSER6. In a

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letter dated June 21, 1991, TVA responded to NRC concerns regarding the design and installation of MSSVs stated that all valves and piping components were analyzed for all MSSV discharge loads acting simultaneously, combined with other required loads and this was accepted by the staff. In the same letter, TVA also provided the method used to establish the MSSV adjustment ring settings for plant valves and this was acceptable to the staff. This resolved the issue in SSER7.

Unit 2 Action: Provide basis of applicability of Unit 1 MSSV analysis to Unit 2.

3.9.3.4: CONFIRMATORY ISSUE involving baseplate flexibility and its effect on anchor bolt loads

The staff continued to review baseplate flexibility and its effect on anchor bolt loads. The issue remained open in SSER6. The TVA response to this issue, in a letter dated July 26, 1991, for both units, described an update to the previous response for B 79-02 and its civil design standard for concrete anchorage, which incorporated an increase in anchor stiffness and consideration of prying forces for thin baseplates analyzed by hand. The staff determined that this adequately resolved the issue in SSER8.

3.9.3.4: OUTSTANDING ISSUE involving stiffness and deflection limits for seismic Category I pipe supports

The staff questioned new support stiffness and deflection limits for seismic Category I pipe supports in SSER6. The TVA program to demonstrate that change in design criteria which uses stiffness and deflection limits for Category I pipe supports did not compromise the adequacy of pipe supports, was submitted in a TVA letter dated September 30, 1991, for both units, and was found to be acceptable by the staff and the issue was resolved in SSER8.

3.9.3.4: OUTSTANDING ISSUE, staff was awaiting TVA concurrence on their position with respect to margin for critical buckling of pipe supports

In a letter dated May 14, 1984, TVA provided results of a sampling program and determined that compressive stresses for pipe supports did not exceed acceptance criteria established by NRC and staff considered this issue resolved in SSER4.

The staff reviewed proposed new criteria for service load combinations and associated stress limits for ASME Code Class 1, 2, and 3 pipe supports in SSER6 and found them acceptable.

In SSER15, the staff found the response to NUREG-0737, Item II.D.1, "Performance Testing of Relief and Safety Valves," acceptable.

REVISION 02 UPDATE:

TVA determined that the Unit 1 MSSV analysis was applicable to Unit 2.

Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009.

Section 10.1 was amended to reference the Westinghouse safety evaluation that evaluated the effect of the MSSV blowdown on the LOCA related FSAR analysis results.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 06 UPDATE: Section 3.9.3 of SSER22 includes: "Based on its review of Section 3.9.3 of Amendment 97 to the WBN Unit 2 FSAR, as described above, the NRC staff concludes that TVA complies with the regulatory requirements relevant to this section." SSER22 shows the status for this item as "Resolved."
3.9.4	0	C	Approved for both units in SER.
3.9.5	23	O 07	Approved for both units in SER. REVISION 07 UPDATE: 3.9.5 of SSER23 includes: "Based on its review of the information provided by TVA as discussed above, the NRC staff concludes that the RVI components in WBN Unit 2 are consistent with the previously NRC-approved components in WBN Unit 1. Therefore, the staff concludes that the WBN Unit 2 RVI components listed in Section 4.2.2 of FSAR Amendment 95 are acceptable, pending the resolution of Open Item 71. Additionally, TVA's compliance with the ASME Code requirements for design and inspection provides adequate assurance that the licensee will maintain the level of quality and safety for the RVI components during the current license period." SSER23 shows the status for this item as "Open." Open Item 71 (Appendix HH) reads as follows: "By letter dated April 21, 2011 (ADAMS Accession No. MLI 11110513), TVA withdrew its commitment to replace the Unit 2 clevis insert bolts. TVA should provide further justification for the decision to not replace the bolts to the NRC staff. (Section 3.9.5)"
3.9.6	22	O 06	LICENSE CONDITION on inservice testing of pumps and valves The staff stated that they were reviewing TVA's response to GL 89-04, addressing acceptable IST programs and the license condition on inservice testing of pumps and valves remained open in SSER5. TVA committed to submit a revised ASME Section XI Inservice Pump and Valve Test Program six months before the projected date of operating license issuance in an August 21, 1989, letter. On this basis, the staff considered that the proposed license condition was no longer required in SSER12. OUTSTANDING ISSUE required that Technical Specifications include limiting condition for operation that requires plant shutdown or system isolation when leak limits are not met. Staff had not reviewed Technical Specifications. The safety evaluation in SSER14 states that the staff did not find any IST issues that would prevent issuance of an operating license for Unit 1. The item was resolved in SSER14. Unit 2 Action: Submit Technical Specifications.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			In SSER18, the staff approved a proposed alternative for set pressure testing of the three pressurizer safety relief valves that provide overpressure protection for the reactor coolant system. In SSER20, the staff discussed 13 issues that remained to be resolved for the pump and valve inservice testing program and stated that they had been addressed in a manner that complies with the staff's position and they granted relief for an additional relief request. REVISION 02 UPDATE: Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. TS LCO 3.4.13 provides the requirements for RCS Operational Leakage. Included in this is a requirement to shutdown the unit if leakage can not be reduced to within limits within the specified time frame. TS LCO 3.4.14 provides the requirements for RCS Pressure Isolation Valve Leakage. Included in this is a requirement to shutdown the unit if leakage can not be reduced to within limits within the specified time frame. TS 5.7.2.11 provides the Inservice Testing Program. REVISION 06 UPDATE: Section 3.9.6 of SSER22 includes: "Currently, the development and submittal of an acceptable IST program for the WBN Unit 2 is Open Item 13 (Appendix HH). The NRC will include its evaluation of the IST program in a future supplement to the SER before it issues an OL for WBN Unit 2." SSER22 shows the status for this item as "Open (NRR)."
3.9.7		NA	Area not addressed in 1981 Standard Review Plan.
3.9.8		NA	Area not addressed in 1981 Standard Review Plan.
3.10.0	23	CI 07	In SSER1 the staff discussed their evaluation of the TVA program for qualification of electrical and mechanical equipment for seismic and other loads, and opened the OUTSTANDING ISSUE involving adequacy of frequency test, peak broadening of response spectra, reconciling actual field mounting by welding vs. testing configuration mounted by bolting and need for surveillance and maintenance programs to address aging. The staff provided a status of these issues in SSER3 and closed peak broadening of response spectra, use of damping values, consideration of nozzle loads, and status of seismic qualification. Other specific issues were closed in this supplement as well. In SSER5, the staff stated that this issue remained open. In a letter dated December 1, 1982, TVA provided justification for single-frequency tests to seismically qualify the Reactor Protection System cabinet. This showed that test response spectra (TRS) were

* = See last page for status code definition.

substantially higher than broadened required response spectra (RRS) throughout the required frequency range. The staff evaluated test results and building seismic behavior and considered this aspect of the testing issue closed in SSER6.

Staff concerns on the impact of aging on seismic performance were resolved in SSER6 based on discussions with TVA technical personnel and review of maintenance and surveillance instruction manuals.

There was a specific issue on installing spacers for the 125V DC vital batteries as was done during qualification testing and required by the manufacturer. The issue was closed in SSER6 when it was determined that spacers had been installed.

With regard to the overall issue on adequacy of testing, the staff performed an audit as part of Appendix S of SSER9. This included a review of the TVA approach, criteria and action plan to address effect of directional coupling and verification that acceleration at each device location is less than .95g because relay chatter at higher acceleration levels is expected. TRS enveloped RRS for all directions. The staff found the above to be in accordance with SRP 3.10 and IEEE 344-1975 and closed the issue.

For reconciling the impact for equipment actually mounted using welding but tested with mounting by bolting, in-situ test results were provided to NRC (in letters dated April 30, 1985, and January 30, 1986) along with Westinghouse report on seismic qualification by analysis and testing for the main control board. The staff reviewed these results and on the basis of the consistency of all results provided, concluded that the issue was resolved in SSER6.

Unit 2 Action: Complete Equipment Seismic Qualification CAP using the Unit 1 approach.

In SSER4, the staff reviewed an issue on the vibration of deep draft pumps and found it acceptable.

In SSER8, the staff accepted a proposed revision to FSAR Section 3.7.3.16 to indicate that the alternative seismic qualification method is to follow the requirements of IEEE Standard 344-1971 and address the guidelines of SRP Section 3.10.

REVISION 02 UPDATE:

The status in SSER21 is Open (NRR).

TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Equipment Seismic Qualification CAP .

In SSER21, the Equipment Seismic Qualification CAP was resolved. Completion of the Equipment Seismic Qualification CAP is tracked under 23.2.6.

REVISION 07 UPDATE:

3.10 of SSER23 includes:

"Summary and Conclusions

Based on its review of WBN Unit 2 FSAR Amendment 95 and the information provided by TVA in its letter dated July 31, 2010, the staff concludes that TVA did not make any substantive changes to Section 3.10 of the FSAR, as reviewed and approved by the NRC staff in NUREG-0847 and its Supplements 1-9. Therefore, the staff concludes that Section 3.10 of the WBN Unit 2 FSAR is acceptable."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER23 shows the status for this item as "Resolved."
3.11.0	22	CI 07	OUTSTANDING ISSUE - TVA program not submitted at time of SER The EQ program was submitted after issuance of the SER. It was reviewed and found acceptable in SSER15. Unit 2 Action: Complete EQ Special Program. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the EQ SP. In SSER21, the Environmental Qualification Special Program was resolved. The EQ program is tracked under 23.3.4. --- --- REVISION 06 UPDATE: Section 3.11.3 of SSER22 included, "The staff will update this SSER upon satisfactory closure of the open items identified in Appendix HH, consistent with the staff's approach to the review and acceptance of the WBN Unit 1 EQ program." The following Open Items of Appendix HH are applicable to this item: 16, 17, 18, 19, 20, 21, 22, 23, and 24. SSER22 shows the status for this item as "OPEN (NRR)." --- Per TVA letter to NRC dated April 6, 2011, the action for Open Item 16 is for NRC Inspection / Review. --- Per TVA letter to NRC dated April 6, 2011, the action for Open Item 17 is for NRC Inspection / Review. --- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 18: "Addressed in the response to RAI 3.11 - EQ - 1. in TVA to NRC letter dated December 17, 2010, 'Watts Bar Nuclear Plant (WBN) Unit 2 – Safety Evaluation Report Supplement 22 (SSER22) – Response to Requests for Additional Information' (ADAMS Accession No. ML103540560)." --- TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 19: "WBN Unit 2 Environmental Qualification procedures were provided to the NRC Regional Inspectors for the Environmental Qualification Inspection the week of April 18, 2011 for closure of this action item." --- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 20:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"The refurbishment of the 6.9 kV motors for Unit 2 involved routine maintenance activities. These maintenance activities did not modify or repair the motor insulation system originally supplied by Westinghouse. However, review of the original qualification report indicates that the testing performed meets the requirements for a Category I qualification. Motors which only require routine maintenance will have their binders revised and will be re-classified as Category I. In one case (Containment Spray Pump Motor), the maintenance activities determined the need to rewind the motor. The rewound motor insulation system is qualified in accordance with the EPRI motor rewind program which meets Category I criteria." ---------- TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 21: "The closure package has been provided to the WBN Unit 2 Resident Inspectors." ---------- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 22: "This item was addressed in the response to RAI 3.11 - EQ - 3.b. in TVA to NRC letter dated December 17, 2010, 'Watts Bar Nuclear Plant (WBN) Unit 2 – Safety Evaluation Report Supplement 22 (SSER22) – Response to Requests for Additional Information' (ADAMS Accession No. ML103540560). The response stated, "For EQ applications, the replacement terminal blocks will be new GE CR151B terminal blocks certified to test reports that document qualification to NUREG-0588, Category I criteria. TVA discussed this issue with the NRC during the ACRS meeting on February 24, 2011. The NRC staff accepted TVA's explanation of the term "equivalent" as provided above. Therefore, TVA considers this item to be closed." ---------- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 23: "TVA will qualify the MSIV solenoids to the Category I criteria." ---------- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 24: "Calculation 'A Review of Electronic Components in a Radiation Environment of ≤ 5x104 RADS' is provided as Attachment 2." [Since ACCESS does not use exponents, it is clarified that "≤ 5x104" is equal to "≤ 5x10E4."] ---------- NRC Inspection Report 391/2011-604 closed SSER22 (Appendix HH) Open Items 18 and 19. ---------- ---------- REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed SSER (Appendix H) Open Item Number 20. NRC Inspection Report 391/2011-607 closed SSER (Appendix H) Open Item Number 21.
3.12.0		NA	Addressed in 3.9.1 through 3.9.3.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
3.12.1		NA	Addressed in 3.9.1 through 3.9.3.
3.12.2		NA	Addressed in 3.9.1 through 3.9.3.
3.12.3		NA	Addressed in 3.9.1 through 3.9.3.
3.12.4		NA	Addressed in 3.9.1 through 3.9.3.
3.12.5		NA	Addressed in 3.9.1 through 3.9.3.
3.12.6		NA	Addressed in 3.9.1 through 3.9.3.
3.13.0	22	C 06	Area not addressed in 1981 Standard Review Plan. REVISION 06 UPDATE: Section 3.13 of SER22 was as follows: "3.13 Threaded Fasteners In SSER 21, Section 1.7, the NRC staff identified Section 3.13.0 as an issue but did not list the issue status. NRC Bulletin 82-02, "Degradation of Threaded Fasteners in the Reactor Coolant Pressure Boundary of PWR Plants," dated June 2, 1982, addressed threaded fasteners. In its letter dated March 20, 2008, TVA committed to implementing the actions of NRC Bulletin 82-02 in WBN Unit 2, using the same approach as it used on Unit 1. NRC Inspection Report 50-390/85-08 and 50-391/85-08, dated March 29, 1985, documented receipt and review of TVA's response to Bulletin 82-02, and documented closure of the Bulletin for WBN Unit 1, based upon the NRC's verification of TVA's actions. The NRC staff concludes that TVA's approach to addressing this issue for WBN Unit 2 is acceptable, based upon its commitment to implement Bulletin 82-02 for WBN Unit 2, using the same approach as at Unit 1." SSER22 shows the status for this item as "Resolved."
4.0.0	0	C	Approved for both units in SER.
4.1.0	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
4.2.0	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 4.2 includes: "Based on its review of the information provided by TVA in the proposed WBN Unit 2 FSAR, the NRC staff concludes that no substantive differences exist between the fuel system designs for WBN Unit 1 and WBN, Unit 2. In the staff requirements memorandum (SRM) associated with SECY-07-0096, "Possible Reactivation of Construction and Licensing Activities for the Watts Bar Nuclear Plant Unit 2," dated July 25, 2007 (ADAMS Accession No. ML072060688), the Commission stated that it supports a licensing review approach that employs the current licensing basis for WBN Unit 1 as the reference basis for the review and licensing of WBN, Unit 2. Since no substantive differences exist between the design for WBN Unit 2 and the previously reviewed and approved fuel system design for WBN Unit 1, the staff concludes that the fuel system design for WBN Unit 2 is acceptable."
4.2.1	23	CO 07	In SSER13, NRC determined that internal fuel rod pressure was not key design information that needed to be included in the WBN Unit 1 Technical Specifications. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of the second generation Robust Fuel Assembly design (RFA-2). REVISION 07 UPDATE: 4.2.1 of SSER23 includes: "All aspects of the Westinghouse fuel design are based on mechanical tests, in-reactor operating experience, and engineering analyses. Additionally, the performance of the design inside the reactor is subject to the continuing surveillance programs of Westinghouse and individual utilities. These programs provide confirmatory and current design performance information." SSER23 shows the status for this item as "Resolved."
4.2.2	23	O 07	CONFIRMATORY ISSUE on cladding collapse calculations The staff reviewed the calculation for the predicted cladding collapse for the most limiting Watts Bar fuel and found it acceptable. Staff closed issue in SSER2. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. --- --- REVISION 07 UPDATE: 4.2.2 of SSER23 includes: "Based on its review, as documented in the safety evaluation for WBN Unit 1 License Amendment No. 46, the NRC staff determined that TVA used the appropriate methodology and acceptance criteria for evaluating the fuel rod performance of RFA-2 fuel. Because the acceptance criteria were satisfied, the NRC staff concludes that the RFA-2 fuel design is acceptable for WBN Unit 2." AND "The NRC staff is unclear whether the use of a thermal conductivity model that does not account for burnup degradation remains conservative, given the expected time in life of the maximum stored energy in the fuel. The NRC staff needs additional information from TVA to demonstrate that PAD 4.0 can conservatively calculate the fuel temperature and other impacted variables, such as stored energy, given the lack of a fuel thermal conductivity degradation model. This is Open Item 61 (Appendix HH)." --- SSER23 shows the status for this item as "Open (NRR)." --- Open Item 61 (Appendix HH) reads as follows: "TVA should provide information to the NRC staff to demonstrate that PAD 4.0 can conservatively calculate the fuel temperature and other impacted variables, such as stored energy, given the lack of a fuel thermal conductivity degradation model. (Section 4.2.2)"
4.2.3	23	CO --- 07	CONFIRMATORY ISSUE - identify margins and to offset reduction in DNBR due to fuel rod bowing and incorporating residual bow penalty into the Technical Specifications. In SSER2, the staff concluded TVA had an acceptable means of analyzing the effects of fuel rod bowing and determining any residual rod bowing penalties on the departure from nucleate boiling ratio and total peaking power. Staff closed the issue in SSER2. In SSER10, NRC reviewed design loading conditions for the reactor vessel internals and raised an issue on the seismic analysis of the control rod drive mechanisms (CRDMs). TVA's letter dated June 15, 1993, for both units discussed CRDM seismic operability. In SSER13, the NRC documented that concerns related to CRDM seismic qualification had been resolved. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. ---

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 07 UPDATE: 4.2.3 of SSER23 includes: "Based on its safety evaluation for WBN Unit 1 License Amendment No. 46, the NRC staff concludes that the homogenous core of RFA-2 fuel for WBN Unit 2 is bounded by the WBN Unit 1 mixed core analysis and is, therefore, acceptable." SSER23 shows the status for this item as "Resolved."
4.2.4	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 4.2.4 of SSER23 includes: "Since the proposed WBN Unit 2 TS 3.4.16 SRs are the same as those previously approved for WBN Unit 1 and they are consistent with NUREG-1431, the staff concludes that the proposed WBN Unit 2 TS 3.4.16 SRs are acceptable." SSER23 DOES NOT SHOW A STATUS FOR THIS ITEM.
4.2.5	23	CO 07	"FUEL DESIGN CONCLUSIONS" left open until all items in subsection are closed. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. REVISION 07 UPDATE: 4.2.5 of SSER23 states: "Based on its review of the WBN fuel safety analysis, the satisfactory experience with this fuel type in other operating reactors, and its previous approval of this fuel type in WBN Unit 1, the NRC staff concludes that the RFA-2 fuel for WBN Unit 2 will perform its function adequately and that TVA has met all applicable regulatory requirements." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
4.3.0	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 4.3 includes: "Based on its review of the information provided by TVA in the proposed WBN Unit 2 FSAR and in WBN Unit 2 FSAR Amendment 92, the NRC staff concludes that no substantive differences exist between the nuclear design of WBN Unit 1 and the design for WBN, Unit 2. In its SRM for SECY-07-0096, the Commission stated that it supports a licensing review approach that employs the current licensing basis for WBN Unit 1 as the reference basis for the review and licensing of WBN, Unit 2. Since no substantive differences exist between the design for WBN Unit 2 and the previously reviewed and approved nuclear design for WBN Unit 1, the staff concludes that the nuclear design for WBN Unit 2 is acceptable."
4.3.1	23	CO 07	In SSER13, NRC reviewed the V5H fuel design and found use of V5H fuel acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. REVISION 07 UPDATE: 4.3.1 of SSER23 includes: "In the SER, the NRC staff concluded that the nuclear design bases presented in the FSAR conform to the requirements of GDC 10, 11, 12, 13, 20, 25, 26, 27, and 28 of Appendix A to 10 CFR Part 50 and are, therefore, acceptable. Based on its review, as described below, the NRC staff concludes that the nuclear design bases continue to conform to the aforementioned GDC." SSER23 shows the status for this item as "Resolved."
4.3.2	23	CO 07	In SSER13, NRC reviewed the V5H fuel design and found use of V5H fuel acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. In SSER15, NRC reviewed TVA's proposed changes to the FSAR from a reanalysis of Pressurized Thermal Shock. The analysis was subsequently incorporated into the FSAR. REVISION 02 UPDATE:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. --- --- REVISION 07 UPDATE: 4.3.2 of SSER23 includes: "The NRC staff reviewed the WBN Unit 2 reactor core design parameters and verified that the parameters are consistent with those used in similar reactors, such as the McGuire Nuclear Station (see WBN Unit 2 FSAR Table 4.1-1,"Reactor Design Comparison Table") and WBN Unit 1 (see WBN Unit 1 FSAR Table 4.1-1,"Reactor Design Comparison Table"). Based on its approval of these similar core design parameters and satisfactory industry operating experience with these designs, the staff concludes that the reactor core design parameters proposed in WBN Unit 2 are acceptable." --- SSER23 shows the status for this item as "Resolved."
4.3.3	23	CO --- 07	In SSER13, NRC reviewed the V5H fuel design and found use of V5H fuel acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. --- --- REVISION 07 UPDATE: 4.3.3 of SSER23 includes: "Since the methods have been approved by the NRC and validated by industry operating experience, the NRC staff concludes that these methods are acceptable for use in calculating the nuclear characteristics of the WBN Unit 2 core." --- SSER23 shows the status for this item as "Resolved."
4.3.4	23	CO --- 07	In SSER13, NRC reviewed the V5H fuel design and found use of V5H fuel acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			FSAR Chapter 4 was updated to address the application of RFA-2 fuel. REVISION 07 UPDATE: 4.3.4 of SSER23 includes: "Based on its review of the information provided by TVA in the WBN Unit 2 FSAR dated February 8, 2008, and in WBN Unit 2 Amendment 92, the NRC staff concludes that there are no substantive differences between the nuclear designs of WBN Unit 1 and Unit 2. Since the staff has previously reviewed and approved the nuclear design for WBN Unit 1 and no substantive differences exist between the designs of the two units, as noted in SSER Section 4.3.2 above, the staff concludes that the nuclear design bases, features, and limits for WBN Unit 2 continue to conform to the requirements of GDC 10, 11, 12, 13, 20, 25, 26, 27, and 28. Therefore, the staff concludes that the WBN Unit 2 design is acceptable." SSER23 shows the status for this item as "Resolved."
4.4.0	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 4.4 includes: "Based on its review of the information provided by TVA in the proposed WBN Unit 2 FSAR and in WBN Unit 2 FSAR Amendment 92, the NRC staff concludes that no substantive differences exist between the thermal-hydraulic design for WBN Unit 1 and the thermal-hydraulic design for WBN, Unit 2. In the SRM for SECY-07-0096, the Commission stated that it supports a licensing review approach that employs the current licensing basis for WBN Unit 1 as the reference basis for the review and licensing of WBN, Unit 2. Since the staff has previously reviewed and approved the thermal-hydraulic design for WBN Unit 1 and no substantive differences exist between the designs of the two units, the staff concludes that the thermal-hydraulic design for WBN Unit 2 is acceptable without further review."
4.4.1	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 4.4.1 of SSER23 includes: "These performance and safety criteria are based on the event classification scheme and safety criteria of American National Standards Institute (ANSI) N18.2-1973, "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants," and limited to the criteria that apply to the plant's thermal-hydraulic design. ANSI N 18.2-1973 specifies additional criteria (e.g., those that pertain to pressure boundary integrity); other sections of this report identify these criteria, as applicable. The NRC staff stated these same performance and safety criteria for WBN in Section 4.4.1 of the SER." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
4.4.2	23	CO --- 07	In SSER12, NRC evaluated a change in reactor coolant flow (upflow) for both units. NRC concluded in a July 28, 1993 letter for both units that the proposed upflow modification was acceptable. ---------- Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. ---------- ---------- REVISION 07 UPDATE: 4.4.2 of SSER23 includes: "To satisfy the above criteria, the design bases discussed below apply to the thermal-hydraulic design of the reactor core, as stated by the NRC staff in Section 4.4.2 of the SER and by TVA in Section 4.4.1 of WBN Unit 2 FSAR Amendment 101." ---------- SSER23 shows the status for this item as "Resolved."
4.4.3	23	CO --- 07	OUTSTANDING ISSUE concerning removal of RTD bypass system This outstanding issue was opened in SSER6. Staff issued an SER dated June 13, 1989, for Unit 1 only that approved replacement of the RTD bypass system with an Eagle-21 microprocessor system for monitoring reactor coolant temperature. NRC provided their initial assessment of the RTD bypass removal for WBN Unit 1 in SSER8. This SER was reproduced in SSER8, Appendix R. In SSER16, NRC reviewed the flow measurement uncertainty value for the reactor coolant system. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. ---------- In SSER12, NRC evaluated a change in reactor coolant flow (upflow) for both units. NRC concluded that the proposed upflow modification was acceptable. ---------- In SSER13, NRC reviewed thermal hydraulic methodologies and concluded that the V5H thermal-hydraulic design was acceptable for Watts Bar. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ----------

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REVISION 02 UPDATE:

TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008.

Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009.

FSAR Chapter 4 was updated to address the application of RFA-2 fuel.

REVISION 07 UPDATE:

[all portions are from SSER23]

4.4.3.1 includes:

"TVA has proposed a DNBR value of 1.23 to ensure that there is a 95-percent probability at a 95-percent confidence level that critical heat flux will not occur on the limiting fuel rod. TVA used this same DNBR value for the RFA-2 fuel in WBN, Unit 1. Since TVA has used an NRC-approved methodology, described in WCAP-1 1397-P-A, "Revised Thermal Design Procedure," issued April 1989, the NRC staff concludes that the DNB design methodology used in the design of WBN Unit 2 is acceptable."

4.4.3.2 includes:

"The coolant flow based on thermal design flow for WBN Unit 2 as stated in Table 4.4-1 'Thermal and Hydraulic Comparison Table, of the WBN Unit 2 FSAR is the same as that stated in WBN Unit 1 FSAR Amendment 8, dated April 20, 2010 (ADAMS Accession No. ML101230435). Therefore, the NRC staff concludes that the core flow is acceptable."

4.4.3.3 includes:

"Based on operating experience, flow stability experience, and the thermal-hydraulic design of Westinghouse PWRs, the NRC staff concludes that there is reasonable assurance that hydrodynamic instability will not occur at WBN, Unit 2."

4.4.3.4 reads:

"By letter dated June 13, 1989 (ADAMS Accession No. ML073511999), the NRC staff approved the Eagle-21 microprocessor system used at WBN Unit 1 for measuring RCS temperature. Chapter 7 of WBN Unit 2 FSAR Amendment 101, states that WBN Unit 2 will use the same system; therefore, the NRC staff concludes that the system is acceptable for WBN Unit 2."

SSER23 shows the status for this item as "Resolved."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
4.4.4	23	CO --- 07	In SSER13, NRC reviewed TVA's responses to a request for additional information concerning fuel rod bowing and crud buildup for WBN Unit 1. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. FSAR Chapter 4 was updated to address the application of RFA-2 fuel. --- --- REVISION 07 UPDATE: 4.4.4 of SSER23 includes: "WBN Unit 1 License Amendment No. 46 approved the addition to the WBN Unit 1 TS of three methodologies (WRB-2M DNB correlation, revised thermal design procedure, and VIPRE-01) to determine cycle-specific core operating limits, in support of TVA's use of the Westinghouse 17x17 array RFA-2 fuel design with IFMs at WBN, Unit 1. Based on the information provided by TVA in WBN Unit 2 FSAR Amendment 101 and TVA's use of NRC-approved methodologies in its analysis, the NRC staff concludes that TVA has acceptably addressed fuel rod bowing for the RFA-2 fuel in WBN, Unit 2." SSER23 shows the status for this item as "Resolved."
4.4.5	23	CO --- 07	CONFIRMATORY ISSUE / LICENSE CONDITION on review of Loose Parts Monitoring System (LPMS) startup report and inclusion of limiting conditions for LPMS in Technical Specifications TVA letters dated February 25, 1982, and November 10, 1982, provided a description of operator training and an evaluation of conformance to RG 1.133. In SSER3, the staff closed the confirmatory issue and opened a license condition to track submittal of the startup test results and the alert level setting. In SSER5, the staff closed the LICENSE CONDITION to a TVA commitment to provide the startup test results and the alert level settings made in a letter dated September 19, 1990, for both units. In SSER16, NRC reviewed additional information and revised commitments associated with the LPMS. For Unit 2 due to obsolescence, TVA will replace the LPMS. Unit 2 Action: Provide the startup test results and the alert level settings. --- --- REVISION 07 UPDATE: 4.4.5 of SSER23 includes: "Based on its review of the information provided by TVA, the NRC staff concludes that the proposed LPMS at WBN Unit 2 conforms to the guidance in Regulatory Position C. 1 of RG 1.133, with nonsubstantive differences noted in FSAR Table 7.1-1 (e.g., WBN TS requirements for specific sensor locations were relocated to the licensee-controlled technical requirements manual). Therefore, the NRC staff concludes that the proposed LPMS at WBN Unit 2 is acceptable." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
4.4.6	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 4.4.6 of SSER23 includes: "The NRC staff concludes that the WBN Unit 2 thermal-hydraulic design is acceptable because its parameters are consistent with the NRC-approved thermal-hydraulic design parameters of WBN Unit 1 and McGuire, Units 1 and 2, which have a satisfactory operating history." SSER23 shows the status for this item as "Resolved."
4.4.7	23	C 07	"Technical Resolution of Generic Issue B-59-(N-1) Loop Operation in BWRs and PWRs – N-1 Loop operation was addressed in original 1982 SER (4.4.7). Unit 2 Action: Confirm Technical Specifications prohibit (N-1) Loop Operation. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS LCO 3.4.4 requires that four Reactor Coolant System loops be operable and in operation during Modes 1 and 2. REVISION 07 UPDATE: 4.4.7 of SSER23 includes: "In its letter dated February 2, 2010, TVA provided developmental revision B of the WBN Unit 2 TS. Proposed Limiting Condition for Operation 3.4.4 requires that "Four RCS loops shall be OPERABLE and in operation." This is the same TS requirement for WBN Unit 1 and so the NRC concludes that it is acceptable." SSER23 shows the status for this item as "Resolved."
4.4.8	23	O 07	LICENSE CONDITION - Detectors for Inadequate core cooling (II.F.2) GL 82-28 / NUREG-0737, II.F.2, "Inadequate Core Cooling Instrumentation System" – In the original SER, the review of the ICC instrumentation was incomplete. The January 24, 1992, letter superseded the previous responses on this issue. TVA letter for Units 1 and 2 dated January 24, 1992, committed to install Westinghouse ICCM-86 and associated hardware. NRC completed the review for Units 1 and 2 in SSER10. For Unit 2 due to obsolescence of the ICCM-86 system, TVA intends to install the Westinghouse Common Q Post-Accident Monitoring System. Unit 2 Action: Install Westinghouse Common Q PAM system. REVISION 07 UPDATE:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			4.4.8 of SSER23 includes: "Based on its review, the staff asked TVA several questions regarding the ICC instrumentation. TVA responded to these questions by letter dated October 26, 2010 (ADAMS Accession No. ML103020322). Enclosure 1 to this letter provided a Westinghouse document entitled, "Tennessee Valley Authority (TVA), Watts Bar Unit 2 (WBN2), Post-Accident Monitoring System (PAMS), Licensing Technical Report, Revision 1, WNA-LI-00058-WBT-P," issued October 2010 (ADAMS Accession No. ML103020324; not publicly available). The NRC staff should complete its review and evaluation of the additional information provided by TVA regarding the ICC instrumentation. This is Open Item 72 (Appendix HH)." SSER23 shows the status for this item as "Open (NRR)." ---------- Open Item 72 (Appendix HH) reads as follows: "The NRC staff should complete its review and evaluation of the additional information provided by TVA regarding the ICC instrumentation. (Section 4.4.8)" ---------- NRC Inspection Report 391/2011-608 closed GL 82-028 and NUREG-0737, II.F.2.
4.4.9	23	O 07	"CONCLUSION" left open until all items in subsection are closed. REVISION 07 UPDATE: 4.4.9 of SSER23 includes: "Based on its review of the analyses of the core thermal-hydraulic performance provided by TVA, the NRC staff concludes that the core has been designed with appropriate margin to ensure that acceptable fuel design limits are not exceeded during steady-state operation and anticipated operational occurrences. The thermal-hydraulic design of the core, therefore, meets the requirements of GDC 10 and is acceptable for preliminary design approval, pending completion of Open Item 72 (Appendix HH). In Section 4.4.9 of the SER, the staff documented that TVA has committed to a preoperational and initial startup test program in accordance with RG 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants," to measure and confirm the thermal-hydraulic design aspects." SSER23 shows the status for this item as "Open (NRR)." ---------- Open Item 72 (Appendix HH) reads as follows: "The NRC staff should complete its review and evaluation of the additional information provided by TVA regarding the ICC instrumentation. (Section 4.4.8)"
4.5.0	0	C	Approved for both units in SER.
4.5.1	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
4.5.2	0	C	Approved for both units in SER.
4.6.0	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 4.6 of SSER23 includes: "Section 4.2.3, "Reactivity Control System," of the WBN Unit 2 FSAR describes the functional design of the WBN Unit 2 reactivity control systems. The NRC staff compared Section 4.2.3 of the WBN Unit 2 FSAR with Section 4.2.3 of the WBN Unit 1 FSAR and concluded that no substantive differences exist. Therefore, the staff concludes that Section 4.2.3 of the WBN Unit 2 FSAR is acceptable. FSAR Section 4.3, "Nuclear Design," describes the functional requirements of the reactivity control system. Section 4.3 of this SSER provides the staff's evaluation of the functional requirements of the reactivity control system." SSER23 shows the status for this item as "Resolved."
5.0.0	0	C	Approved for both units in SER.
5.1.0	6	S 02	The staff stated that the Eagle 21 microprocessor system was an acceptable replacement of the resistance temperature detector (RTD) bypass system for monitoring reactor cooling temperature in SSER5. In SSER6, the staff noted that TVA had incorporated the information for this new design into the FSAR and said they would track results of the review of this design change as an outstanding issue - Removal of RTD Bypass System (See 4.4.3). Unit 2 Action: Provide additional information for NRC review per 7.2.1. REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008.
5.2.0	0	C	Approved for both units in SER.
5.2.1	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 5.2.1.4 of SSER22 includes: "During its review of TVA's WBN Unit 2 Final Safety Analysis Report (FSAR) Amendment 97, dated January 11, 2010, the NRC staff questioned TVA's use of American Society of Mechanical Engineers

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			(ASME) Code Case 1423-2, "Wrought Type 304 and 316 with Nitrogen Added, Sections I, III, VIII, Division 1 and 2," without committing to the limitations and modifications listed in Regulatory Guide (RG) 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III," for this Code case. By letter dated November 9, 2010, TVA responded to the staff, stating the following: Amendment 97 to the Unit 2 FSAR inadvertently incorporated Code Case 1423-2 into Table 5.2-8. ... A future amendment to Unit 2 FSAR Table 5.2-8 will remove the reference to Code Case 1423-2 for the branch nozzles material specifications. A change to Section 5.2.1.4 will not be necessary because the future amendment will reconcile Table 5.2-8 and Section 5.2.1.4. TVA's response is acceptable to the staff." SSER22 shows the status for this item as "Resolved."
5.2.2	23	C --- 07	OUTSTANDING ISSUE on staff review of sensitivity study of required safety valve flow rate versus trip parameter TVA letter dated April 18, 1983, provided the safety valve sizing information and information on differences with the reference plant. Staff closed issue in SSER2. --- In SSER15, the staff stated that subject to resolution of NUREG-737 Items II.D.1 (performance testing of relief and safety valves) and II.D.3 (indication of relief and safety valve position), overpressure protection at hot operating conditions will comply with the guidelines of SRP 5.2.2 and requirements of GDC 15. They noted that these items were found to be acceptable. --- --- REVISION 07 UPDATE: 5.2.2 of SSER24 includes: "Conclusion The NRC staff reviewed TVA's analyses related to the overpressure protection capability of the WBN Unit 2 during power operation. The NRC staff concludes that TVA has (1) adequately accounted for the pressurization events and the plant overpressure protection features and (2) demonstrated that the plant will have sufficient pressure relief capacity to ensure that pressure limits are not exceeded. Based on this, the NRC staff concludes that the overpressure protection features will provide adequate protection to meet the requirements of GDC 15 and 31. Therefore, the NRC staff finds the overpressure protection features acceptable with respect to overpressure protection during power operation." SSER24 shows the status for this item as "Resolved."
5.2.3	22	C --- 06	Approved for both units in SER. --- --- REVISION 06 UPDATE: Section 5.2.3 of SSER22 included the following: "SRP Section 5.2.3 contains the relevant NRC regulatory requirements for this area of review and the associated acceptance criteria." "Since the provisions of ASME Code Case 1423-2 have been incorporated into the current ASME Code, and TVA has met the conditions previously required by the staff for use of this Code case for all austenitic

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			stainless steels, the NRC staff finds the use of this ASME Code case acceptable. The NRC staff finds that the changes made by TVA to the materials specifications meet the requirements of either a version of the ASME Code incorporated by reference in 10 CFR 50.55a or ASME Code cases that have been accepted by the staff and therefore conform to the requirements of 10 CFR 50.55a. Thus, the staff finds the materials specifications acceptable." "Based on TVA's consideration of operating experience related to zinc and the consideration of zinc addition in cycle-specific crud risk analyses, the NRC staff concludes that TVA has taken adequate measures to prevent adverse effects on fuel from zinc addition; therefore, TVA's actions are acceptable." "Based on the staff's review of the information provided by TVA in FSAR Amendment 97, as supplemented by letter dated July 31, 2010, regarding zinc addition to the primary system, the staff concludes that the changes to the reactor coolant chemistry are compatible with the RCPB materials and that the integrity of the RCPB will not be adversely affected. Therefore, the requirements of GDC 14 continue to be met, and TVA's proposed changes are acceptable. The staff also concludes the changes to the materials specifications proposed by TVA in WBN Unit 2 FSAR Amendment 98 meet 10 CFR 50.55a, since the specifications are either ASME approved or the materials meet NRC staff-approved code cases." SSER22 shows the status for this item as "Resolved."
5.2.4	23	O --- 07	LICENSE CONDITION – Inservice inspection (ISI) program The ISI program is required to be submitted within 6 months of the date of issuance of the operating license. The applicable ASME Code edition and addenda are determined by reference to 50.55a(b) 12 months preceding the date of issuance of the OL. The staff reiterated this in SSER10. In SSER12, the LICENSE CONDITION was resolved by a TVA commitment to submit the program within six months after receiving the operating license. Unit 2 Action: Submit Unit 2 ISI program. ---------- OUTSTANDING ISSUE - Unit 2 PSI program submitted April 30, 1990, with a partial listing of relief requests. This item tracked the staff review. In the SER, the preservice inspection program was still under review. NRC reviewed the Unit 1 PSI program in SSERs 10, 12, and 16. Unit 2 Action: Submit Unit 2 PSI program. ---------- ---------- REVISION 03 UPDATE: Preservice Inspection Plan, Program No. WBN-2 PSI, Revision 3 was submitted to the NRC on June 17, 2010 (ADAMS Accession No. ML101680561). ---------- ---------- REVISION 05 UPDATE: Corrected status from "O" to "S." ---------- ----------

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 07 UPDATE: 5.2.4 of SSER23 includes: "By letter dated June 17, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML101680561), the Tennessee Valley Authority (TVA, the applicant) submitted Revision 3 to its Preservice Inspection Program Plan to the U.S. Nuclear Regulatory Commission (NRC) staff for review in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.55a, "Codes and Standards," for the Watts Bar Nuclear Plant (WBN), Unit 2. Appendix Z to this SSER includes the NRC staff's evaluation of the WBN Unit 2 Preservice Inspection Program Plan." 4.0 (Conclusions) of Appendix Z reads as follows: "The NRC staff reviewed TVA's submittal and concluded that IVA has addressed all of the regulatory requirements set forth in 10 CFR 50.55a and, based the staff's review of the documents listed in Section 6 of this report, no deviations from applicable regulatory requirements or TVA's commitments were identified in the PSI Program Plan, Revision 3, for WBN Unit 2. Open Item 70 (Appendix HH of SSER 23), as noted in Section 3.2.3 of this report, remains open pending NRC staff verification of the populations and the number of required examinations in accordance with the reference code." SSER23 shows the status for this item as "Open (NRR)." ---------- Open Item 70 (Appendix HH) reads as follows: "TVA should provide the revised WBN Unit 2 PSI program ASME Class 1, 2, and 3 Supports "Summary Tables," to include numbers of components so that the NRC staff can verify that the numbers meet the reference ASME Code. (Section 3.2.3 of Appendix Z of SSER 23)"
5.2.5	22	C --- 06	In SSER9, the staff stated that since the UHI system has been eliminated from the WB design , the previous discussion of this system in the SER no longer applies, but the conclusions reached in the SER were still valid. In SSER11, the staff reviewed valve stem leakage and stated that the staff's prior conclusions about valve stem leakage were not affected. In SSER12, the staff retracted the requirement identified in the SER that if leakage is alarmed and confirmed in a flow path with no indicators, then the Technical Specifications require a water inventory material balance be initiated within one hour. The staff also provided a clarification of SER wording related to detection of intersystem leakage through check valves and stated that this did not change prior staff conclusions and the reactor coolant pressure boundary system remains acceptable. ---------- ---------- REVISION 02 UPDATE: In SSER21 the status is Open (NRR). ---------- ---------- REVISION06 UPDATE: Section 5.2.5 of SSER22 included the following: "Based on the above and the previous staff evaluations, as documented in the SER and its supplements, the NRC staff concludes that the RCPB leakage detection systems are diverse and provide reasonable assurance that identified and unidentified primary system leakage will be detected in a timely manner. The systems meet the requirements of GDC 30 with respect to RCPB leakage detection and

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			identification, as well as the guidelines of RG 1.45, "Guidance on Monitoring and Responding to Reactor Coolant System Leakage," Revision 1, issued May 2008, with respect to the RCPB leakage detection system design. Therefore, the staff finds these systems acceptable." SSER22 shows the status for this item as "Resolved."
5.2.6	16	C --- 01	In SSER16, the staff reviewed the analysis of the RPV and internal components and found the use of the WECAN computer code acceptable.
5.3.0	0	C ---	Approved for both units in SER.
5.3.1	25	C --- 08	The staff reviewed TVA's submittal on reactor vessel irradiation in SSER11 and stated that the WB reactor vessels acceptably satisfy the requirements of 10 CFR 50.61. In SSER14, the staff determined that TVA complied with all the requirements in the current Appendix G, 10 CFR Part 50 without exemptions and the previously approved exemptions were no longer needed. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- --- REVISION 06 UPDATE: The Conclusions portion of Section 5.3.1 in SSER22 states: "Pending resolution of Open Item 44 (Appendix HH), the NRC staff concludes that the changes to the FSAR pertaining to the RV materials surveillance program are acceptable because the surveillance program meets the provisions of ASTM E185-82 and, therefore, meets the requirements of 10 CFR Part 50, Appendix H. The staff concludes that the USE and RTPTS values projected at EOL for WBN Unit 2 are acceptable because the values meet the criteria of Appendix G to 10 CFR Part 50 and 10 CFR 50.61, respectively. The staff concludes that the changes to the special processes meet the requirements of GDC 1 and 30 and 10 CFR 50.55a because the welding and NDE of the core support block attachment welds meet the requirements of ASME Code, Section III." SSER22 shows the status for this item as "Open (NRR)." --- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 44: "This response clarifies how the initial and irradiated RTNDT values were determined for the Watts Bar Unit 2 reactor pressure vessel beltline materials. Unit 2 FSAR Section 5.2.4.1 established that the vessel was designed to 1971 Addenda of the ASME Code, an edition that predates the requirements to determine the unirradiated RTNDT. (Those requirements were established in the Summer 1972 Addenda to the Code, Section III, Subarticle NB-2300, whereas the Watts Bar Unit 2 vessel was designed to an earlier version of the Code.) Because the tests performed to assess the adequacy of the fracture toughness predated the Summer 1972 Addenda to the Code, it was necessary to use the methods described in NRC Branch Technical Position (BTP) Materials Engineering Branch (MTEB) 5-2, 'Fracture

* = See last page for status code definition.

Toughness Requirements for Older Plants.' For the Watts Bar Unit 2 vessel, the vessel shell materials were tested by the vessel fabricator using both drop-weight and Charpy impact test specimens. The drop-weight specimens were tested to determine the unirradiated nil-ductility transition temperature (NDTT) in accordance with ASTM E 208. In the ASME Code, Section III, Subarticle NB-2300, the NDTT is used with axial (weak) orientation Charpy test data to determine the initial (unirradiated) RTNDT. For Watts Bar Unit 2, the orientation of the Charpy impact test specimens was in the tangential (strong) orientation rather than in the axial (weak) orientation currently required in NB-2300 to determine the initial RTNDT. BTP MTEB 5-2 provides methods to determine the initial RTNDT using the drop-weight and Charpy impact test results generated for the Watts Bar Unit 2 vessel shell forgings and welds. In summary, both drop-weight and Charpy impact specimens in the tangential (strong) orientation were tested and the results were evaluated to determine the initial RTNDT following the methods in NRC BTP MTEB 5-2.

In addition to those tests performed by the vessel fabricator, unirradiated tests were performed on the Watts Bar Unit 2 reactor vessel surveillance program materials. Tests consisted of Charpy impact specimens from the intermediate shell forging and the core region metal that were oriented in both the tangential (strong) and axial (weak) orientations. When the surveillance program Charpy impact specimens are used with the drop-weight NDTT values obtained by the vessel fabricator, the initial RTNDT values obtained using NRC BTP MTEB 5-2 are found to be conservative.

The irradiated RTNDT, termed the Adjusted Reference Temperature (ART), is used to establish the pressure-Temperature (P-T) limit curves for the vessel as documented in the Pressure and Temperature Limits Report (PTLR). The PTLR for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.2.4.3. The initial P-T limit curves are based on predictions of the effects of irradiation using the methods in NRC Regulatory Guide 1.99, Revision 2, 'Radiation Embrittlement of Reactor Vessel Materials.' As post-irradiation test results become available from the evaluation of test specimens from the Watts Bar Unit 2 reactor vessel surveillance program, ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels", uses those test results to assess the accuracy and conservatism of the predictions based on the methods of NRC Regulatory Guide 1.99, Revision 2. The reactor vessel irradiation surveillance program for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.4.3.6. The effect of irradiation is measured using the Charpy impact specimens. Note that there are no drop-weight test specimens irradiated as part of the Watts Bar Unit 2 surveillance program. The drop-weight specimens are used only for tests on the unirradiated material to determine the drop-weight NDTT.

In summary, both drop-weight and Charpy impact specimens (strong orientation) were tested and the results were evaluated to determine the initial (unirradiated) RTNDT following the methods in NRC BTP MTEB 5-2. Additional tests performed as part of the reactor vessel surveillance program using Charpy impact specimens (weak orientation for the intermediate shell forging), and those data obtained following the ASME Code, Section III, Subarticle NB-2300 demonstrated the initial RTNDT following the methods in NRC BTP MTEB 5-2 to be conservative. The irradiated RTNDT, termed the ART, will be determined using the methods in NRC Regulatory Guide 1.99. As post-irradiation test results become available from the reactor vessel surveillance program materials (the intermediate shell forging and the core region weld metal), those data will be used to assess the accuracy and conservatism of the predictions."

REVISION 08 UPDATE:

5.3.1 of SSER25 reads:

"5.3.1 Reactor Vessel Materials

Open Item 14

In Enclosure 1 of the Tennessee Valley Authority's (TVA's) letter dated July 31, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102290258), TVA responded to the U.S. Nuclear Regulatory Commission (NRC) staff's Request for Additional Information (RAI) 5.3.1-1, Question 1, and proposed changes to the pressure-temperature limits report (PTLR), including the addition of the reactor vessel (RV) surveillance capsule withdrawal schedule and a description of the RV surveillance program. In addition, TVA stated that the Watts Bar Nuclear Plant (WBN) Unit 2 PTLR is included in the WBN Unit 2 "System Description for the Reactor Coolant System" (WBN2-68-4001), which

would be revised to reflect required revisions to the PTLR by September 17, 2010 (Supplemental Safety Evaluation Report (SSER) 22, Section 5.3.1, p 5-8). The staff identified Open Item 14 to verify that TVA had revised the PTLR to include the RV surveillance capsule withdrawal schedule and RV surveillance program description.

In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), TVA stated that Revision 1 (effective August 12, 2010) of WBN2-68-4001 reflected the required revisions to the PTLR.

The staff concludes that TVA's response to Open Item 14 is acceptable because it confirms that TVA has revised the PTLR to include the RV surveillance program information. Therefore, Open Item 14 is closed.

Open Item 44

In response to RAI 5.3.1-1, Question 2, contained in Enclosure 1 to TVA's letter dated July 31, 2010 (ADAMS Accession No. ML102290258), TVA stated that the material test requirements and the acceptance standard use the nil-ductility reference temperature, RTNDT, which is determined in accordance with American Society for Testing and Materials (ASTM) E208, "Standard Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels." Since ASTM E208 is the standard for drop-weight testing, while NRC requirements for determination of RTNDT require a combination of drop-weight and Charpy V-notch (Cv) tests, the NRC staff required, in Open Item 44, that TVA provide additional information to clarify how it determined the initial and irradiated RTNDT (SSER 22, Section 5.3.1, pp 5-9, 5-11, 5-13, 5-17, 5-28, 5-29, 5-31, 5-32).

In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), in response to Open Item 44, TVA explained that the WBN Unit 2 RV fabricator used a combination of drop-weight and Cv tests to determine the initial (unirradiated) RTNDT for the RV materials. The Cv specimens were oriented in the tangential (strong) direction rather that the axial (weak) direction, as is required by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code), Section III, Subarticle NB-2300, which is referenced in Appendix G, "Fracture Toughness Requirements," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," with respect to the method for determining the unirradiated RTNDT. TVA explained that it designed the WBN Unit 2 RV in accordance with the ASME Code, Section II, 1971, addenda, which predate the current requirements for determining the unirradiated RTNDT. However, it used the guidance in NRC Branch Technical Position (BTP) MTEB 5-2 to adjust the Cv results to determine the equivalent properties in the weak direction, which it then used to determine the initial RTNDT. In addition, it performed unirradiated Cv tests on WBN Unit 2 RV surveillance program materials in both the weak and strong directions, and in conjunction with the drop-weight tests, to determine the unirradiated RTNDT. These Cv results showed that the initial RTNDT determination based on the Cv tests in the strong direction, adjusted using BTP MTEB 5-2, are conservative.

TVA also stated that it determined the effects of irradiation on the WBN Unit 2 RV materials using Cv specimens in the surveillance capsules, and that it only used drop-weight testing to determine the unirradiated RTNDT.

The staff concludes that TVA's response to Open Item 44 is acceptable because it clarifies how it determined the initial (unirradiated) and irradiated RTNDT, and because the methods TVA used are consistent with the guidance of BTP MTEB 5-2, which the staff finds acceptable for determining the fracture toughness properties of RVs fabricated before the current ASME Code, Section III, requirements for determining RTNDT came into effect. Therefore, Open Item 44 is closed. "

SSER25 shows the status for this item as "Resolved."

5.3.2	25	C --- 08	OUTSTANDING ISSUE - P-T limits for Unit 2 not provided. Staff will review as part of Unit 2 Technical Specifications.

In the original 1982 SER, NRC indicated that the review of the Unit 2 P-T limits would be completed as part of the review of the Unit 2 Technical Specifications. In SSER16, the staff found the pressure temperature limits methodology and the pressure temperature limits report for Unit 1 acceptable.

Unit 2 action: Submit P-T limits.

* = See last page for status code definition.

REVISION 02 UPDATE:

Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010.

WCAP-17035-NP "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation" was submitted with the TS.

REVISION 06 UPDATE:

The Conclusions portion of Section 5.3.2 in SSER22 states:

"The NRC staff concludes, pending resolution of Open Items 44, 45, and 46, that the P-T limits imposed on the RCS for operating and testing conditions to ensure adequate safety margins against nonductile or rapidly propagating failure conform to the fracture toughness criteria of Appendix G to 10 CFR Part 50. The use of operating limits, as determined by the criteria defined in Section 5.3.2 of the SRP, provides reasonable assurance that nonductile or rapidly propagating failure will not occur. This is an acceptable basis for satisfying the requirements of 10 CFR 50.55a; Appendix G to 10 CFR Part 50; and GDC 1, 14, 31, and 32. Therefore, WBN Unit 2 FSAR Section 5.3 is acceptable."

SSER22 shows the status for this item as "Open (NRR)."

TVA to NRC letter dated April 6, 2011 provided the following responses to Open Items 44, 45, and 46:

Open Item 44:

"This response clarifies how the initial and irradiated RTNDT values were determined for the Watts Bar Unit 2 reactor pressure vessel beltline materials. Unit 2 FSAR Section 5.2.4.1 established that the vessel was designed to 1971 Addenda of the ASME Code, an edition that predates the requirements to determine the unirradiated RTNDT. (Those requirements were established in the Summer 1972 Addenda to the Code, Section III, Subarticle NB-2300, whereas the Watts Bar Unit 2 vessel was designed to an earlier version of the Code.) Because the tests performed to assess the adequacy of the fracture toughness predated the Summer 1972 Addenda to the Code, it was necessary to use the methods described in NRC Branch Technical Position (BTP) Materials Engineering Branch (MTEB) 5-2, "Fracture Toughness Requirements for Older Plants." For the Watts Bar Unit 2 vessel, the vessel shell materials were tested by the vessel fabricator using both drop-weight and Charpy impact test specimens. The drop-weight specimens were tested to determine the unirradiated nil-ductility transition temperature (NDTT) in accordance with ASTM E 208. In the ASME Code, Section III, Subarticle NB-2300, the NDTT is used with axial (weak) orientation Charpy test data to determine the initial (unirradiated) RTNDT. For Watts Bar Unit 2, the orientation of the Charpy impact test specimens was in the tangential (strong) orientation rather than in the axial (weak) orientation currently required in NB-2300 to determine the initial RTNDT. BTP MTEB 5-2 provides methods to determine the initial RTNDT using the drop-weight and Charpy impact test results generated for the Watts Bar Unit 2 vessel shell forgings and welds. In summary, both drop-weight and Charpy impact specimens in the tangential (strong) orientation were tested and the results were evaluated to determine the initial RTNDT following the methods in NRC BTP MTEB 5-2.

In addition to those tests performed by the vessel fabricator, unirradiated tests were performed on the Watts Bar Unit 2 reactor vessel surveillance program materials. Tests consisted of Charpy impact specimens from the intermediate shell forging and the core region metal that were oriented in both the tangential (strong) and axial (weak) orientations. When the surveillance program Charpy impact specimens are used with the drop-weight NDTT values obtained by the vessel fabricator, the initial RTNDT values obtained using NRC BTP MTEB 5-2 are found to be conservative.

The irradiated RTNDT, termed the Adjusted Reference Temperature (ART), is used to establish the pressure-Temperature (P-T) limit curves for the vessel as documented in the Pressure and Temperature

Limits Report (PTLR). The PTLR for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.2.4.3. The initial P-T limit curves are based on predictions of the effects of irradiation using the methods in NRC Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials." As post-irradiation test results become available from the evaluation of test specimens from the Watts Bar Unit 2 reactor vessel surveillance program, ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels", uses those test results to assess the accuracy and conservatism of the predictions based on the methods of NRC Regulatory Guide 1.99, Revision 2. The reactor vessel irradiation surveillance program for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.4.3.6. The effect of irradiation is measured using the Charpy impact specimens. Note that there are no drop-weight test specimens irradiated as part of the Watts Bar Unit 2 surveillance program. The drop-weight specimens are used only for tests on the unirradiated material to determine the drop-weight NDTT.

In summary, both drop-weight and Charpy impact specimens (strong orientation) were tested and the results were evaluated to determine the initial (unirradiated) RTNDT following the methods in NRC BTP MTEB 5-2. Additional tests performed as part of the reactor vessel surveillance program using Charpy impact specimens (weak orientation for the intermediate shell forging), and those data obtained following the ASME Code, Section III, Subarticle NB-2300 demonstrated the initial RTNDT following the methods in NRC BTP MTEB 5-2 to be conservative. The irradiated RTNDT, termed the ART, will be determined using the methods in NRC Regulatory Guide 1.99. As post-irradiation test results become available from the reactor vessel surveillance program materials (the intermediate shell forging and the core region weld metal), those data will be used to assess the accuracy and conservatism of the predictions."

Open Item 45:

"Revision 1 (effective August 12, 2010) to the Unit 2 System Description for the Reactor Coolant System (WBN2-68-4001) was revised to reflect the required revisions to the PTLR. Appendix B, Section 3.2 (Arming Temperature) states, "COMS shall be armed when any RCS cold leg temperature is <225°F."

Open Item 46:

"Revision 1 (effective August 12, 2010) to the Unit 2 System Description for the Reactor Coolant System (WBN2-68-4001) was revised to reflect the required revisions to the PTLR. Appendix B, TABLE 3.1-1 (Watts Bar Unit 2 PORV Setpoints vs Temperature) contains the lift settings."

REVISION 08 UPDATE:

5.3.2 of SSER25 reads:

"5.3.2 Pressure-Temperature Limits

"Open Item 45

TVA stated, in its response to RAI 5.3.2-2, dated July 31, 2010, that it would revise the PTLR to incorporate the cold overpressure mitigation system (COMS) arming temperature (SSER 22, Section 5.3.2, pp 5-28–29, 5-32). The staff identified Open Item 45 to verify incorporation of the COMS arming temperature into the PTLR.

In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), in response to Open Item 45, TVA stated that Revision 1 (effective August 12, 2010) to WBN2-68-4001 reflected the required revision to the PTLR. Appendix B, Section 3.2, "Arming Temperature," states, "COMS shall be armed when any RCS [reactor coolant system] cold leg temperature is less than / equal to 225 °F."

The staff concludes that TVA's response to Open Item 45 is acceptable because it confirms that TVA revised the PTLR to specify the COMS arming temperature. Therefore, Open Item 45 is closed.

Open Item 46

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION

			TVA did not include the low-temperature overpressure protection (LTOP) lift settings in the PTLR but provided them in its response to RAI 5.3.2-2 in its letter dated July 31, 2010. In its RAI response, TVA stated that it would revise the PTLR to incorporate the LTOP lift settings (SSER 22, Section 5.3.2, pp 5-28–29, 5-32). The staff identified Open Item 46 to verify incorporation of the LTOP settings into the PTLR. In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), in response to Open Item 46, TVA stated that Revision 1 (effective August 12, 2010) to WBN2-68-4001 reflected the required revisions to the PTLR. Appendix B, Table 3.1-1, "Watts Bar Unit 2 PORV [Power-Operated Relief Valve] Setpoints vs. Temperature," contains the LTOP lift settings. The staff concludes that TVA's response to Open Item 46 is acceptable because it confirms that TVA revised the PTLR to include the LTOP lift settings into the PTLR. Therefore, Open Item 46 is closed." SSER25 shows the status for this item as "Resolved."
5.3.3	22	S --- 06	OUTSTANDING ISSUE for staff to complete evaluation of Unit 2 after receipt of P-T limits In the original 1982 SER, NRC indicated that the review of the Unit 2 P-T limits would be completed as part of the review of the Unit 2 Technical Specifications. Unit 2 action: Submit P-T limits. ---------- ---------- REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. WCAP-17035-NP "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation" was submitted with the TS. ---------- ---------- REVISION 06 UPDATE: Section 5.3.3 in SSER22 includes: "In summary, the NRC staff concludes that there are no special considerations that make it necessary to consider potential RV failure for WBN Unit 2 because the design, materials, fabrication, inspection, and quality assurance requirements for the plant will continue to conform to applicable NRC regulations and RG, as well as to the provisions of ASME Code, Section III. The stringent fracture toughness requirements of the regulations and ASME Code, Section III, will be met, including requirements for surveillance of vessel material properties throughout service life, in accordance with Appendix H to 10 CFR Part 50. TVA will also establish operating limitations on temperature and pressure for WBN Unit 2 in accordance with ASME Code, Section III, Appendix G, "Protection Against Nonductile Failure," and 10 CFR Part 50, Appendix G. Subject to resolution of Open Items 44, 45, and 46 (Appendix HH), the NRC staff concludes that integrity of the WBN Unit 2 RV is assured for the following reasons ..." SSER22 shows the status for this item as "Open (NRR)." ---------- TVA to NRC letter dated April 6, 2011 provided the following responses to Open Items 44, 45, and 46:

* = See last page for status code definition.

Open Item 44:

"This response clarifies how the initial and irradiated RTNDT values were determined for the Watts Bar Unit 2 reactor pressure vessel beltline materials. Unit 2 FSAR Section 5.2.4.1 established that the vessel was designed to 1971 Addenda of the ASME Code, an edition that predates the requirements to determine the unirradiated RTNDT. (Those requirements were established in the Summer 1972 Addenda to the Code, Section III, Subarticle NB-2300, whereas the Watts Bar Unit 2 vessel was designed to an earlier version of the Code.) Because the tests performed to assess the adequacy of the fracture toughness predated the Summer 1972 Addenda to the Code, it was necessary to use the methods described in NRC Branch Technical Position (BTP) Materials Engineering Branch (MTEB) 5-2, "Fracture Toughness Requirements for Older Plants." For the Watts Bar Unit 2 vessel, the vessel shell materials were tested by the vessel fabricator using both drop-weight and Charpy impact test specimens. The drop-weight specimens were tested to determine the unirradiated nil-ductility transition temperature (NDTT) in accordance with ASTM E 208. In the ASME Code, Section III, Subarticle NB-2300, the NDTT is used with axial (weak) orientation Charpy test data to determine the initial (unirradiated) RTNDT. For Watts Bar Unit 2, the orientation of the Charpy impact test specimens was in the tangential (strong) orientation rather than in the axial (weak) orientation currently required in NB-2300 to determine the initial RTNDT. BTP MTEB 5-2 provides methods to determine the initial RTNDT using the drop-weight and Charpy impact test results generated for the Watts Bar Unit 2 vessel shell forgings and welds. In summary, both drop-weight and Charpy impact specimens in the tangential (strong) orientation were tested and the results were evaluated to determine the initial RTNDT following the methods in NRC BTP MTEB 5-2.

In addition to those tests performed by the vessel fabricator, unirradiated tests were performed on the Watts Bar Unit 2 reactor vessel surveillance program materials. Tests consisted of Charpy impact specimens from the intermediate shell forging and the core region metal that were oriented in both the tangential (strong) and axial (weak) orientations. When the surveillance program Charpy impact specimens are used with the drop-weight NDTT values obtained by the vessel fabricator, the initial RTNDT values obtained using NRC BTP MTEB 5-2 are found to be conservative.

The irradiated RTNDT, termed the Adjusted Reference Temperature (ART), is used to establish the pressure-Temperature (P-T) limit curves for the vessel as documented in the Pressure and Temperature Limits Report (PTLR). The PTLR for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.2.4.3. The initial P-T limit curves are based on predictions of the effects of irradiation using the methods in NRC Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials." As post-irradiation test results become available from the evaluation of test specimens from the Watts Bar Unit 2 reactor vessel surveillance program, ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels", uses those test results to assess the accuracy and conservatism of the predictions based on the methods of NRC Regulatory Guide 1.99, Revision 2. The reactor vessel irradiation surveillance program for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.4.3.6. The effect of irradiation is measured using the Charpy impact specimens. Note that there are no drop-weight test specimens irradiated as part of the Watts Bar Unit 2 surveillance program. The drop-weight specimens are used only for tests on the unirradiated material to determine the drop-weight NDTT.

In summary, both drop-weight and Charpy impact specimens (strong orientation) were tested and the results were evaluated to determine the initial (unirradiated) RTNDT following the methods in NRC BTP MTEB 5-2. Additional tests performed as part of the reactor vessel surveillance program using Charpy impact specimens (weak orientation for the intermediate shell forging), and those data obtained following the ASME Code, Section III, Subarticle NB-2300 demonstrated the initial RTNDT following the methods in NRC BTP MTEB 5-2 to be conservative. The irradiated RTNDT, termed the ART, will be determined using the methods in NRC Regulatory Guide 1.99. As post-irradiation test results become available from the reactor vessel surveillance program materials (the intermediate shell forging and the core region weld metal), those data will be used to assess the accuracy and conservatism of the predictions."

Open Item 45:

"Revision 1 (effective August 12, 2010) to the Unit 2 System Description for the Reactor Coolant System (WBN2-68-4001) was revised to reflect the required revisions to the PTLR. Appendix B, Section 3.2 (Arming Temperature) states, "COMS shall be armed when any RCS cold leg temperature is <225°F."

Open Item 46:

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"Revision 1 (effective August 12, 2010) to the Unit 2 System Description for the Reactor Coolant System (WBN2-68-4001) was revised to reflect the required revisions to the PTLR. Appendix B, TABLE 3.1-1 (Watts Bar Unit 2 PORV Setpoints vs Temperature) contains the lift settings."
5.4.0	0	C	Approved for both units in SER.
5.4.1	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Page 1-8 of SSER22 has "2" in the "Note" column for this item. Note 2 reads, "During the assessment of the regulatory framework for completion of the project, the staff characterized certain topics as "Open" pending TVA's validation of the information contained in the section. TVA has determined that the information presented in the FSAR remained valid and only identified minor administrative or typographical changes to the section. TVA addressed the changes in their submittals and clearly indicated the changes. The staff reviewed and confirmed that the changes made to the section are administrative/typographical and do not impact its conclusions as stated in previous SSERs. Therefore, no additional review is necessary and the staff considers this section Resolved." Section 5.4.1.1 of SSER22 notes that Amendment 97 to the Unit 2 FSAR was the one reviewed for this section. SSER22 shows the status for this item as "Resolved."
5.4.2	22	C 06	5.4.2.2: OUTSTANDING ISSUE for staff to evaluate TVA's proposed resolution to concerns about flow induced vibrations in Model D-3 SGs pre-heat region In the original 1982 SER, the staff concluded that because of the generic problem of tube degradation caused by flow induced vibration in Westinghouse model D steam generators, operation would be limited to 50%. In SSER1, the staff continued to monitor activities associated with proposed modifications to the pre-heater region of the SGs to reduce impingement of water on tubes in this area and eliminate the vibration responsible for wear of the SG tubes. TVA's May 27, 1983, letter committed to implement the NUREG-0966 modifications to address this. In SSER4, the staff concluded the modification was acceptable to operate at 100%. In a letter dated December 17, 2008, TVA confirmed that these modifications were performed for WBN Unit 2. REVISION 06 UPDATE: Section 5.4.2.1 of SSER22 includes: "Based on the above, the NRC staff concludes that the steam generator materials will continue to meet the applicable regulatory criteria of GDC 1, 14, 15, and 31 and Appendix B to 10 CFR Part 50." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
5.4.3	23	CO --- 07	CONFIRMATORY ISSUE to verify installation of an RHR flow alarm and proper function of dump valves when actuated manually In the SER, staff accepted TVA's commitment to provide, before startup, an RHR flow alarm to alert the operator to initiate alternate cooling modes in the event of loss of RHR pump suction. SSER2 resolved testing of dump valves. The staff verified that the alarm had been installed in SSER5, resolving the confirmatory issue. Unit 2 action: Verify alarm installation. ---------- CONFIRMATORY ISSUE involving natural circulation test to demonstrate ability to cool down and depressurize the plant, and that boron mixing is sufficient under such circumstances; or, if necessary, other applicable tests before startup after first refueling Branch Technical Position requires a natural circulation test with supporting analysis to demonstrate the ability to cool down and depressurize the plant and that boron mixing is sufficient. Comparison with performance of previously tested plants of similar design is acceptable, if justified. July 11, 1991, TVA letter, for both units, provided an assessment of the acceptability of the Diablo Canyon natural circulation tests to WBN. In SSER10, the NRC found the methods and conclusions acceptable. The staff corrected the wording in SSER10 in SSER11 and stated that this did not alter the conclusion reached. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). ---------- ---------- REVISION 07 UPDATE: 5.4.3.3 (Conclusion) of SSER23 reads as follows: "The NRC staff has reviewed TVA's analyses related to the RHR system and concludes that TVA has shown that the RHR system will adequately cool the RCS following shutdown and will remove decay heat. Therefore, the NRC staff concludes that the RHR system complies with the requirements of GDC 4, 5, and 34 of Appendix A to 10 CFR Part 50." SSER23 shows the status for this item as "Resolved."
5.4.4	22	C --- 06	Approved for both units in SER. ---------- ---------- REVISION UPDATE: Section 5.4.4 of SSER22 includes: "Based on its evaluation of the information provided by TVA and its previous evaluation, as documented in the SER and its supplements, the NRC staff concludes that the failure of the pressurizer relief tank does not affect the integrity of the RCPB or the capability to shut down the plant safely. WBN Unit 2 FSAR Section 5.5.11 is, therefore, acceptable." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
5.4.5	23	CI 07	LICENSE CONDITION - NUREG-0737, II.B.1, "Reactor Coolant System Vents" - In the original SER, the NRC found TVA's commitment to install reactor coolant vents acceptable pending verification. In SSER2, the staff found venting guidelines acceptable. Installation was completed for Unit 1 only in SSER5 (IR 390/84-37) and the staff stated that the LC was no longer necessary. In SSER12, the staff included the safety evaluation for the RCSV system. The staff concluded that the high point vent system was acceptable subject to satisfactory completion of seven items that were described as on-going or planned activities associated with completion of the WB licensing process. They stated that none required additional review with respect to the SER nor would they change the SER, provided they were satisfactorily completed. TVA was asked to submit a letter prior to receipt of an OL stating how and when these items were completed. The staff stated that when these items were satisfactorily implemented, the RCSV system would be acceptable. Unit 2 Action: Verify installation of reactor coolant vents. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is "Open (Inspection)." ---------- ---------- REVISION 07 UPDATE: 5.4.5 of SSER23 reads as follows: "As stated in Section 5.4.5 of NUREG-0847, Item II.B.1, "Reactor Coolant System Vents," of NUREG-0737, "Clarification of TMI Action Plan Requirements," issued November 1980, requires the installation of RCS and reactor vessel head high point vents that are remotely operated from the control room. Section 5.5.6, "Reactor Vessel Head Vent System," of the WBN Unit 2 FSAR describes the RCS and reactor vessel head high point vent system. The NRC previously approved the system, as documented in NUREG-0847 and its supplements, particularly, Supplement 12, issued October 1993. In its submittal dated September 14,1981 (ADAMS Accession No. ML073521447), TVA committed to providing the same RCS vent system for WBN as approved by the NRC for Sequoyah Nuclear Plant in NUREG-01 11, "Evaluation of High-Temperature Gas-Cooled Reactor Particle Coating Failure Models and Data," Supplement 5, issued June 1981, and to using the venting guidelines developed by the Westinghouse Owners Group. The NRC staff concludes that TVA's commitments are acceptable, pending completion of the staff's generic review. Based on its review, the NRC staff concludes that the guidelines are acceptable for implementation, as documented in Generic Letter 83-22, "Safety Evaluation of Emergency Response Guidelines," dated June 3, 1983. Therefore, the staff's conclusions, as documented in NUREG-0847 and its supplements, remain valid, and the staff concludes that the WBN Unit 2 RCS vent system is acceptable, pending verification of the installation of the RCS vent system. This is Open Item 69 (Appendix HH)." SSER23 shows the status for this item as "Open (Inspection)." ---------- Open Item 69 (Appendix HH) reads as follows: "The WBN Unit 2 RCS vent system is acceptable, pending verification that the RCS vent system is installed. "(Section 5.4.5)
6.0.0	0	C	Approved for both units in SER.
6.1.0	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
6.1.1	23	O 07	Approved for both units in SER. REVISION 07 UPDATE: [All stated portions below are from SSER23] 6.1.1.4 (Technical Evaluation) includes: "In FSAR Amendment 97, TVA modified Section 6.1.1.1, "Materials Selection and Fabrication," to add the following sentence to the paragraph discussing the compatibility of the ESF system materials with containment sprays and core cooling water in the event of a LOCA: Note that qualified coatings inside primary containment located within the zone of influence are assumed to fail for the analysis in the event of a loss-of coolant accident. The zone of influence for qualified coatings is defined as a spherical zone with a radius of 10 times the break diameter. The staff's evaluation of the above information is Open Item 59 (Appendix HH), pending resolution of Generic Safety Issue 191, "Assessment of Debris Accumulation on Pressurized-Water Reactor (PWR) Sump Performance" (for background, see NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004) for WBN Unit 2." 6.1.1.5 (Conclusions) reads as follows: "Based on its review of the information provided by TVA, the NRC staff concludes that the controls on pH and chemistry of the reactor containment sprays and the emergency core cooling water following a loss-of-coolant or design-basis accident are adequate to reduce the probability of stress-corrosion cracking of the austenitic stainless steel components and welds of the ESF systems in containment throughout the duration of the postulated accident, from accident initiation to cleanup completion. Therefore, the staff concludes that TVA complies with the requirements of GDC 4, 35, and 41 and Appendix B to 10 CFR Part 50 with respect to the compatibility of ESF components with environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including LOCAs. The staff also concludes that control of the sprays and cooling water pH, in conjunction with controls on selection of containment materials, is consistent with RG 1.7 and provides assurance that the sprays and cooling water will not yield excessive hydrogen gas evolution from corrosion of containment metal or cause serious deterioration of the materials in containment." SSER23 shows the status for this item as "Open (NRR)." ---------- Open Item 59 (Appendix HH) reads as follows: "The staff's evaluation of the compatibility of the ESF system materials with containment sprays and core cooling water in the event of a LOCA is incomplete pending resolution of GSI-1 91 for WBN Unit 2. (Section 6.1.1.4)"
6.1.2	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 6.1.2 of SSER22 includes:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"The NRC staff reviewed Amendments 92 through 99 to the Watts Bar Nuclear Plant (WBN) Unit 2 final safety analysis report (FSAR). TVA made only minor changes to wording and format and maintained its commitment to meet the positions of RG 1.54, with the acceptable alternative to ANSI N101.4-1972 and the testing requirements of ANSI N101.2-1972. Based on the NRC staff's review of the information provided by TVA in its amendments to the FSAR, the staff concludes that the changes are acceptable. The staff's conclusions in the SER remain valid." SSER22 shows the status for this item as "Resolved."
6.1.3	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 6.1.3 of SSER22 includes: "In FSAR Amendments 92 through 99, TVA revised the final postaccident pH value from 8.1 to 7.5 and also made minor wording and format changes. TVA stated that the sump pH after a loss-of-cooling accident (LOCA) remains within the range of 7.5 to 10.0 for the duration of the event. Since the revised pH value remains within the acceptance criterion (greater than 7.0), the NRC staff concludes that the changes are acceptable." SSER22 shows the status for this item as "Resolved."
6.2.0	0	C	Approved for both units in SER.
6.2.1	22	O 06	6.2.1.1: CONFIRMATORY ISSUE involves reviewing analysis that ensures that containment external pressure will not exceed design value of 2.0 psi In the original 1982 SER, NRC indicated it would confirm the contention that containment external pressure transients could not exceed the design value of 2.0 psig. TVA submitted the information June 4, 1982. In SSER3, NRC concluded that the design provided adequate protection against damage from external pressure transients. In SSER5, the staff reviewed a revised long term containment analysis for the design basis LOCA in support of a proposed reduction in the limit for minimum allowable weight of ice in the condenser and found it acceptable. Additionally, the staff verified that containment pressure and water level monitors were installed in Unit 1. Thus, License Conditions 6d and 6e were resolved (these are discussed with the other NUREG-0737 issues). In SSER7, the staff resolved their concerns regarding local temperatures near MSLBs inside containment and their impact on equipment qualification. In SSER12, the staff reviewed TVA's basis for deleting requirements for a 20,000 ppm boron concentration in the boron injection tank and determined that this would not significantly affect the environmental response of the containment or the safe shutdown equipment therein. In SSER14, the staff reviewed revisions to a number of containment design parameters and concluded that none affect conclusions reached in the SER or supplements. In SSER15, the staff reviewed the containment barrier seals and associated surveillance requirements and concluded that a revised divider barrier seal surveillance program was appropriate for Unit 1.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Unit 2 Action: Review Unit 2 Technical Specifications with respect to divider barrier seal surveillance program. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. TS 3.6.13 provides the Limiting Condition for Operation for Divider Barrier Integrity. REVISION 06 UPDATE: Section 6.2.1 of SSER22 includes: "Based on its review of the information provided by TVA in FSAR Amendment 97, and its previous evaluation as documented in the SER and WBN Unit 1 License Amendment No. 33, the NRC staff concludes that the Unit 2 containment functional design meets the relevant requirements of GDC 2, 4, 16, 50, 38, 39, 40, 13, and 64 of Appendix A to 10 CFR Part 50 with respect to protection against natural phenomena, environmental effects, containment design, and monitoring radioactivity releases and that the design is consistent with the acceptance criteria in SRP Section 6.2.1." SSER22 shows the status for this item as "Resolved."
6.2.2	22	C --- 06	In SSER7, the staff determined that hot standby was an acceptable mode following a main steamline break and the containment cooling system modifications were acceptable. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Containment Cooling Special Program . In SSER21, the Containment Cooling SP was resolved. Completion of the Containment Cooling SP is tracked under 23.3.2. REVISION 06 UPDATE: Section 6.2.2 of SSER22 includes: "Based on its review of the information provided by TVA in FSAR Amendment 97 and its previous review, as documented in the SER, the NRC staff concludes that the design of the containment heat removal

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			system meets the relevant requirements of GDC 38, 39, and 40 and is consistent with the acceptance criteria in SRP Section 6.2.2." SSER22 shows the status for this item as "Resolved." ---------- NRC Inspection Report 391/2011-602 closed the Containment Cooling SP.
6.2.3	22	C --- 06	In SSER16, the staff reviewed Amendment 89 to the FSAR and deletion of the high-radiation signal from the auxiliary building exhaust vent monitors and found it acceptable. ---------- ---------- REVISION 06 UPDATE: Section 6.2.3 of SSER22 includes: "Based on its review of the information provided by TVA in FSAR Amendment 97 and its previous evaluation, as documented in the SER, the NRC staff concludes that the secondary containment functional design meets the relevant requirements of GDC 2, 4, 5, 16, 60, and 61, and Appendix J to 10 CFR Part 50 and is consistent with the acceptance criteria in SRP Section 6.2.3." SSER22 shows the status for this item as "Resolved."
6.2.4	22	C --- 07	CONFIRMATORY ISSUE to install safety grade isolation valves on 1" chemical feed lines joining feedwater lines to main steam line. LICENSE CONDITION – Modification of chemical feedlines In the original 1982 SER, the containment isolation provisions for the main and auxiliary feedwater lines, feedwater bypass lines and the chemical feedlines to the steam generators did not meet GDC 57. This was resolved by FSAR Amendment 55. In SSER5, the NRC concluded that the containment isolation provisions for the main and auxiliary feedwater lines, feedwater bypass lines and the chemical feedlines were acceptable. ---------- OUTSTANDING ISSUE for NRC to complete review of information provided by TVA to address Containment Purging During Normal Plant Operation LICENSE CONDITION - Containment isolation dependability In the original 1982 SER, NRC concluded that WBN met all the requirements of NUREG-0737, item II.E.4.2 except subsection (6) concerning containment purging during normal operation. In SSER3, the outstanding issue was closed and the LICENSE CONDITION was left open. NRC completed the review and issued a TER for both units on July 12, 1990. NRC concluded that the isolation valves can close against the buildup of pressure in the event of a design basis accident if the lower containment isolation valves are physically blocked to an opening angle of 50 degrees or less. (SSER5) Unit 2 Action: Reflect valve opening restriction in the Technical Specifications. ---------- OUTSTANDING ISSUE involving containment isolation using closed systems This outstanding issue was opened in SSER7. In SSER12, the NRC concluded that the systems in question were "closed loops outside containment" and reaffirmed the previous conclusion of acceptability.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			--- --- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS Surveillance Requirement 3.6.3.7 requires verification that the valves are "blocked to restrict the valve from opening > 50 degrees." --- --- REVISION 06 UPDATE: Section 6.2.4 of SSER22 includes: "Based on its review of the information provided by TVA, as discussed above, and its previous review as documented in the SER, the NRC staff concludes that the containment isolation systems meet the relevant requirements of GDC 16, 54, 55, 56, and 57 and the acceptance criteria of SRP Section 6.2.4 and are, therefore, acceptable." SSER22 shows the status for this item as "Resolved." --- --- REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed NUREG-0737, II.E.4.2.
6.2.5	22	O --- 06	OUTSTANDING ISSUE for review of TVA provided additional information relative to discussion added to FSAR to address analysis of the production and accumulation of hydrogen within containment following onset of a LOCA In the original 1982 SER, NRC indicated that additional information was required concerning the analysis of the production and accumulation of hydrogen within the containment during a design basis LOCA. This information was provided in FSAR amendments and evaluated by NRC in SSER4. In SSER4, the NRC concluded that the design of the combustible gas control system was acceptable and the outstanding issue closed. Unit 2 Action: The hydrogen recombiners will be removed from the Unit 2 design and licensing basis based on 10 CFR 50.44 (final rule September 16, 2003) and abandoned in place. This portion has a status of Open. --- LICENSE CONDITION – (6f) Accident monitoring instrumentation II.F.1 – containment hydrogen In SSER5, NRC closed the LICENSE CONDITION for Unit 1 only (IR 390/84-85). Unit 2 Action: Verify installation of containment hydrogen accident monitoring instrumentation. This portion has a status of Closed/Implementation only per NRC May 28, 2008, letter. ---

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			LICENSE CONDITION – (9) Hydrogen control measures In the original 1982 SER, an LC was raised to track resolution of Unresolved Safety Issue A-48, "Hydrogen Control Measures and Effects of Hydrogen Burns on Safety Equipment." In SSER8, the NRC reviewed the hydrogen mitigation system (igniters) and concluded it met the requirements of the final rule {10 CFR 50.44(c)(3)}. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. This amendment deleted the hydrogen recombiners from the Unit 2 FSAR. REVISION 04 UPDATE: EDCR 52329 was initiated to abandon in place Unit 2 hydrogen recombiners. Technical Specifications (TS) / TS BASES 3.6.7 (Hydrogen Recombiners) were deleted in Developmental Revision B which was submitted on February 2, 2010. REVISION 06 UPDATE: Section 6.2.5 of SSER22 includes: "Based on its review of the information provided by TVA, as discussed above, the NRC staff concludes that the design of the combustible gas control system meets the requirements of GDC 5; GDC 41, "Containment Atmosphere Cleanup"; GDC 42, "Inspection of Containment Atmosphere Cleanup Systems"; and GDC 43 and 10 CFR 50.44 and is, therefore, acceptable." SSER22 shows the status for this item as "Resolved."
6.2.6	22	S --- 06	In SSER4, the staff approved exemption from certain requirements of Appendix J to 10 CFR 50 for both units. In SSER19, the staff found a revised schedule for the exemption approved in SSER4 acceptable. In SSER5, the staff found there was no radiological consequence to an increase in the bypass leakage rate for the emergency gas treatment system and found the increase acceptable. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 06 UPDATE: Section 6.2.6 of SSER22 included, "The NRC staff noted that TVA's changes to Section 6.2.6 in FSAR Amendment 97, regarding the implementation of Option B of Appendix J, were incomplete,

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			because several statements remained regarding performing water-sealed valve leakage tests "as specified in 10 CFR [Part] 50, Appendix J." With the adoption of Option B, the specified testing requirements are no longer applicable; Option A to Appendix J retains these requirements. The NRC discussed this discrepancy with TVA in a telephone conference on September 28, 2010. TVA stated that it would remove the inaccurate reference to Appendix J for specific water testing requirements in a future FSAR amendment. This is Open Item 47 (Appendix HH)." SSER22 shows the status for this item as "Open (NRR)." ---------- TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 47: "TVA provided an update to FSAR Section 6.2.6 in Amendment 104."
6.2.7	23	C --- 07	CONFIRMATORY ISSUE for TVA to confirm that the lowest temperatures which will be experienced by the limiting materials of the reactor containment pressure boundary under the conditions cited by GDC 51 will be in compliance with the temperatures identified in the staff's analysis of fracture toughness requirements for load bearing component of the containment system In SSER4, NRC reviewed the confirmatory information submitted and concluded for both units that the reactor containment pressure boundary materials will behave in a non-brittle manner and the requirements of GDC 51 were satisfied. NRC provided the technical basis in Appendix H of SSER4. ---------- ---------- REVISION 07 UPDATE: 6.2.7 of SSER23 reads as follows: "The NRC staff reviewed the changes made by TVA in FSAR Amendment 97 to FSAR Section 3.1.2.4, "Fluid Systems," Criterion 31, and determined that the information related to fracture prevention of the containment pressure boundary had not been substantively changed. Therefore, based on its review of FSAR Amendment 97 and previous evaluations documented in the original NUREG-0847 and NUREG-0847, Supplement 4, dated March 1985, the staff concludes that measures taken by TVA to prevent fracture of the containment boundary continue to meet the relevant requirements of GDC 31 and are therefore acceptable." SSER23 shows the status for this item as "Resolved."
6.3.0	0	C --- 01	Approved for both units in SER.
6.3.1	11	S --- 02	OUTSTANDING ISSUE - involving removal of upper head injection system The Upper Head Injection (UHI) system design was approved in the original 1982 SER. TVA letter dated September 19, 1985, informed NRC that UHI would not be installed on Unit 2. The staff stated in SSER6 that they were continuing to review TVA's submittal. In SSER7, NRC concluded it was acceptable to delete UHI from both units. In SSER11, the staff stated that the revision of the design code for ECCS piping from B31.1 to ASME Section III did not change the conclusions made in the SER and previous SSERs. ---------- Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. This amendment revised the FSAR to address the application of RFA-2 fuel.
6.3.2	5	S 02	In SSER5, the staff reviewed TVA's approach to maintaining ECCS effectiveness by ensuring that no single failure would be able to energize the coils of the valve operators and found it acceptable. The staff also reviewed TVA's response to Issue 4 of NUREG-0138, Resequencing of ECCS loads following SI signal reset followed by a loss of offsite power. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. This amendment revised the FSAR to address the application of RFA-2 fuel.
6.3.3	9	S 02	OUTSTANDING ISSUE - involving containment sump screen design In the original 1982 SER, the staff approved the proposed sump design in the FSAR. A deviation between the installed and proposed design was discovered during an NRC inspection. In SSER9, the staff concluded that the as-installed sump screen was acceptable. CONFIRMATORY ISSUE - provide a detailed survey of insulation material that could be debris post-LOCA In the original 1982 SER, NRC found the design of the containment sump against debris acceptable subject to the acceptability of a detailed survey of insulation materials. In SSER2, the NRC review of the survey confirmed the staff's initial conclusion that the design to provide protection against sump debris was acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. This amendment revised the FSAR to address the application of RFA-2 fuel.
6.3.4	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
6.3.5	0	O 01	Closure based on 6.3.1 to 6.3.3.
6.4.0	22	C 06	In SSER5, the staff concluded that removal of the main control room air intake chlorine detector was acceptable. In SSER11, they stated that FSAR Amendment 69 on control room isolation did not change previous conclusions. In SSER16, the staff concluded that the control room design satisfied the requirements of GDC 19 and the guidelines of NUREG-0737, Item III.D.3.4. In SSER18, the staff reviewed updated control room air flow rate data and dose analysis, as provided in Amendment 90, and determined that the changes did not affect conclusions reached in the SER or its supplements. See 18.1.0 also. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 06 UPDATE: Section 6.4 of SSER22 included, "On this basis of the NRC staff's safety evaluation for WBN Unit 1 License Amendment No. 70 and its previous evaluation as documented in the SER, the staff concludes that the control room habitability systems meet the relevant requirements of TMI Action Plan Item III.D.3.4 and GDC 2, 4, and 19 and the guidance of RGs 1.52 and 1.78 and are, therefore, acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
6.5.0	0	C	Approved for both units in SER.
6.5.1	22	C 06	In SSER5, the staff found the Reactor Building Purge Ventilation System acceptable. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 06 UPDATE: Section 6.5.1 of SSER22 included, "The NRC staff has reviewed the information provided by TVA in FSAR Amendment 97 and concludes that the engineered safety feature atmosphere cleanup systems

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			meet the guidance of SRP Section 6.5.1, Revision 2. The design conforms to the guidelines of RG 1.52, Revision 2, and is, therefore, acceptable." SSER22 shows the status for this item as "Resolved."
6.5.2	0	C	Approved for both units in SER.
6.5.3	22	O 06	Approved for both units in SER. REVISION 06 UPDATE: Section 6.5.3 of SSER22 included, "The NRC staff should verify that its conclusions in the review of FSAR Section 15.4.1 do not affect the conclusions of the staff regarding the acceptability of Section 6.5.3. This is Open Item 48 (Appendix HH)." SSER22 shows the status for this item as "Open (NRR)." TVA to NRC letter dated June 7, 2011, provided the following response to this item: "No TVA action is required for this item."
6.5.4	0	C	Approved for both units in SER.
6.6.0	23	O 07	OUTSTANDING ISSUE on additional information required on preservice inspection program and identification of plant specific areas where ASME Code Section XI requirements cannot be met and supporting technical justification NRC reviewed the preservice inspection program (PSI) for Unit 1 only in SSER10 and on the basis of a TVA commitment to submit an inservice inspection program within 6 months after receiving an operating license, considered a proposed LC for an ISI no longer required. In SSER15, the staff reviewed Revisions 24 and 25 to the preservice inspection program and concluded that the changes included therein were acceptable. Unit 2 Action: Submit Unit 2 PSI program. REVISION 03 UPDATE: Preservice Inspection Plan, Program No. WBN-2 PSI, Revision 3 was submitted to the NRC on June 17, 2010 (ADAMS Accession No. ML101680561). REVISION 05 UPDATE: Corrected status from "O" to "S."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 07 UPDATE: [all portions are from SSER23] 6.6 reads as follows: "By letter dated June 17, 2010 (Agencywide Documents Access and Management System Accession No. ML101680561), TVA provided Revision 3 of its Preservice Inspection Program Plan to the NRC for review, in accordance with 10 CFR 50.55a, "Codes and Standards," for WBN Unit 2. Appendix Z to this supplemental safety evaluation report includes the NRC staff's evaluation of the WBN Unit 2 Preservice Inspection Program Plan." Appendix Z to this SSER includes the NRC staff's evaluation of the WBN Unit 2 Preservice Inspection Program Plan." 4.0 (Conclusions) of Appendix Z reads as follows: "The NRC staff reviewed TVA's submittal and concluded that IVA has addressed all of the regulatory requirements set forth in 10 CFR 50.55a and, based the staff's review of the documents listed in Section 6 of this report, no deviations from applicable regulatory requirements or TVA's commitments were identified in the PSI Program Plan, Revision 3, for WBN Unit 2. Open Item 70 (Appendix HH of SSER 23), as noted in Section 3.2.3 of this report, remains open pending NRC staff verification of the populations and the number of required examinations in accordance with the reference code." SSER23 shows the status for this item as "Open (NRR)."
7.0.0	0	C	Approved for both units in SER.
7.1.0	0	C	Approved for both units in SER.
7.1.1	23	C 07	In SSER13, NRC reviewed the Eagle-21 upgrade for WBN Unit 1 only. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. By letter dated August 21, 1995 for both units, TVA provided additional justification for a deviation from Position C.6(a) of RG 1.118 "Periodic Testing of Electrical Power and Protection Systems" Revision 2. In SSER16, the NRC found the deviation acceptable. REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 07 UPDATE: 7.1.1 of SSER23 includes: "Therefore, based on the staff's previous evaluation, as documented in the SER and its supplements, and the staff's evaluation of TVA's amendments to the FSAR, the staff concludes that the information provided in FSAR Section 7.1.1 meets the relevant requirements of the SRP and is acceptable." SSER23 shows the status for this item as "Resolved."
7.1.2	23	C 07	Approved for both units in SER. REVISION 06 UPDATE: Page 1-10 of SSER22 has "1" in the "Note" column for this item. Note 1 reads, "In the process of further validating the information in the WBN Unit 2 FSAR, TVA identified minor administrative/typographical changes to sections previously considered Resolved. TVA addressed these changes to the applicable sections in their submittals and clearly indicated them to the staff. The staff has reviewed and confirmed that the changes made are administrative/typographical and do not impact the staff's conclusions as stated in previous SSERs. Based on this review, no additional review is necessary and this section remains Resolved." SSER22 shows the status for this item as "Resolved." REVISION 07 UPDATE: 7.1.2 of SSER23 reads: "TVA's comparison of WBN Unit 2 with other plants is referenced in FSAR Section 7.1.1.4. TVA states in the FSAR that "System functions for all systems discussed in Chapter 7 are similar to those of Sequoyah Nuclear Plant. Detailed comparison is provided in Section 1.3." TVA made no changes to the discussion in FSAR Section 7.1.1.4 from those previously reviewed and approved by the staff. Therefore, no staff review is required for this section." SSER23 shows the status for this item as "Resolved."
7.1.3	23	O 07	In the SER, NRC indicated that a review of the setpoint methodology would be performed with a review of the Technical Specifications. In SSER4, NRC reviewed the methodology used to determine setpoints for Watts Bar Units 1 and 2 and determined that it was acceptable. By letter dated July 29, 1994, for both units, TVA submitted a topical report titled "Westinghouse Setpoint Methodology for Protection Systems, Watts Bar Units 1 and 2, Eagle 21 Version" (WCAP-12096, Revision 6). In SSER15, the NRC concluded the setpoint methodology was acceptable based on (1) previous acceptance of Westinghouse setpoint methodology at other plants, (2) the similarity between the Watts Bar and previously approved designs such as Sequoyah, and (3) the Watts Bar setpoint methodology is in compliance with RG 1.105 and ISA S6704. Staff requested discussion of methodology for determining, setting, and evaluating as-found setpoints for drift susceptible instruments. Unit 2 action: Resolve this issue using the BFN TS-453 precedent (see NRC ML061680008).

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) and TS Bases was submitted on February 2, 2010. As part of the submittal, TVA incorporated TSTF-493, Revision 4, "Clarify Application of Setpoint Methodology for LSSS Functions," into Section 3.3 of the TS and TS Bases. TVA submitted WCAP-17044, "Westinghouse Setpoint Methodology for Protection Systems" on February 5, 2010. REVISION 07 UPDATE: 7.1.3 of SSER23 includes: "FSAR Section 7.1.2.1.8 describes the functional diversity of the design of the reactor protection system (RPS). TVA added a new reference to Westinghouse topical report WCAP-13869, 'Reactor Protection System Diversity in Westinghouse Pressurized Water Reactors,' Revision 2, September 1994, to the section. Revision 1 of the topical report was reviewed and approved by the staff for Unit 1 in Section 7.2.1.2, 'Watts Bar Specific Issues, of SSER 13, issued April 1994. It is unclear to the staff why different revisions of WCAP-1 3869 are referenced for the two units. TVA should provide justification to the staff for why different revisions of WCAP-13869 are referenced for WBN Unit 1 and Unit 2. This is Open Item 65 (Appendix HH), as discussed in Section 7.2, 'Reactor Trip System,' of this SSER." SSER23 shows the status for this item as "Resolved." It appears that this should be "Open (NRR)." Open Item 65 (Appendix HH) reads as follows: "TVA should provide justification to the staff regarding why different revisions of WCAP-1 3869 are referenced in WBN Unit 1 and Unit 2. (Section 7.2.1.1)
7.2.0	0	C	Approved for both units in SER.
7.2.1	23	O 07	In SSER13, NRC reviewed the Eagle-21 upgrade for WBN Unit 1 only. In SSER15, the NRC reviewed the WBN Unit 1 EMI/RFI report and concluded that the EMI/RFI issue was resolved for WBN Unit 1. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008.

* = See last page for status code definition.

REVISION 07 UPDATE:

7.2.1.1 of SSER23 includes:

"By letter dated December 5, 2007 (ADAMS Accession No. ML073440022), TVA informed the NRC staff that it had made one design change to the WBN Unit 1 Eagle 21 system under 10 CFR 50.59, "Changes, Tests and Experiments," after initial licensing. This change involved the installation of an external communication interface that included a serial-to-Ethernet controller (SEC) board in each of the multiple-bus chassis in the Eagle 21 system. The SEC uses the multiple-bus chassis to obtain power only. The SEC receives a datalink message in parallel with the test sequence processor and feeds the message to the integrated computer system (ICS). The link is designed such that a nonsafety-related signal cannot feed back to the safety-related Eagle 21 system. However, TVA did not confirm that testing demonstrated that two-way communication is impossible. This was an open item in the NRC audit at the Westinghouse facility (open item number 3 of ADAMS Accession No. ML102240630). By letter dated October 21, 2010 (letter open item number 171; ADAMS Accession No. ML1 03140661), TVA stated that "The external Eagle 21 unidirectional communications interface will be tested prior to WBN Unit 2 fuel load." This is Open Item 63 (Appendix HH) until TVA confirms that testing has demonstrated that two-way communication is impossible with the Eagle 21 communications interface."

AND

"By letter dated June 18, 2010 (letter open item number 127), TVA stated that the Eagle 21 system factory acceptance test of Rack 2 revealed that the temperature inputs to the narrow-range resistance temperature detector (RTD) were consistently reading about 0.2 degrees Fahrenheit higher than expected. Westinghouse determined that it had incorrectly configured the inputs as a shared RTD in the LCP software. Westinghouse initiated Corrective Action Item 10-140-M021 and performed an evaluation of a potential nuclear safety issue. It determined that this issue does not represent a substantial safety hazard even if it is left uncorrected. By letter dated October 29, 2010 (letter open item number 128; ADAMS Accession No. ML1 03120711), TVA described the final resolution proposed by Westinghouse. In accordance with the proposed resolution, the spare input available on the RTD input board will be wired to the active channels. The spare input will provide the parallel resistance to resolve the problem. Jumpers will be installed at the Eagle 21 termination frame to provide a parallel connection from each existing narrow-range RTD input to an existing spare input, thus simulating the hardware connection for shared RTDs. Therefore, as configured, the LCP will provide the correct temperature calculation for the narrow-range RTDs. TVA stated that "Post modification testing will be performed to verify that the design change corrects the Eagle 21, Rack 2 RTD accuracy issue prior to WBN Unit 2 fuel load." This is Open Item 64 (Appendix HH) pending NRC staff review of the testing results."

AND

"In Section 7.2 of WBN Unit 2 FSAR Amendment 96, TVA references Revision 2 of WCAP-13869, but the Unit 1 FSAR references Revision 1. Revision 1 was reviewed and approved by the staff for Unit 1 in Section 7.2.1.2 of SSER 13, issued April 1994. The staff asked TVA to justify the different reference for Unit 2. In Attachment 12 to its response (letter open item number 323) to the staff dated October 29, 2010, TVA identified that the differences between Revisions 1 and 2 are based on TVA's decision to not insulate the steam generator level transmitter reference leg on Unit 2. As the WBN Unit 1 and Unit 2 designs for the steam generator reference leg are the same, it is unclear to the staff why different revisions of WCAP-1 3869 are referenced for the two units. TVA should provide justification to the staff regarding why different revisions of WCAP-13869 are referenced in WBN Unit I and Unit 2. This is Open Item 65 (Appendix HH).

The NRC staff reviewed the additional changes made by TVA to WBN Unit 2 FSAR Section 7.2 and concluded that the changes were editorial or administrative in nature or were made to improve consistency with other FSAR sections. Because the additional changes are nonsubstantive, they were acceptable to the staff."

SSER23 shows the status for this item as "Open (NRR)."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Open Item 63 (Appendix HH) reads as follows: "TVA should confirm to the NRC staff that testing prior to Unit 2 fuel load has demonstrated that two-way communications is impossible with the Eagle 21 communications interface. (Section 7.2.1.1)" ---------- Open Item 64 (Appendix HH) reads as follows: "TVA stated that, "Post modification testing will be performed to verify that the design change corrects the Eagle 21, Rack 2 RTD accuracy issue prior to WBN Unit 2 fuel load." This issue is open pending NRC staff review of the testing results. (Section 7.2.1.1)" ---------- Open Item 65 (Appendix HH) reads as follows: "TVA should provide justification to the staff regarding why different revisions of WCAP-1 3869 are referenced in WBN Unit 1 and Unit 2. (Section 7.2.1.1)
7.2.2	23	C --- 07	Approved for both units in SER. REVISION 06 UPDATE: Page 1-10 of SSER22 has "1" in the "Note" column for this item. Note 1 reads, "In the process of further validating the information in the WBN Unit 2 FSAR, TVA identified minor administrative/typographical changes to sections previously considered Resolved. TVA addressed these changes to the applicable sections in their submittals and clearly indicated them to the staff. The staff has reviewed and confirmed that the changes made are administrative/typographical and do not impact the staff's conclusions as stated in previous SSERs. Based on this review, no additional review is necessary and this section remains Resolved." SSER22 shows the status for this item as "Resolved." REVISION 07 UPDATE: 7.2.2 of SSER23 reads: "The NRC staff reviewed WBN Unit 2 FSAR Amendments 96 through 101 and concluded that TVA made no substantive changes to FSAR Section 7.2.2. Therefore, the staff's conclusions as documented in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.2.3	23	C --- 07	Approved for both units in SER. REVISION 06 UPDATE: Page 1-10 of SSER22 has "1" in the "Note" column for this item.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Note 1 reads, "In the process of further validating the information in the WBN Unit 2 FSAR, TVA identified minor administrative/typographical changes to sections previously considered Resolved. TVA addressed these changes to the applicable sections in their submittals and clearly indicated them to the staff. The staff has reviewed and confirmed that the changes made are administrative/typographical and do not impact the staff's conclusions as stated in previous SSERs. Based on this review, no additional review is necessary and this section remains Resolved." SSER22 shows the status for this item as "Resolved." REVISION 07 UPDATE: 7.2.3 of SSER23 reads: "The NRC staff reviewed WBN Unit 2 FSAR Amendments 96 through 101 and concluded that TVA made no substantive changes to FSAR Section 7.2.3. Therefore, the staff's conclusions as documented in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.2.4	23	C --- 07	Approved for both units in SER. REVISION 07 UPDATE: 7.2.4 of SSER23 reads: "The NRC staff reviewed WBN Unit 2 FSAR Amendment 96 and concluded that TVA made no substantive changes to Section 7.2.1.1.2(6), 'Reactor Trip on a Turbine Trip.' Therefore, the staff's conclusions as documented in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.2.5	23	CO --- 07	CONFIRMATORY ISSUE - address IEB 79-21 to alleviate temperature dependence problem associated with measuring SG water level In SSER2, NRC accepted TVA's commitment to insulate the steam generator water level reference legs to alleviate the temperature dependence problem. By letter dated July 27, 1994, TVA submitted an evaluation for both units and determined that it was not necessary to insulate the SG reference legs at WBN. In SSER14, NRC concurred with TVA's assessment to not insulate the steam generator water level instrument reference leg. Unit 2 Action: Update accident calculation. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 07 UPDATE:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			7.2.5 of SSER23 reads: "By letter to the NRC dated July 27, 1994 (ADAMS Accession No. ML073230681), TVA withdrew its commitment to insulate the reference leg of the steam generator water level transmitters. TVA provided an analysis to justify its action, WCAP-1 3869, 'Reactor Protection System Diversity in Westinghouse Pressurized-Water Reactor,' Revision 1, November 1993, which was accepted by the staff as documented in SSER 13, issued April 1994. The staff asked TVA to confirm whether the reference leg of the steam generator water level transmitters is insulated and, if not, to confirm that the analysis that was submitted for WBN Unit 1 is also applicable to Unit 2. In its response (letter open item number 292) to the staff by letter dated October 21, 2010, TVA informed the staff that the reference leg is not insulated and that the analysis provided for WBN Unit 1 is also applicable to Unit 2. TVA's analysis for feedwater line break inside the containment credits the high containment pressure safety injection (SI) signal. The staff verified that TVA revised FSAR Section 15.4.2.2 to reflect that information. Therefore, based on the previous acceptance of the analysis documented in SSER 13, the staff considers TVA's response to be acceptable." SSER23 shows the status for this item as "Resolved."
7.2.6	23	C --- 07	In SSER13, NRC reviewed the Eagle-21 upgrade for WBN Unit 1 only. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. "CONCLUSIONS" left open until all actions in subsection are closed. --- --- REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008. --- --- REVISION 07 UPDATE: 7.2.6 of SSER23 includes: "Based on the NRC staff's prior evaluation, as documented in the SER and its supplements, in particular SSER 2 (issued January 1984), SSER 13, SSER 14 (issued December 1994), and SSER 15, and the staff's review of WBN Unit 2 FSAR Amendments 96 through 102, the staff concludes that the information in FSAR Section 7.2 continues to comply with applicable regulatory requirements and that the staff's conclusions in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.3.0	13	S --- 02	In SSER13, NRC reviewed the Eagle-21 upgrade for WBN Unit 1 only. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. ---

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008.
7.3.1	23	C 07	In SSER13, NRC reviewed the Eagle-21 upgrade for WBN Unit 1 only. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. In SSER14, NRC reviewed TVA's FSAR amendment 81 section 7.3.2.2.6, with respect to a deviation from IEEE Standard 279-1971. Manual initiation of both steamline isolation and switchover from injection to recirculation following a loss-of-primary-coolant accident are performed at the component level only. In SSER14, NRC agreed with TVA's justification. REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008. REVISION 07 UPDATE: 7.3.1 of SSER23 includes: "These changes to the FSAR do not involve any physical modifications to the plant or modify the safety function of any equipment. The changes do not affect setpoints or safety limits and thus do not reduce any margins of safety as defined in the TS. Therefore, the NRC staff finds them to be acceptable for WBN Unit 2." SSER23 shows the status for this item as "Resolved."
7.3.2	23	C 07	CONFIRMATORY ISSUE is commitment to make a design change to provide protection that prevents debris from entering containment sump level sensors In the original SER, staff identified a concern that debris in the containment sump could block the inlets to the differential pressure transmitters and result in a loss of the permissive signal to the initiation logic for the automatic switchover from the injection to the recirculation mode of the emergency core cooling system. In a September 15, 1983, letter TVA notified NRC that the level sensors had been moved from inside the sump wall to outside the sump wall with the sense line opening protected by a cap with small holes. Staff closed the issue in SSER2. REVISION 07 UPDATE: 7.3.2 of SSER23 includes:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"By letter dated October 18, 1999 (ADAMS Accession No. ML073240682), TVA informed the NRC staff that it had replaced the containment sump level transmitters in WBN Unit 1 under the provisions of 10 CFR 50.59. DCN-39608 states that the old transmitters had problems with the capillary tubing leaking fill fluid and with maintaining the transmitter within calibration. The new transmitters are Class 1 E qualified, do not have capillary tubing, and can be submersed during a LOCA. TVA stated that functional performance and protective logic are not affected. The same replacement has been performed for WBN Unit 2 under EDCR-52419. The staff has reviewed DCN-39608 and EDCR-52419 and, because the functional performance and protective logic are not affected, the staff concludes that the approach is acceptable for WBN Unit 2. WBN Unit 2 FSAR Amendment 95 addresses changes to Section 6.3.5.4, 'Level Indication.' All of the changes made by TVA were editorial or administrative in nature or were made to improve consistency with other FSAR sections. Therefore, based on its previous evaluation, as documented in the SER and SSER 2, and on its evaluation of subsequent changes, as described above, the staff concludes that the information provided by TVA meets the relevant requirements identified in the SRP and that the staff's conclusions in the SER and SSER 2 remain valid." SSER23 shows the status for this item as "Resolved."
7.3.3	23	C --- 07	Approved for both units in SER. REVISION 06 UPDATE: Page 1-11 of SSER22 has "1" in the "Note" column for this item. Note 1 reads, "In the process of further validating the information in the WBN Unit 2 FSAR, TVA identified minor administrative/typographical changes to sections previously considered Resolved. TVA addressed these changes to the applicable sections in their submittals and clearly indicated them to the staff. The staff has reviewed and confirmed that the changes made are administrative/typographical and do not impact the staff's conclusions as stated in previous SSERs. Based on this review, no additional review is necessary and this section remains Resolved." SSER22 shows the status for this item as "Resolved." REVISION 07 UPDATE: 7.3.3 of SSER23 includes: "Based on the staff's prior evaluation documented in the SER and on its evaluation of submitted changes, the information provided by TVA meets the relevant requirements identified in the SRP, and the staff's conclusions in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.3.4	23	C --- 07	Approved for both units in SER. REVISION 07 UPDATE: 7.3.4 of SSER23 includes:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"The NRC staff reviewed WBN Unit 2 FSAR Amendments 92 through 103 and concluded that TVA made no functional changes to Section 7.3.2.1, 'System Reliability/Availability and Failure Mode and Effects Analyses.' All of the changes were editorial or administrative in nature or were made to improve consistency with other FSAR sections. Therefore, based on the staff's prior evaluation, as documented in the SER, and on the staff's evaluation of submitted changes, the information provided in FSAR Section 7.3.4 continues to meet the relevant requirements identified in the SRP, and the staff's conclusions in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.3.5	23	CI --- 07	CONFIRMATORY ISSUE - perform confirmatory tests to satisfy IEB 80-06 (to ensure that no device will change position solely due to reset action) and staff review of electrical schematics for modifications that ensure that valves remain in emergency mode after ESF reset In the original SER, staff concluded that the design modifications for Bulletin 80-06 were acceptable subject to review of the electrical schematics that were not available at the time. In SSER3, the staff found the modifications acceptable and closed the confirmatory issue. Unit 2 Action: Perform verification during preoperational testing. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). --- --- REVISION 07 UPDATE: 7.3.5 of SSER23 includes: "In its letter to the NRC staff dated March 11, 1982 (ADAMS Accession No. ML073530129), TVA provided a list of all the safety-related equipment that does not remain in its emergency mode after an ESF reset. TVA evaluated this equipment and determined that it does not impact the safety of the plant or the ability to achieve and maintain safe shutdown. The NRC staff concluded in SSER 3 that TVA's justification was acceptable. In response to NRC staff Request for Additional Information (RAI) 7.3-6, TVA confirmed in its letter dated November 9, 2010 (ADAMS Accession No. ML1 03200146) that the feedwater isolation valves, the main feedwater check valve bypass valves, the upper tap main feedwater isolation valves, the steam generator blowdown isolation valves, and the RHR heat exchanger outlet flow control valves will remain in the emergency mode after an ESF reset. In response to a staff question, TVA stated in its letter dated November 24, 2010 (item number 330; ADAMS Accession No. ML1 03330501) that subsequent design changes have impacted the March 11, 1982, response such that some equipment that originally changed state no longer does so and some equipment has been deleted. TVA stated that no additions have been made to its original list dated March 11, 1982. Therefore, based on the staff's prior evaluation, as documented in the SER and SSER 3, and on its evaluation of the information provided by TVA in response to staff questions, the conclusions in the SER and SSER 3 remain valid." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.3.6	23	C --- 07	In SSER13, NRC reviewed the Eagle-21 upgrade for WBN Unit 1 only. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. "CONCLUSIONS" left open until all actions in subsection are closed. --- --- REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008. --- --- REVISION 07 UPDATE: 7.3.6 of SSER23 includes: "Based on the staff's previous evaluations, as documented in the SER and SSER 2, SSER 3, and SSER 14, and on its review of WBN Unit 2 FSAR Amendments 92 through 103, the information provided in FSAR Section 7.3 meets the relevant requirements identified in the SRP, and the staff's conclusions in the SER and its supplements remain valid." SSER23 shows the status for this item as "Resolved."
7.4.0	0	C ---	Approved for both units in SER.
7.4.1	23	C --- 07	Approved for both units in SER. --- --- REVISION 07 UPDATE: 7.4.1 of SSER23 includes: "In response to staff questions, TVA stated in its letter to the NRC staff dated July 30, 2010 (letter item number 12; ADAMS Accession No. ML102160349, not publicly available), that there are no technical differences between the WBN Unit 1 and WBN Unit 2 FSAR Sections 7.4. The NRC staff reviewed WBN Unit 2 FSAR Amendments 92 through 103 and concluded that the changes made by TVA to Section 7.4 were editorial or administrative in nature or were made to improve consistency with other FSAR sections. Therefore, the staff's conclusions as documented in the SER remain valid." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.4.2	23	C --- 07	By letter dated September 26, 1985, TVA requested a deviation from 10 CFR Part 50, Appendix R, Section III.L.2.d for use of the SG saturation temperatures to approximate reactor coolant system cold leg temperatures. This was approved for both units by SE dated May 17, 1991. The SE was discussed in SSER7. The staff concluded that this was an acceptable deviation. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 07 UPDATE: 7.4.2 of SSER23 reads: "The staff reviewed WBN Unit 2 FSAR Amendments 92 through 103 and concluded that TVA's changes were editorial or administrative in nature or were made to improve consistency with other FSAR sections. Therefore, the staff's conclusions as documented in the SER and SSER 7, dated September 1991, remain valid." SSER23 shows the status for this item as "Resolved."
7.4.3	23	C --- 07	Approved for both units in SER. REVISION 07 UPDATE: 7.4.3 of SSER23 reads: "Based on the its prior evaluation, as documented in the SER and SSER 7, and on its review of WBN Unit 2 FSAR Amendments 92 through 103, the staff concludes that the information provided in FSAR Section 7.4 continues to meet the relevant requirements identified in the SRP, and that the staff's conclusions in the SER and SSER 7 remain valid." SSER23 shows the status for this item as "Resolved."
7.5.0	0	C ---	Approved for both units in SER.
7.5.1	23	C --- 07	Approved for both units in SER. REVISION 07 UPDATE: 7.5.1.1.4 (Conclusions) of SSER23 reads: "The NRC staff reviewed the proposed ICS system for WBN Unit 2. The ICS is a nonsafety-related computer network that acquires, processes, and displays data to support the plant assessment capabilities of the MCR, TSC, EOF, and NDL. In addition to providing the data links needed to support the TSC, EOF, and NDL, the ICS also provides the functions of the SPDS and the BISI system. The staff evaluated the system designs against the applicable regulatory criteria and concluded that, for those

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			aspects of the design that were not substantially different from WBN Unit 1, the staff's previous conclusions, as documented in the SER and SSERs, remain valid. Further, where the WBN Unit 2 design was substantively different from that of WBN Unit 1, the staff concluded that TVA's design appropriately addresses the staff's regulatory criteria for quality (GDC I and 10 CFR 50.55a(a)(1)), control and protection system separation (GDC 24 and IEEE 279-1971, Clause 4.7), and the specific requirements for each display system (NUREG-0737, Supplement 1, or RG 1.47), as described above, and, therefore, is acceptable. SSER23 shows the status for this item as "Resolved."
7.5.2	25	OI 08	OUTSTANDING ISSUE involving RG 1.97 instruments following course of an accident In the original 1982 SER, the staff stated that WBN did not use RG 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plants and Environs Conditions During and Following an Accident," for the design because the design predated the RG. In SSER7, an outstanding issue was opened. TVA provided NRC information on exceptions to RG 1.97. A detailed review was performed for both units (Appendix V of SSER9). The staff concluded that WBN conforms to or has adequately justified deviations from the guidance of RG 1.97, Revision 2. TVA submitted additional deviations for both units in letters dated May 9, 1994, and April 21, 1995. In SSER14 and SSER15, the additional deviations to RG 1.97 were reviewed and accepted by NRC. NUREG-0737, II.F.1.2, ""Accident Monitoring Instrumentation" – Reviewed in SSER9. Unit 2 Actions: Install Noble gas, Iodine / particulate sampling, and Containment High Range Monitors. CI in NRC May 28, 2008, letter. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- --- REVISION 07 UPDATE: [all portions are from SSER23] 7.5.2.2.3 includes: "SRP Section 7.5, Revision 5 identifies IEEE Std. 603-1991 as being applicable to accident monitoring instrumentation. Based on its review of this item, the staff has the following open items: * TVA should provide to the staff either information that demonstrates that the WBN Unit 2 Common Q PAMS meets the applicable requirements in IEEE Std. 603-1991, or justification for why the Common Q PAMS should not meet those requirements. This is Open Item 94 (Appendix HH). * TVA should update FSAR Table 7.1-1, 'Watts Bar Nuclear Plant NRC Regulatory Guide Conformance,' to reference IEEE Std. 603-1991 for the WBN Unit 2 Common Q PAMS. This is Open Item 95 (Appendix HH). AND "The NRC staff's detailed evaluation of the Common Q PAMS equipment against the environmental criteria is addressed in SSER Section 7.5.2.2.3.5. RG 1.100, Revision 1 is used, in part, to address WBN Unit 2 Design Criterion 2. Based on its review of this item, the NRC staff has the following open item: * TVA should (1) update FSAR Table 7.1-1 to include RG 1.100, Revision 3 for the Common Q PAMS, or (2) demonstrate that the Common Q PAMS is in conformance with RG 1.100, Revision 1, or (3) provide

* = See last page for status code definition.

justification for not conforming. This is Open Item 96 (Appendix HH)."

AND

"Based on the reasoning quoted above, the staff concludes that TVA did not evaluate the Common Q PAMS against the criteria of RG 1.153, Revision 1; therefore, the staff has the following open item (see also Open Items 94 and 95 above):

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.153, Revision 1 or provide justification for not conforming. This is Open Item 97 (Appendix HH)."

AND

"Based on the review of this item, the NRC staff has the following open item:

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.152, Revision 2, or provide justification for not conforming. This is Open Item 98 (Appendix HH)."

AND

"The WBN Unit 2 FSAR references IEEE 7-4.3.2-1982, 'IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations,' as endorsed by RG 1.152, Revision 0 for the Eagle 21 system. The current staff position is documented in RG 1.152, Revision 2, which endorses IEEE Std. 7-4.3.2-2003, 'IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations,' as an acceptable method for using digital computers to meet IEEE Std. 603-1991. Based on the review of this item, the NRC staff has the following open item:

* TVA should update FSAR Table 7.1-1 to reference IEEE 7-4.3.2-2003 as being applicable to the WBN Unit 2 Common Q PAMS. This is Open Item 99 (Appendix HH)."

AND

"The current staff positions are documented in RG 1.168, Revision 1, IEEE 1012-1998; and IEEE 1028-1997. Based on its review of this item, the NRC staff has the following open item:

* TVA should update FSAR Table 7.1-1 to reference RG 1.168, Revision 1, IEEE Std. 1012-1998, and IEEE 1028-1997 as being applicable to the WBN Unit 2 Common Q PAMS. This is Open Item 100 (Appendix HH)."

AND

"The Common Q PAMS was designed and implemented in accordance with the SPM, which was found by the NRC staff to meet the requirements of RG 1.168, Revision 0, issued September 1997; IEEE Std. 1012-1986, 'IEEE Standard for Software Verification and Validation Plans'; and IEEE Std. 1028-1988, 'IEEE Standard Software Reviews and Audits.' (See NRC reports (1) 'Safety Evaluation by the Office of Nuclear Reactor Regulation CE Nuclear Power Topical Report CENPD-396-P 'Common Qualified Platform' Project No. 692,' issued August 2000, Section 4.3.1 .j, 'Software Verification and Validation Plan' (ADAMS Accession No. ML003740165), and (2) WCAP-16096-NP-A, 'Software Program Manual for Common Q Systems,' Revision 1A, NRC safety evaluation incorporated into the document, Section 2, 'Regulatory Evaluation' (ADAMS Accession No. ML050350234)). Based on its review of this item, the staff has the following open item:

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS application software is in conformance with RG 1.168, Revision 1 or provide justification for not conforming. This is Open Item 101 (Appendix HH).

AND

"The WBN Unit 2 FSAR does not reference Regulatory Guide 1.209, which endorses IEEE Std. 323-2003, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations.' TVA did not perform a comparison evaluation of the Common Q PAMS with the criteria in RG 1.209. Based on its review, the NRC staff has the following open items:

* TVA should update FSAR Table 7.1-1 to reference RG 1.209 and IEEE Std. 323-2003 as being applicable to the WBN Unit 2 Common Q PAMS. This is Open Item 102 (Appendix HH).

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS conforms to RG 1.209 and IEEE Std. 323-2003 or provide justification for not conforming. This is Open Item 103 (Appendix HH)."

AND

"TVA did not provide a comparison evaluation of Common Q PAMS to the criteria in IEEE Std. 323-2003. (See Open Item 103 above.)"

7.5.2.2.3.4.1 includes:

"The NRC revised RG 1.152 and 1.168 after the staff's approval of the SPM. Open Item Nos. 98 and 101 address the acceptability of the SPM for complying with the guidance of RGs 1.152 and 1.168, respectively (Appendix HH). The remaining RGs used to determine the acceptability of the SPM have not changed, and the processes described in the SPM have not changed; therefore, the staff considers the SPM to be acceptable for these unchanged aspects."

7.5.2.2.3.4.2 includes:

"The NRC staff will review the WEC self-assessment to verify that the WBN Unit 2 PAMS complies with the V&V requirements in the SPM or that deviations from the requirements are adequately justified. This is Open Item 104 (Appendix HH)."

7.5.2.2.3.4.2.2 includes:

"During its audit from February 28 to March 4, 2011, of the WEC CGD activities, the NRC staff examined implementation of the vendor's SWP, as specified in SPM Section 5, for the WBN Unit 2 Common Q PAMS. The staff concluded that only some aspects of the SWP were followed, and that the QA oversight of the SPM did not identify the discrepancies. As described above in SSER Section 7.5.2.2.3.4.2, 'Software Implementation Documentation,' TVA/WEC took project-specific and generic action items to address the discrepancies. The NRC staff's verification of these actions is included in Open Item 104 (Appendix HH). Pending closure of Open Item 104, the NRC staff concludes that implementation of V&V for the Common Q PAMS is acceptable."

7.5.2.2.3.4.2.4 includes:

"The SPM describes the software testing and documents that TVA will create (e.g., SPM Section 5.8, 'V&V Test Documentation Requirements,' Section 8.8, 'Test Documentation'). The SPM also describes the testing tasks that TVA is to carry out. The acceptance criterion for software test implementation is that the tasks in the SPM have been carried out in their entirety. The three subsections below address the three different testing activities evaluated by the NRC staff. Other aspects regarding the acceptability of testing activities are addressed in Open Items Nos. 101 and 104 (Appendix HH)."

7.5.2.2.3.4.3.1 includes:

"The audit report (ADAMS Accession No. ML1 10691232, not publicly available) stated the following:

For the WBN2 PAMS project, Westinghouse will provide documentation in their Rockville MD offices demonstrating that each document requiring independent review was in fact independently reviewed. CAPs No. 11-061-M047 will contain a commitment to provided documented evidence of appropriate

independent reviews.

This is included in Open Item 104 (Appendix HH)."

AND

"Based on (1) the review of the SysRS and SRS, (2) the audit of the RTMs, and (3) the review of the traceability analysis in the LTR, the staff has the following open items (Appendix HH):

* Open Item 105: TVA should provide to the NRC staff an acceptable description of how the WBN Unit 2 Common Q PAMS SysRS and SRS implement the design-basis requirements of IEEE Std. 603-1991, Clause 4.

* Open Item 106: TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SRS is independently reviewed."

7.5.2.2.3.4.3.2 includes:

"The SDDs do not include any documented evidence that they were independently reviewed. As a result, the NRC staff has the following open item (Appendix HH):

* Open Item 107: TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SDDs are independently reviewed."

7.5.2.2.3.5.2 includes:

"Table 5.3-1 of the qualification summary report provides the test environmental conditions from the various test programs. Based on the NRC staff's review of the test program results, the staff concluded that the required environmental test conditions satisfy the WBN Unit 2 plant-specific environmental requirements, including a heat rise inside the PAMS cabinet. The tested conditions from the various test programs envelop the required environmental test conditions at WBN Unit 2. Therefore, the NRC staff concludes that the environmental qualification of the Common Q PAMS meets the acceptance criteria of RG 1.209. The staff had two open items. Based on its review of the environmental qualification reports, the staff could not determine whether or not TVA had considered in the equipment testing any potential synergistic effects between temperature and humidity. This is Open Item 108 (Appendix HH). Because the staff used the criteria of RG 1.209, Open Item 102 (SSER Section 7.5.2.2.3; Appendix HH) also applies to this SSER subsection.

Open Item 108: TVA should demonstrate to the NRC staff that there are no synergistic effects between temperature and humidity for the Common Q PAMS equipment."

7.5.2.2.3.5.3 includes:

"The seismic qualification testing of the AC160/Common Q equipment was performed to both IEEE Std. 344-1975 and IEEE Std. 344-1987. However, as noted in the WBN Unit 2 Common Q PAMS SysRS, the PAMS must be seismically qualified to IEEE Std. 344-1975. The seismic testing on the AC160/Common Q equipment that was performed in accordance with IEEE Std. 344-1987 bounds the requirements specified in IEEE Std. 344-1975. Therefore, the staff concludes that all of the AC160/Common Q seismic qualification testing was performed in accordance with IEEE Std. 344-1975, and that the seismic qualification is acceptable. Open Item 96 (Appendix HH; SSER Section 7.5.2.2.3) also applies to this SSER subsection because RG 1.100, Revision 3 references IEEE Std. 344-1987."

7.5.2.2.3.7 includes:

"There is no communication between PAMS divisions. The divisions are physically separate, with no

interconnection between divisions throughout the system architecture (i.e., from the input to the displays). The communications isolation between the safety-related Common Q PAMS and the plant computer are unidirectional via the MTP software and a nonsafety-related data diode. The MTP is presumed to fail during certain postulated failures of the connected nonsafety-related equipment. These failures have been demonstrated (i.e., via data storm testing) to not affect the connected AC160 components or the OM (see Open Item 109 below; Appendix HH). Data storm testing along with the DI&C-ISG-04 compliance analysis (documented in the subsection below) provide reasonable assurance that the independence criteria (i.e., IEEE Std. 603, Clause 5.5 and IEEE Std. 7-4.3.2, Clause 5.6) are met; therefore, the Common Q PAMS communications independence is acceptable to the NRC staff."

7.5.2.2.3.7.1.8 includes:

"No data are exchanged between safety divisions in the PAMS, but data are communicated through a one-way data link to the nonsafety-related plant computer. The one-way aspects of this nonsafety-related data link are not credited because the MTP is the credited isolation device. The MTP is postulated to fail during a data storm, but this failure was demonstrated by testing not to affect the AC160 processor or the OM (i.e., to not affect the safety function). Based on the testing results, the use of the MTP in this manner is acceptable. Therefore, the WBN Unit 2 Common Q PAMS communications meet the staff position and are acceptable. The staff had one open item (Appendix HH) for followup.

* Open Item 109: TVA should demonstrate to the NRC staff acceptable data storm testing of the Common Q PAMS."

7.5.2.2.3.9 includes:

"TVA has not provided an analysis demonstrating that the criteria of IEEE Std. 603-1991 have been met (see Open Item 94, Appendix HH). However, the NRC staff performed its own analysis, as documented in the subsections below, and concluded, pending the resolution of Open Item 94, that there is reasonable assurance that the regulatory criteria in IEEE Std. 603-1991 have been met, and that the WBN Unit 2 Common Q PAMS system is acceptable."

7.5.2.2.3.9.2.6 includes:

"Each of the PAMS channels is designed to permit periodic software testing of the CET and saturation margin algorithms on demand; however, there appeared to be no description of how the RVLIS algorithm is periodically tested. This is Open Item 110 (Appendix HH).

* Open Item 110: TVA should provide information to the NRC staff describing how the WBN Unit 2 Common Q PAMS design supports periodic testing of the RVLIS function."

7.5.2.2.3.11 includes:

"TVA should confirm to the staff that there are no changes required to the technical specifications as a result of the modification installing the Common Q PAMS. If any changes to the technical specifications are required, TVA should provide the changes to the NRC staff for review. This is Open Item 111 (Appendix HH)."

7.5.2.2.3.12 includes:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.152, Revision 2 or provide justification for not conforming. As noted in SSER Section 7.5.2.2.3, this is Open Item 98 (Appendix HH)."

7.5.2.2.4 reads:

"Based on the review of the WBN Unit 2 Common Q PAMS design, as described above, the NRC staff concludes that there is reasonable assurance that the system fully conforms to the design, quality, functional and TMI-related criteria summarized above in SSER Section 7.5.2.2.2, with the open items (Appendix HH) noted in SSER Section 7.5.2.2."

7.5.2.3.4 includes:

"It is unclear to the NRC staff which software V&V documents are applicable to the HRCAR monitors. TVA should clarify which software V&V documents are applicable in order for the staff to complete its evaluation. This is Open Item 77 (Appendix HH)."

AND

"The staff asked TVA to address the radiation qualification of the HRCAR monitors. In its response dated February 25, 2011 (item number 349; ADAMS Accession No. MLI 10620219), TVA stated, in part, the following:

Calculation WBNAPS3-126 will be revised to add the control room to the calculation with a dose of less than 1 x 10E3 RAD by July 1, 2011. Since the control room TID will be documented in calculation WBNAPS3-126 to be less than 1 x 10E3 RAD, radiation qualification of the RM-1000 is not required.

This is Open Item 78 (Appendix HH) until TVA issues its revised calculation reflecting that the total integrated dose (TID) in the control room is less than 1 x 10E3 rads, and the staff completes its review.

The staff evaluated TVA's testing for EMI/RFI, as discussed in this section below with regard to compliance with RG 1.180. However, TVA specified no exclusion distances for the HRCAR monitors. TVA should perform a radiated susceptibility survey, after the installation of the hardware but before the RM-1 000 is placed in service, to establish the need for exclusion distance for the HRCAR monitors while using handheld portable devices (e.g., walkie-talkie) in the control room, as documented in Attachment 23 to TVA's letter dated February 25, 2011, and item number 355 of TVA's letter dated April 15, 2011. This is Open Item 79 (Appendix HH). The seismic qualification of the monitors is enveloped by the staff's evaluation of electrical equipment in Section 3.10 of this SSER. Pending closure of Open Items 78 and 79, the staff concludes that the HRCAR monitors have been qualified by test and analysis and meet the applicable seismic and environmental requirements. This satisfies Clause 5.4 of IEEE Std. 603-1991.

AND

"TVA should provide clarification to the staff on how TVA Standard Specification SS-E18-14.1 meets the guidance of RG 1.180 and should address any deviations from the guidance of the RG. This is Open Item 80 (Appendix HH)."

AND

"As noted above, this is Open Item 78 (Appendix HH) until TVA issues its revised calculation reflecting that the TID in the control room is less than 1 x 10E3 rads, and the staff completes its review."

AND

"As documented (item number 353) in the NRC/TVA open item master list status report dated April 8, 2011 (ADAMS Accession No. ML1 11050009), TVA stated that GA's commercial dedication program did not require multiple dedication methods in accordance with the guidance of EPRI TR-1 06439, but that GA has taken additional measures to assure quality. TA should provide information about the extent to which GA complies with EPRI TR-1 06439 and the methods that GA used for its commercial dedication process to the NRC staff for review. This is Open Item 81 (Appendix HH)."

7.5.2.3.5 reads:

"Based on its evaluation of the information provided by TVA as described above, the NRC staff concludes that the digital HRCAR monitors comply with the applicable regulatory requirements of 10 CFR 50.55a(a)(1), 10 CFR 50.55a(h), Appendix B to 10 CFR Part 50, 10 CFR 50.34(f)(2)(xix), GDC 13, GDC 19, GDC 24, GDC 64, and IEEE Std. 603-1991, and with the regulatory guidance of RG 1.97, Revision 2, RG 1.180, Revision 1, and RG 1.209. Therefore, the HRCAR monitors are acceptable, pending closure of the open items in SSER Section 7.5.2.3."

SSER23 shows the status for this item as "Open (Inspection)."

Open Item 77 (Appendix HH) reads as follows:

"It is unclear to the NRC staff which software V&V documents are applicable to the HRCAR monitors. TVA should clarify which software V&V documents are applicable, in order for the staff to complete its evaluation. (Section 7.5.2.3)

Open Item 78 (Appendix HH) reads as follows:

"TVA intends to issue a revised calculation reflecting that the TID in the control room is less than 1 x 10E3 rads, which will be evaluated by the NRC staff. (Section 7.5.2.3)"

Open Item 79 (Appendix HH) reads as follows:

"TVA should perform a radiated susceptibility survey, after the installation of the hardware but prior to the RM-1000 being placed in service, to establish the need for exclusion distance for the HRCAR monitors while using handheld portable devices (e.g., walkietalkie) in the control room, as documented in Attachment 23 to TVA's letter dated February 25, 2011, and item number 355 of TVA's letter dated April 15, 2011. (Section 7.5.2.3)"

Open Item 80 (Appendix HH) reads as follows:

"TVA should provide clarification to the staff on how TVA Standard Specification SS-E18-14.1 meets the guidance of RG 1.180, and should address any deviations from the guidance of the RG. (Section 7.5.2.3)"

Open Item 81 (Appendix HH) reads as follows:

"The extent to which TVA's supplier, General Atomics (GA), complies with EPRI TR-106439 and the methods that GA used for its commercial dedication process should be provided by TVA to the NRC staff for review. (Section 7.5.2.3)"

Open Item 94 (Appendix HH) reads as follows:

"TVA should provide to the staff either information that demonstrates that the WBN Unit 2 Common Q PAMS meets the applicable requirements in IEEE Std. 603-1991, or justification for why the Common Q PAMS should not meet those requirements. (Section 7.5.2.2.3)"

Open Item 95 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1, "Watts Bar Nuclear Plant NRC Regulatory Guide Conformance," to reference IEEE Std. 603-1991 for the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 96 (Appendix HH) reads as follows:

"TVA should (1) update FSAR Table 7.1-1 to include RG 1.100, Revision 3, for the Common Q PAMS, or (2) demonstrate that the Common Q PAMS is in conformance with RG 1.100, Revision 1, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 97 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.153, Revision 1, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 98 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.152, Revision 2, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 99 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1 to reference IEEE 7-4.3.2-2003 as being applicable to the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 100 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1 to reference RG 1.168, Revision 1; IEEE 1012-1998; and IEEE 1028-1997 as being applicable to the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 101 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS application software is in conformance with RG 1.168, Revision 1, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 102 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1 to reference RG 1.209 and IEEE Std. 323-2003 as being applicable to the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 103 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS conforms to RG 1.209 and IEEE Std. 323-2003, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 104 (Appendix HH) reads as follows:

"The NRC staff will review the WEC self assessment to verify that it the WBN Unit 2 PAMS is compliant to the V&V requirements in the SPM or that deviations from the requirements are adequately justified. (Section 7.5.2.2.3.4.2)"

Open Item 105 (Appendix HH) reads as follows:

"TVA should produce an acceptable description of how the WBN Unit 2 Common Q PAMS SysRS and SRS implement the design basis requirements of IEEE Std. 603-1991 Clause 4. (Section 7.5.2.2.3.4.3.1)"

Open Item 106 (Appendix HH) reads as follows:

"TVA should produce a final WBN Unit 2 Common Q PAMS SRS that is independently reviewed. (Section 7.5.2.2.3.4.3.1)"

Open Item 107 (Appendix HH) reads as follows:

"TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SDDs that are independently reviewed.
(Section 7.5.2.2.3.4.3.2)"

Open Item 108 (Appendix HH) reads as follows:

"TVA should demonstrate to the NRC staff that there are no synergistic effects between temperature and humidity for the Common Q PAMS equipment. (Section 7.5.2.2.3.5.2)"

Open Item 109 (Appendix HH) reads as follows:

"TVA should demonstrate to the NRC staff acceptable data storm testing of the Common Q PAMS. (Section 7.5.2.2.3.7.1.8)"

Open Item 110 (Appendix HH) reads as follows:

"TVA should provide information to the NRC staff describing how the WBN Unit 2 Common Q PAMS design supports periodic testing of the RVLIS function. (Section 7.5.2.2.3.9.2.6)"

Open Item 111 (Appendix HH) reads as follows:

"TVA should confirm to the staff that there are no changes required to the technical specifications as a result of the modification installing the Common Q PAMS. If any changes to the technical specifications are required, TVA should provide the changes to the NRC staff for review. (Section 7.5.2.2.3.11)"

REVISION 08 UPDATE:

7.5.2 of SSER25 reads:

"7.5.2 Postaccident Monitoring System

7.5.2.2 Common Qualified Platform—Postaccident Monitoring System

Disposition of Open Items (Appendix HH)

Open Item 72

Open Item 72 states, 'The NRC staff should complete its review and evaluation of the additional information provided by TVA regarding the ICC [inadequate core cooling] instrumentation.' The item was generated during the U.S. Nuclear Regulatory Commission (NRC) staff's review of the Tennessee Valley Authority's (TVA's) Watts Bar Nuclear (WBN) reactor in Section 4.4.8 of Supplemental Safety Evaluation Report (SSER) 23, issued July 2011.

The NRC staff documented its review of the Common Q postaccident monitoring system (PAMS) and ICC in Section 7.5.2.2 of SSER 23. The staff generated Open Items 94–111 (Appendix HH) during its review. Therefore, Open Item 72 is closed, because it is subsumed by Open Items 94–111.

Open Item 95

Open Item 95 states, 'TVA should update FSAR Table 7.1-1, 'Watts Bar Nuclear Plant NRC Regulatory Guide Conformance,' to reference IEEE Std. 603-1991 for the WBN Unit 2 Common Q PAMS.'

In Table 7.1-1 of Final Safety Analysis Report (FSAR) Amendment 105, dated August 12, 2011, TVA stated the following:

IEEE Std. 603-1991, 'IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,' (See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability
These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised wording in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 95 is closed.

Open Item 96

Open Item 96 states, 'TVA should (1) update FSAR Table 7.1-1 to include RG 1.100, Revision 3 for the Common Q PAMS, or (2) demonstrate that the Common Q PAMS is in conformance with RG 1.100, Revision 1, or (3) provide justification for not conforming.'

By letter dated August 4, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11222A113), TVA responded to the open item, stating that it will add Regulatory Guide (RG) 1.100, 'Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants,' Revision 3, issued September 2009, to Table 7.1-1 for Common Q PAMS. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.100, Revision 3, September 2009, 'Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants' (See Notes 13, 14, and 16).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability
These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Note 16 Conformance to Regulatory Guide 1.100, Revision 3 and IEEE 344-2004
The Common Q new design modules used in the PAMS; and the RM-1000 radiation monitors comply with IEEE 344-2004 and with Regulatory Guide 1.100 Revision 3 with the exception of issues associated with testing above 33Hz.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 96 is closed.

Open Item 97

Open Item 97 states, 'TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.153, Revision 1 or provide justification for not conforming.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item, stating that it will add RG 1.153, 'Criteria for Safety Systems,' Revision 1, issued June 1996, to FSAR Table 7.1-1 for Common Q PAMS. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.153, Revision 1, June 1996, 'Criteria for Safety Systems' (See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability

These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 97 is closed.

Open Item 99

Open Item 99 states, 'TVA should update FSAR Table 7.1-1 to reference IEEE 7-4.3.2-2003 as being applicable to the WBN Unit 2 Common Q PAMS.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this action item, stating that it would add Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 7-4.3.2, 'Application Criteria for Programmable Digital Computer Systems in Safety Systems of Nuclear Power Generating Stations,' to Table 7.1-1 for Common Q PAMS. Table 7.1-1 of FSAR Amendment 105 states the following:

IEEE Std. 7-4.3.2-2003 'Application Criteria for Programmable Digital Computer Systems in Safety Systems of Nuclear Power Generating Stations' (See Notes 13 and 18).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability

These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

...

Note 18 Conformance to IEEE 7-4.3.2-2003

The Common Q PAMS meets the applicable requirements of IEEE 7-4.3.2-2003, except as noted below:

1. The quality program is in accordance with WCAP-16096-NP-1A 'Software Program Manual' (SPM).

2. The commercial item dedication program is in accordance with the Westinghouse 10CFR50.54 Appendix B program.'

However, in its audit report dated April 27, 2011 (ADAMS Accession No. ML110980761), the NRC staff identified several examples of practices that do not comply with the software program manual, or where Westinghouse no longer followed the software program manual. The software program manual also contains criteria for commercial-grade dedication. Based on the revised wording in FSAR Amendment 105, the NRC staff concluded that TVA did not adequately address the item.

By letter dated September 30, 2011 (ADAMS Accession No. ML11286A037, Enclosure 1, Item 17), TVA stated the following:

The inclusion of Note 18 was caused by a misinterpretation of the requirements of RG 1.152 Revision 3 as it applied to IEEE 7-4.3.2 2003 by the TVA reviewer. Discussion with the NRC reviewer determined that the note was not required. Note 18 was removed in FSAR Amendment 106.

Since TVA updated the FSAR to include reference IEEE Std. 7-4.3.2-2003 as applicable to the WBN Unit 2 Common Q PAMS, Open Item 99 is closed.

Open Item 100

Open Item 100 states, 'TVA should update FSAR Table 7.1-1 to reference RG 1.168, Revision 1, IEEE Std. 1012-1998, and IEEE 1028-1997 as being applicable to the WBN Unit 2 Common Q PAMS.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item, stating that it would add RG 1.168, 'Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants,' Revision 1, issued February 2004; IEEE Std. 1012-1998, 'IEEE Standard for Software Verification and Validation'; and IEEE Std. 1028-1997, 'IEEE Standard for Software Reviews,' to Table 7.1-1 for Common Q PAMS. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.168, Revision 1, February 2004, 'Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants' (See Note 13)...IEEE Std. 1012-1998, 'IEEE Standard for Software Verification and Validation' (See Note 13). IEEE Std. 1028-1997, 'IEEE Standard for Software Reviews'(See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability

These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 100 is closed.

Open Item 102

Open Item 102 states, 'TVA should update FSAR Table 7.1-1 to reference RG 1.209 and IEEE Std. 323-2003 as being applicable to the WBN Unit 2 Common Q PAMS.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item, stating that it would add RG 1.209, 'Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants,' issued March 2007, and IEEE Std. 323-2003, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations,' to Table 7.1-1. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.209, Revision 0, March 2007, 'Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants' (See Note 13)...IEEE Std. 323-2003, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations,' (See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability,

These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 102 is closed.

Open Item 103

Open Item 103 states, 'TVA should demonstrate that the WBN Unit 2 Common Q PAMS conforms to RG 1.209 and IEEE Std. 323-2003 or provide justification for not conforming.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item; Attachment 3 to the letter included the requested evaluation.

Based on its review of the information submitted by TVA, the staff concluded that TVA provided an adequate evaluation of conformance with RG 1.209 and IEEE Std. 323-2003. herefore, Open Item 103 is closed.

Open Item 104

Open Item 104 states, 'The NRC staff will review the WEC [Westinghouse Electric Corporation] self-assessment to verify that the WBN Unit 2 PAMS complies with the V&V [verification and validation] requirements in the SPM or that deviations from the requirements are adequately justified.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA provided information to address this item (see letter item 15, 'NRC Common Q PAMS Audit Action Items Response'). The information provided and the information subsequently reviewed demonstrate that Westinghouse did not consistently follow the software program manual and that Westinghouse did not plan and document these deviations beforehand; however, TVA did provide sufficient information to allow the NRC staff to determine, with reasonable assurance, that the Common Q PAMS does not pose a threat to public health and safety. Therefore, Open Item 104 is closed.

Open Item 106

Open Item 106 states, 'TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SRS [system requirements specification] is independently reviewed.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA responded to 'NRC Request (Item Number 372),' documenting why it concluded that the reviews were independent. The information provided was essentially an affirmation that the documents were independently reviewed. The Westinghouse internal guidance (reviewed during the NRC audit documented at ADAMS Accession No. ML110980761) is inconsistent on how to document that a review was an 'independent review - satisfying Appendix B' versus a more informal review. However, the NRC staff considers that the affirmation provided by TVA in its letter dated June 10, 2011, is sufficient; therefore, Open Item 106 is closed.

Open Item 107

Open Item 107 states, 'TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SDDs [software design documents] are independently reviewed.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA responded to 'NRC Request (Item Number 373),' documenting why it concluded that the reviews were independent. The information provided was essentially an affirmation that the documents were independently reviewed. The Westinghouse internal guidance (reviewed during the NRC audit documented at ADAMS Accession No. ML110980761) is inconsistent on how to document that a review was an 'independent review - satisfying Appendix B' versus a more informal review. However, the NRC staff considers the affirmation provided by TVA in its letter dated June 10, 2011, to be sufficient; therefore, Open Item 107 is closed.

Open Item 109

Open Item 109 states, 'TVA should demonstrate to the NRC staff acceptable data storm testing of the Common Q PAMS.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA responded to '18. NRC Verbal Request,' which stated the following:

Watts Bar Unit 2 Post Accident Monitoring System went through a Data Storm Test to verify that the safety related functions of the system driven by the Advant Controller 160 (AC 160) and the safety related indications monitored on the Operator Module (OM) located in the Main Control Room (MCR) are not affected when the Ethernet network interface of the Maintenance and Test Panel (MTP) is under data storm conditions. This test was requested by TVA.

The purpose of the data storm test was to test the ability of the MTP to handle the possible volume of traffic generated by a broadcast storm without impacting the safety functions. A broadcast storm occurs when a large number of broadcast packets are received. Forwarding these packets can cause the network to slow down or to time out.

Another objective of the data storm test was to test the ability of the MTP to handle malformed packets possibly generated by a data storm without impacting the safety functions.

TVA also described the pass/fail criteria and associated results. The PAMS continued to perform its safety function during the data storm testing, as demonstrated by its meeting the acceptance criteria.

Based on its review of the information provided by TVA, the NRC staff concludes that the open item was acceptably addressed. Therefore, Open Item 109 is closed.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			7.5.2.2.3.9.2.5 IEEE Std. 603-1991, Clause 5.6, Independence In Section 7.5.2.2.3.9.2.5 of SSER 23, issued July 2011, the NRC staff concluded that the Common Q PAMS meets the acceptance criteria for independence and the requirements of Clause 5.6; therefore, the PAMS is acceptable. Core exit thermocouples (CETs) are bundled together with the non-Class 1E self-powered neutron detectors in the mineral insulated cable and thus do not meet the separation requirements between safety- and nonsafety-related equipment in IEEE Std. 384-1981, 'IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits.' The NRC staff documented its separation/isolation evaluation for the CETs in Section 7.7.1.9 of SSER 24, issued September 2011. 7.5.2.3 High-Range Containment Area Radiation Monitors Disposition of Open Items (Appendix HH) Open Item 78 ---------- Open Item 78 states, 'TVA intends to issue a revised calculation reflecting that the TID [total integrated dose] in the control room is less than 1×103 rads, which will be evaluated by the NRC staff.' TVA's letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), responded to the open item, and Enclosure 1 to the letter provided TVA's supporting calculation (Calculation No. WBNAPS3-127, Revision 0). TVA stated that the TID for the main control room, where the radiation monitors are located, is 362.76 rads. This radiation dose is acceptable to the NRC staff for mild environments according to the guidance in RG 1.209. Based on its review of the information provided in TVA's letter dated August 4, 2011, and the calculation summary, the staff concluded that TVA provided an adequate response. Therefore, Open Item 78 is closed." SSER25 shows the status for this item as "Open (Inspection)."
7.5.3	23	CI --- 07	B 79-27, "Loss of Non-class 1E I&C Power System Bus During Operation" – TVA responded to the Bulletin on March 1, 1982. Reviewed in 7.5.3 of the original 1982 SER. Unit 2 Action: Issue appropriate emergency procedures. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). ---------- ---------- REVISION 07 UPDATE: 7.5.3 of SSER23 includes: "By letter dated October 21, 2010 (letter open item 315; ADAMS Accession No. ML103140661), TVA responded that While the WBN Unit 2 Emergency Operating Procedures (EOPs) have not been written, they will be written the same as the Unit 1 EOPs. WBN Unit 1 personnel will perform validations to ensure that WBN Unit 2 EOPs will perform the required actions. The WBN Unit 2 EOPs will be written and validated prior to Unit 2 fuel load. TVA's response is acceptable to the staff, because it will assure that the WBN Unit 2 procedures are the same as those for WBN Unit 1. The NRC staff will inspect to confirm that TVA has completed the WBN Unit 2 EOPs before fuel load. This is Open Item 73 (Appendix HH).

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Based on its previous evaluation, as documented in the SER, and on its evaluation of the information provided by TVA in its letter dated October 21, 2010, the NRC staff concludes that TVA's response to IE Bulletin 79-27 is acceptable." SSER23 shows the status for this item as "Open (Inspection)." ---------- Open Item 73 (Appendix HH) reads as follows: "The NRC staff will inspect to confirm that TVA has completed the WBN Unit 2 EOPs prior to fuel load. (Section 7.5.3)"
7.5.4	21	CI --- 02	"CONCLUSIONS" left CI until all items in subsection are closed. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection).
7.6.0	0	C ---	Approved for both units in SER.
7.6.1	24	C --- 07	Approved for both units in SER. ---------- ---------- REVISION 07 UPDATE: 7.6.1.5 (Conclusion) of SSER23 reads: "Based on its evaluation as described above, the NRC staff concludes that the new digital LPMS at WBN Unit 2 complies with the applicable requirements of 10 CFR 50.55a(a)(1), 10 CFR 50.55a(h), and GDC 13 and meets the guidance of SRP BTP 7-19, Revision 5, RG 1.133, Revision 1, and DI&C-ISG-02, Revision 2." SSER23 shows the status for this item as "Resolved." ---------- 7.6.1 of SSER24 includes: "Based on its review of the information provided by TVA in letters dated May 6 and June 10, 2011, the NRC staff concludes that the LPMS meets the guidelines of RG 1.133, Revision 1. Therefore, Open Item 82 is closed." SSER24 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.6.2	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 7.6.2 of SSER23 includes: "The NRC staff reviewed WBN Unit 2 FSAR Amendment 96 and concluded that TVA's changes to FSAR Section 7.6.2 were either editorial or administrative in nature and did not change the design of the system. Therefore, based on its previous evaluation as documented in the SER and its review of the changes made in FSAR Amendment 96, the NRC staff concludes that the information provided in WBN Unit 2 FSAR Section 7.6.2 meets the relevant guidance of the SRP, and that the staff's conclusion in the SER remains valid." SSER23 shows the status for this item as "Resolved."
7.6.3	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 7.6.3 of SSER23 reads: "The NRC staff reviewed the WBN upper head injection system manual control system in SER Section 7.6.3 and concluded that it was acceptable. By FSAR Amendment 63, dated June 26, 1990, TVA removed the system to increase operational flexibility and also deleted the description of the system from the FSAR. The staff reviewed TVA's justification for the removal of the system and concluded that it was acceptable, as documented in Section 6.3.1.1 of SSER 7. The staff's conclusion in SSER 7 remains valid, and no further review of the system is required." SSER23 shows the status for this item as "Resolved."
7.6.4	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 7.6.4 of SSER23 includes: "The remainder of TVA's changes in FSAR Amendment 96 were editorial, administrative, or for clarification. Therefore, based on its previous evaluation as documented in the SER, and on its evaluation of the information provided by TVA as documented above, the staff concludes that TVA's design to protect against the spurious actuation of motor-operated valves, as discussed in WBN Unit 2 FSAR Section 7.6.6, meets the guidance in the SRP." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.6.5	23	C --- 07	CONFIRMATORY ISSUE - install switches on the main control board for the operator to manually arm this system (overpressure protection provided by pressurizer PORVs) In the original 1982 SER, the staff found the design of the overpressure protection during low temperature features acceptable pending review of the drawings and FSAR description. In SSER4, the staff documented completion of the review and closed the confirmatory issue. REVISION 07 UPDATE: 7.6.5 of SSER23 includes: "Based on its previous evaluation, as documented in the SER and SSER 4, and its review of the information provided by TVA in FSAR Amendments 96 and 101 and by letter dated November 24, 2010, the NRC staff concludes that TVA's interlock system continues to meet the guidance provided in the SRP and BTP RSB 5-2." SSER23 shows the status for this item as "Resolved."
7.6.6	23	C --- 07	Approved for both units in SER. REVISION 07 UPDATE: 7.6.6 of SSER23 includes: "Based on its previous evaluation, as documented in the SER and SSER 5, and on its review of the information provided by TVA in its letter dated March 31, 2010, the NRC staff concludes that TVA's approach meets the guidance provided in the SRP and BTP ICSB-18 (PSB)." SSER23 shows the status for this item as "Resolved."
7.6.7	23	C --- 07	Approved for both units in SER. REVISION 07 UPDATE: 7.6.7 of SSER23 includes: "Therefore, based on its previous evaluation as documented in the SER, and on its evaluation of the information provided by TVA in FSAR Amendment 96 and the letter dated September 9, 2010, the NRC staff concludes that TVA's design for the cold-leg accumulator valve interlock and position indication meets the guidance provided in the SRP and, therefore, is acceptable." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.6.8	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 7.6.8 of SSER23 includes: "Based on its previous evaluation, as documented in SER Section 7.6.8, and on its evaluation of the information provided by TVA in its letter dated October 21, 2010, the staff concludes that TVA's interlock system for automatic switchover from injection to recirculation mode meets the guidance provided in the SRP." SSER23 shows the status for this item as "Resolved."
7.6.9	4	C	Approved for both units SER subject to completion of Confirmatory Issue in 7.6.5.
7.7.0	0	C	Approved for both units in SER.
7.7.1	25	O 08	Approved for both units in SER. REVISION 07 UPDATE : [portions from SSER23] 7.7.1.4.4.1 includes: "One aspect of the analysis that has not yet been confirmed by TVA is the ability of the network to sustain a data storm event without experiencing a plant upset, as necessary to verify compliance with Clause 6.3 of IEEE Std. 603-1991. In Enclosure 2 of its letter dated August 11, 2010 (ADAMS Accession No. ML102240384), TVA stated the following: A network data storm test will be performed with the system installed and prior to final commissioning. The test will confirm that the system will continue to function with a failed communication network without any plant upset. TVA should confirm to the NRC staff the completion of the data storm test on the DCS. This is Open Item 83 (Appendix HH)." --- 7.7.1.4.5 (Conclusion) reads: The NRC staff reviewed the WBN Unit 2 DCS as described in FSAR Amendments 96 through 103. Based on its review, the staff concludes that the information provided in FSAR Section 7.7.1.11 meets the relevant regulatory requirements identified in SRP Section 7.7, Revision 5, including 10 CFR 50.55a(a)(1), GDC 1, and GDC 13. The staff also concludes that TVA's analysis shows that the new DCS is consistent with Clause 6.3 of IEEE Std. 603-1991 and does not introduce any new failures, or change the probability or consequences of existing failures, not already addressed in the FSAR safety analyses. Additional evaluation by the NRC staff regarding conformance with Clause 5.6.3 of IEEE Std. 603-1991 and GDC 24 is contained in Section 7.9 of this SSER. SSER23 shows the status for this item as "Open (NRR)."

* = See last page for status code definition.

Open Item 83 (Appendix HH) reads as follows:

"TVA should confirm to the NRC staff the completion of the data storm test on the DCS. (Section 7.7.1.4)"

[portions from SSER24]

7.7.1.9.2 includes:

"The WINCISE system uses Optimized Proportional Axis Region Signal Separation Extended Life (OPARSSEL™) IITAs, containing five vanadium SPNDs and one CET. The individual vanadium emitter generates a signal proportional to the neutron flux activation at its specific location. Within an IITA, each vanadium emitter has a different length to allow the IITA to measure the axial power distribution in five segments (i.e., each segment of detector has a different length that permits measurement of a different axial core segment). If an individual SPND were to fail, the BEACON system will continue to perform, but with a decreased axial resolution of the core power measurement within the assembly. The other vanadium detectors within the IITA would still be deemed operable. TVA should provide to the NRC staff a description of how the other vanadium detectors within the IITA would be operable following the failure of an SPND. This is Open Item 118 (Appendix HH). The extension member for each detector within the IITA ensures that all five vanadium detectors and the CET have an appropriate length to correctly locate them within the IITA."

7.7.1.9.5 includes:

"Westinghouse document WNA-DS-01811-WBT, Revision 0, 'WINCISE Signal Processing System Design Requirements,' which the NRC staff reviewed during audits conducted on June 28–29 and July 15, 2011, at the Westinghouse Electric Corporation office in Rockville, MD (audit report at ADAMS Accession No. ML112092667; not publicly available), required a power supply of 120 volts alternating current (VAC) ±10 percent for the SPS cabinet. Based on this requirement, Westinghouse determined the maximum overvoltage or surge voltage to be 264 VAC based on the information provided for the Quint power supplies to be installed in the SPS cabinet, as well as taking into account the maximum supply voltage of 220 VAC, even though the 120-VAC, Class 1E bus feeding the SPS cabinet is employed. The NRC staff evaluated the Westinghouse analysis performed to demonstrate how the SPS design meets the isolation requirements. Calculation Note WNA-CN-00157-WBT, Revision 0, 'Watts Bar 2 Incore Instrumentation System Signal Processing System Isolation Requirements,' summarizes this analysis. The NRC staff reviewed this calculation note during audits conducted on June 28–29 and July 15, 2011, at the Westinghouse Electric Corporation office in Rockville, MD (audit report at ADAMS Accession No. ML112092667; not publicly available). TVA should submit WNA-CN-00157-WBT to the NRC by letter to establish the record of the NRC staff's basis and its conclusions. This is Open Item 119 (Appendix HH).

The analysis showed that a surge voltage or overvoltage could originate from the SPS cabinet power supply, the 120-VAC, Class 1E power supply bus, ethernet communication, or cable voltage buildup. The analysis stated that the maximum overvoltage or surge voltage that could affect the system was 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC. TVA should confirm to the NRC staff that the maximum overvoltage or surge voltage that could affect the system is 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC. This is Open Item 120 (Appendix HH).

The analysis assumed that testing was performed for the IITA assembly, and the MI cable could withstand an overvoltage or surge voltage not greater than 600 volts direct current (Vdc). The analysis showed that no credible source of faulting can negatively impact the CETs or PAMS train. The NRC staff should confirm by review of WNA-CN-00157-WBT, Revision 0, that no credible source of faulting can negatively impact the CETs or PAMS train. Open Item 119 (Appendix HH) includes this issue.

As mentioned above, WNA-CN-00157-WBT, Revision 0, requires that the IITA assemblies and MI cable be tested for overvoltage and surge voltage of up to 600 Vdc.. In a letter from R.W. Morris to D. Menard (LTR-ME-10-3, 'Watts Bar 2 Incore Instrumentation System Dielectric Characteristics of Completed MI

Cable Assemblies,' dated January 11, 2010), which the NRC staff reviewed during audits conducted on June 28–29 and July 15, 2011, at the Westinghouse Electric Corporation office in Rockville, MD (audit report at ADAMS Accession No. ML112092667; not publicly available), Westinghouse summarized the evaluation performed to determine whether the MI cable could withstand an overvoltage and surge voltage of up to 600 Vdc. The NRC staff reviewed LTR-ME-10-3 and confirmed that all 58 1-to-2 transition cable assemblies were subjected to and successfully passed a 600-Vdc dielectric strength test. Since Westinghouse has only tested the MI cable, the same evaluation should be performed for the IITA assembly. This is Open Item 121 (Appendix HH), pending TVA submittal of the test results for the IITA assembly for NRC staff review.

Assuming satisfactory completion of the open items described above, the NRC staff concludes that the TVA analysis of the maximum credible overvoltage or surge voltage that can propagate from the non-Class 1E power supplies in the SPS cabinets to the SPND input signals is adequate. TVA also demonstrated that the MI cable and the IITA assembly can withstand overvoltage and surge voltage equal to 600 Vdc. Thus, the MI cable design allows for the isolation of the Class 1E CETs and non-Class 1E SPND signals. This hardware analysis requirement satisfies the requirements for testing or analysis of associated circuit interaction with Class 1E circuits contained in IEEE Std. 384-1981 for overvoltage conditions.

To further mitigate the possibility of a transient surge voltage condition in the SPS cabinet's input power supply in excess of the identified maximum overvoltage value that might disable both divisions of the CET signals used by the PAMS, different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. Specifically, the power supply routed to PAMS train A is the same as that routed to SPS cabinet 1, and the power supply routed to PAMS train B is the same as that routed to SPS cabinet 2. TVA should confirm to the NRC staff that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. This is Open Item 122 (Appendix HH)."

AND

"Further, after the seal table, the MI cable configuration is a Y split, and the SPND signals are routed to SPS cabinets 1 and 2. The Y split separates the Class 1E CET signal from the associated SPND cabling. The SPS cabinet digitizes the SPND signal. The system performs periodic automatic diagnostic testing to confirm SPND signal quality. One of these tests is a leakage resistance determination. If the SPND does not pass this test, the system will assign a data quality value to notify the power distribution calculation software to disregard data from this SPND. TVA should explain to the NRC staff how the system will assign a data quality value to notify the power distribution calculation software to disregard data from a failed SPND. This is Open Item 123 (Appendix HH).

The digitized SPND signal is then transferred to the WINCISE application servers, integrated computer system (ICS), and BEACON. The SPS transfers digitized SPND signals to the BEACON ovation data highway, where the BEACON datalink collects the data. The ICS provides plant conditions for the BEACON to use in calculating core power distribution. The WINCISE nonsafety-related internet protocol switches provide the main hub for traffic flow from the SPS cabinets, BEACON servers, WINCISE application servers, and the ICS. In its letter dated April 15, 2011 (ADAMS Accession No. ML11136A053), TVA explained that transmission of information from BEACON or SPS cabinets to the ICS is only done via the WINCISE application servers. While the BEACON datalink on the application server can connect to either BEACON machine, only BEACON A is used for communication. TVA should clarify to the NRC staff whether automatic switchover to the other server is permitted. This is Open Item 124 (Appendix HH)."

AND

"Equipment Qualification

The WINCISE is a nonsafety-related system; only the IITA assembly and the MI cable are safety related. The SPND signals are considered quality related, and the CETs are safety related. Because these signals are bundled together in the IITA, as previously described, all MI cables and IITA connectors provided are environmentally qualified and Class 1E qualified. TVA should clarify to the NRC staff the type of connector used with the MI cable in WBN Unit 2 and which environmental qualification test is applicable. This is Open Item 125 (Appendix HH). To enable the NRC staff to evaluate and review the IITA environmental qualification, TVA should also provide the summary report of the environmental qualification for the IITA. This is Open Item 126 (Appendix HH).

In Attachment 8 to its letter dated May 6, 2011 (ADAMS Accession No. ML11129A205), TVA submitted the Westinghouse report, DAR-ME-09-10, Revision 0, 'Qualification Summary Report for the WINCISE Cable and Connector Upgrade at Watts Bar Unit 2.' This report summarizes the environmental and seismic/structural qualification of the MI cable, in accordance with IEEE Std. 323-1974, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations,' and IEEE Std. 344-1975, 'IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations,' including NUREG-0588, Revision 1, 'Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment.' This report identifies similarity analysis as the method of qualification. The report shows that the tested MI cable fulfilled the electrical operability acceptance criteria throughout all phases of testing and met the specified WBN Unit 2 environmental parameters and inputs. In addition, the MI cable is qualified for the Class 1E application. TVA should provide a summary to the NRC staff of the electromagnetic interference/radiofrequency interference testing for the MI cable electromagnetic compatibility (EMC) qualification test results. This is Open Item 127 (Appendix HH).

The thermocouple cables, connectors, and cables outside the containment are part of the Westinghouse Common Q PAMS cabinet qualification. Section 7.5.2.2 of SSER 23 discusses this qualification.

As previously described, the SPS cabinets are used for conditioning and processing of low-current signals from in-containment neutron flux monitors. The SPS cabinets do not perform any direct Class 1E function and are classified as non-Class 1E. However, because the SPS cabinets are being installed in the reactor building (a seismic Category I structure), the SPS must be qualified in accordance with RG 1.100, Revision 3, 'Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants,' issued September 2009;, IEEE Std. 344-1975; and IEEE Std. 344-1987, 'IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations.' Specifically, the SPS cabinet must be able to withstand the effects of five operational basis earthquakes and one safe-shutdown earthquake without the loss of physical integrity or creation of missile hazards. The NRC staff reviewed the summary description provided in Attachment 5 of TVA's letter dated June 10, 2011 (ADAMS Accession No. ML11167A110). TVA stated that the cabinet maintained structural integrity without any component detachment throughout the test program and thus complies with the WBN Unit 2 seismic qualification specification, WB-DC-40-31.2, Revision 8, 'Watts Bar Nuclear Plant Seismic Qualification of Category 1 Fluid System Components and Electrical or Mechanical Equipment,' with testing performed in accordance with RG 1.100, IEEE Std. 344-1975, and IEEE Std. 344-1987. TVA should submit the seismic qualification test report procedures and results for the SPS cabinets to the NRC staff for review. This is Open Item 128 (Appendix HH)."

AND

"Specifically, WNA-CN-00157-WBT requires the analysis to demonstrate that surge events up to 4 kilovolts (kV) on the WINCISE SPS alternating current (ac) power feed into the cabinet could not propagate through the cabinet. Westinghouse performed an analysis to evaluate this fault. WNA-CN-00157-WBT, Revision 0, summarizes the results of the Westinghouse analysis. This analysis demonstrated that no credible source of faulting of a 600-Vdc limit can negatively affect the PAMS. This analysis identified a Westinghouse open item requiring the Quint power supply (to be installed in the SPS cabinet) to undergo EMC testing of 4 kV to validate the assumptions made in the Westinghouse analysis. TVA should verify to the NRC staff resolution of the open item in WNA-CN-00157-WBT, which requires the Quint power supply (to be installed in the SPS cabinet) to undergo EMC testing of 4 kV to validate the assumptions made in the Westinghouse analysis. This is Open Item 129 (Appendix HH). For additional information about the Westinghouse analysis, refer to the evaluation of IEEE Std. 384 described above in this SSER section entitled "Separation/Isolation Evaluation."

The acceptance criteria for the surge tests require that the 24-Vdc cabinet electronics do not suffer damage during surge events. As long as this requirement is maintained, any surge propagation into the cabinet will remain far less than the 600-Vdc limit. In Attachment 5 of its letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA provided a summary of the environmental qualification. This summary states that the SPS cabinet successfully complied with the emissions requirements of RG 1.180, Revision 1, "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems," issued October 2003. TVA should provide a summary to the NRC staff of the EMC qualification test results of the SPS cabinets. This is Open Item 130 (Appendix HH)."

AND

"RG 1.97 identifies the necessary range of the CETs as 200 to 2,300 degrees F, which is the same range described in the WBN Unit 2 FSAR. However, as described previously, because of the new CET location and IITA configuration, the CETs in WBN Unit 2 can differ from the CETs in WBN Unit 1 by up to 15 degrees F under certain accident scenarios. In its letter dated June 23, 2011, TVA explained that, during accident conditions in which the reactor coolant pumps are operating, the water mixing and travelling through the fuel element channels in which the IITA guides (and thus the CETs) are located will cause the temperature seen by WBN Unit 2 to be lower than the temperature indicated for WBN Unit 1. The emergency operating procedure (EOP) for WBN Unit 2 should consider this difference in temperature. As a result, TVA should review the EOP action level setpoint to account for this difference between core exit temperature readings for WBN Unit 1 and Unit 2 and confirm the EOP action level setpoint to the NRC staff. This is Open Item 131 (Appendix HH)."

7.7.1.9.6 (Conclusion) reads:

"Based on the above, the NRC staff concludes that the IIS complies with the acceptance criteria of SRP Section 7.7, Revision 5; BTP 7-19, Revision 5; RG 1.97, Revision 2; and RG 1.75, Revision 2, and therefore meets the requirements of 10 CFR 50.55a(a)(1), 10 CFR 50.55a(h), GDC 13, and GDC 24. Therefore, the WBN Unit 2 IIS is acceptable."

7.7.1 ends with:

"Conclusion

Based on its review of the information provided by TVA, as described above, the NRC staff concluded that TVA adequately addressed the aging degradation of the materials used in the IITAs. Since aging degradation due to wear does not occur in IITAs, and any breach of the IITAs does not result in loss of RCS pressure boundary, the NRC staff concludes that the IITAs do not require routine inspections under TVA's plant maintenance program. Therefore, the NRC staff concludes that TVA has adequately addressed the issue of aging degradation of the materials used in IITAs in the WINCISE system and meets the requirements of GDC 10."

SSER24 shows the status for this item as "Open (NRR)."

Open Item 118 (Appendix HH) reads as follows:

"TVA should provide to the NRC staff a description of how the other vanadium detectors within the IITA would be operable following the failure of an SPND. (SSER 24, Section 7.7.1.9.2)"

Open Item 119 (Appendix HH) reads as follows:

"TVA should submit WNA-CN-00157-WBT, Revision 0, to the NRC by letter. The NRC staff should confirm by review of WNA-CN-00157-WBT, Revision 0, that no credible source of faulting can negatively impact the CETs or PAMS train. (SSER 24, Section 7.7.1.9.5)"

Open Item 120 (Appendix HH) reads as follows:

"TVA should confirm to the NRC staff that the maximum over-voltage or surge voltage that could affect the system is 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC. (SSER 24, Section 7.7.1.9.5)"

Open Item 121 (Appendix HH) reads as follows:

"TVA should submit the results to the NRC staff of a 600 VDC dielectric strength test performed on the

IITA assembly. (SSER 24, Section 7.7.1.9.5)"

Open Item 122 (Appendix HH) reads as follows:

"TVA should confirm to the NRC staff that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. (SSER 24, Section 7.7.1.9.5)"

Open Item 123 (Appendix HH) reads as follows:

"TVA should provide an explanation to the NRC staff of how the system will assign a data quality value to notify the power distribution calculation software to disregard data from a failed SPND. (SSER 24, Section 7.7.1.9.5)"

Open Item 124 (Appendix HH) reads as follows:

"While the BEACON datalink on the Application server can connect to either BEACON machine, only BEACON A is used for communication. TVA should clarify to the NRC staff whether automatic switchover to the other server is not permitted. (SSER 24, Section 7.7.1.9.5)"

Open Item 125 (Appendix HH) reads as follows:

"TVA should provide clarification to the NRC staff of the type of connector used with the MI cable in Unit 2, and which EQ test is applicable. (SSER 24, Section 7.7.1.9.5)"

Open Item 126 (Appendix HH) reads as follows:

"To enable the NRC staff to evaluate and review the IITA environmental qualification, TVA should provide the summary report of the environmental qualification for the IITA. (SSER 24, Section 7.7.1.9.5)"

Open Item 127 (Appendix HH) reads as follows:

"TVA should provide a summary to the NRC staff of the electro-magnetic interference/radio-frequency interference (EMI/RFI) testing for the MI cable electro-magnetic compatibility (EMC) qualification test results. (SSER 24, Section 7.7.1.9.5)"

Open Item 128 (Appendix HH) reads as follows:

"TVA should submit the seismic qualification test report procedures and results for the SPS cabinets to the NRC staff for review. (SSER 24, Section 7.7.1.9.5)"

Open Item 129 (Appendix HH) reads as follows:

"TVA should verify to the NRC staff resolution of the open item in WNA-CN-00157-WBT for the Quint power supply (to be installed in the SPS cabinet) to undergo EMC testing of 4 kV to validate the assumptions made in the Westinghouse analysis. (SSER 24, Section 7.7.1.9.5)"

Open Item 130 (Appendix HH) reads as follows:

"TVA should provide a summary to the NRC staff of the EMC qualification test results of the SPS cabinets. (SSER 24, Section 7.7.1.9.5)"

Open Item 131 (Appendix HH) reads as follows:

"TVA should review the EOP action level setpoint to account for the difference between core exit temperature readings for Unit 1 and Unit 2 and confirm the EOP action level setpoint to the NRC staff. (SSER 24, Section 7.7.1.9.5)"

REVISION 08 UPDATE:

7.7.1.9 of SSER25 reads:

"7.7.1.9 In-Core Instrumentation System

Disposition of Open Items (Appendix HH)

Open Item 119

Open Item 119 states, 'TVA should submit WNA-CN-00157-WBT, Revision 0, to the NRC by letter. The NRC staff should confirm by review of WNA-CN-00157-WBT, Revision 0, that no credible source of faulting can negatively impact the CETs or PAMS train.'

In Enclosure 1 and in Attachment 2 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA responded to this open item. Attachment 2 included a copy of Westinghouse analysis WNA-CN-00157-WBT, Revision 0, 'Watts Bar 2 Incore Instrument System (IIS) Signal Processing System (SPS) Isolation Requirements.' The analysis shows the following:

1. No fault originating either within the WINCISE (Westinghouse INCore Information, Surveillance, and Engineering system) signal processing system (SPS) cabinet or electrical surges on the input power lines or output communications link can result in fault voltage affecting CET signals.

2. Inadvertent disconnection or failures of any IITA (in-core instrumentation thimble assembly) emitter wire or wires at the WINCISE SPS cabinet, or anywhere in the cabling between the IITA seal table connector and the WINCISE SPS cabinet, will not cause voltage charge-up on the emitter wire to exceed 600 volts direct current during worst case (full-power) plant operation, thus preventing the fault voltage from affecting the associated CET.

3. For large input overvoltage conditions on the 120-volt alternating current (Vac) input instrument bus used in both the SPS cabinet and associated PAMS train, the SPS will not cause any failure within the PAMS train that would not otherwise occur as a direct result of the overvoltage condition within the PAMS power supply.

The impact of a failed CET on a PAMS channel is addressed in Westinghouse analysis WNA-AR-00180-WBT-P, Revision 2, 'Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System,' page 3-6, in TVA's letter dated March 2, 2011 (ADAMS Accession No. ML110620411).

Based on the analysis results, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 119 is closed.

Open Item 120

Open Item 120 states, 'TVA should confirm to the NRC staff that the maximum over-voltage or surge

voltage that could affect the system is 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC.'

In Enclosure 1 and in Attachments 2 and 5 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA responded to this open item. The information provided by TVA confirms that 264 Vac is the estimated maximum voltage, or surge-voltage, that could affect WINCISE. Furthermore, the equipment qualification for the WINCISE SPS, provided in Attachment 5, shows that the SPS cabinets can withstand a maximum surge of 4,000 volts with no loss of function after the surge.
However, TVA's response did not confirm that the power supply cable to the WINCISE SPS cabinet would not be routed with other cables carrying greater than 264 Vac. TVA must confirm that the power supply cable to the SPS cabinet is not routed with other cables with voltage greater than 264 Vac. Open Item 120 remains open.

Open Item 122

Open Item 122 states, 'TVA should confirm to the NRC staff that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits.'

In Enclosure 1 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA confirmed that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. Therefore, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 122 is closed.

Open Item 124

Open Item 124 states, 'While the BEACON datalink on the Application server can connect to either BEACON machine, only BEACON A is used for communication. TVA should clarify to the NRC staff whether automatic switchover to the other server is not permitted.'

In Enclosure 1 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA explained that the feature to automatically switch over to BEACON B is not configured for WBN Unit 2, and the BEACON datalink on the application server can only connect to BEACON A. TVA provided further information in Attachment 3 to its letter dated June 10, 2011 (ADAMS Accession No. ML11167A110). The NRC staff reviewed the information provided in TVA's letters dated June 10 and September 1, 2011, and concluded that its response was acceptable. Therefore, Open Item 124 is closed.

Open Item 128

Open Item 128 states, 'TVA should submit the seismic qualification test report procedures and results for the SPS cabinets to the NRC staff for review.'

In Enclosure 1 and in Attachment 5 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA responded to this open item. Attachment 5 includes a copy of the Westinghouse report EQ-QR-39-WBT, Revision 0, 'Equipment Qualification Summary Report for WINCISE Signal Processing System.' This summary report describes the seismic qualification test performed and the results obtained. The WINCISE SPS cabinet maintained structural integrity without any component detachment throughout the test program and thus complied with WBN Unit 2 seismic qualification specification WB-DC-40-31.2, with testing performed in accordance with NRC RG 1.100, IEEE Std. 344-1975, and IEEE Std. 344-1987, 'IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations.' Based on the information in the summary report, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 128 is closed.

Open Item 130

Open Item 130 states, 'TVA should provide a summary to the NRC staff of the EMC [electromagnetic compatibility] qualification test results of the SPS cabinets.'

In Enclosure 1 and in Attachment 5 to its letter dated September 1, 2011 (ADAMS Accession No.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			ML11257A048), TVA responded to this open item. Attachment 5 includes a copy of the Westinghouse report EQ-QR-39-WBT, Revision 0, 'Equipment Qualification Summary Report for WINCISE Signal Processing System.' This summary report describes the EMC qualification test performed and the results obtained. The report states that the WINCISE SPS cabinet successfully complied with the emissions requirements of NRC RG 1.180, Revision 1, 'Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems,' and the supplemental-surge-withstand testing required in WNA-CN-00157-WBT. Therefore, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 130 is closed." SSER25 shows the status for this item as "Open (NRR)."
7.7.2	23	C 07	LICENSE CONDITION – Status monitoring system, Bypassed and Inoperable Status Indication (BISI) In the original 1982 SER, the staff requested TVA address RG 1.47, "Bypassed and Inoperable Status Indications for Nuclear Power Plant Safety Systems." TVA addressed RG 1.47 by letters for both units dated January 29, 1987, and October 22, 1990. In SSER7, the staff documented completion of the review and closed the issue. By letter dated February 18, 1994, for both units, TVA submitted a re-evaluation of BISI that excluded components that would not be rendered inoperable more than once a year in accordance with RG 1.47 position C.3(b). In SSER13, NRC reviewed the revision and concluded that it was acceptable. REVISION 07 UPDATE: 7.7.2 of SSER23 reads: "In Section 7.7.2 of the SER, and in SSER 7 and SSER 13, the NRC staff evaluated WBN FSAR Section 7.7.1.3.6, 'Safety System Status Monitoring System.' TVA restructured the WBN Unit 2 FSAR in Amendment 96, such that Section 7.7.1.3.6 now references Section 7.5, which provides a description of the BISIS system in FSAR Section 7.5.2.2. The NRC staff's evaluation of the WBN Unit 2 BISI is in Section 7.5.1.1.2 of this SSER." SSER23 shows the status for this item as "Resolved."
7.7.3	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 7.7.3 of SSER23 includes: "Based on the NRC staff's review of WBN Unit 2 FSAR Amendments 92 through 103, the staff concludes that there were no substantive changes to the information provided by TVA in FSAR Section 9.3.4.2.1.C(1), and that the staff's conclusions in the SER remain valid." SSER23 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.7.4	23	C	Approved for both units in SER.
		07	REVISION 07 UPDATE: 7.7.4.4 (Conclusion) of SSER23 reads: "The NRC staff reviewed the pressurizer water level controls and the steam generator water level controls to prevent vessel overfill conditions provided by TVA in WBN Unit 2 FSAR Amendments 96 through 103 and in TVA's letter dated October 29, 2010. The staff verified that these systems are functionally the same as those of WBN Unit 1, which was previously reviewed and accepted by the staff, as documented in the SER. Based on the NRC staffs prior evaluation in the SER and the similarity of the WBN Unit 1 and Unit 2 systems, the staff concludes that the information provided in WBN Unit 2 FSAR Sections 7.7.1.6 and 7.7.1.7 is acceptable and that the staff's conclusions in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.7.5	23	C	Approved for both units in SER.
		07	REVISION 07 UPDATE: 7.7.5 of SSER23 includes: "Based on its previous evaluation, as documented in the SER, and on its review of the information provided in TVA's letter dated July 30, 2010, the staff concludes that TVA's assessment of IE Information Notice 79-22 is acceptable, and that the staff's conclusions in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.7.6	23	C	Approved for both units in SER.
		07	REVISION 07 UPDATE: 7.7.6 of SSER23 includes: "Therefore, based on the staff's previous evaluation, as documented in the SER, and on its evaluation of the information provided by TVA in its response to staff questions, the conclusions in the SER remain valid." SSER23 shows the status for this item as "Resolved."
7.7.7	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.7.8	23	CO 07	ATWS Mitigation design was reviewed and approved for both units by a Safety Evaluation Report issued December 28, 1989. This SER is also in Appendix W of SSER9. Outstanding Issue was Technical Specifications requirements. In SSER14, NRC reviewed the revision of FSAR Figure 7.3-3 for the AMSAC automatic initiation signal to start the turbine driven and motor driven auxiliary feedwater pumps and considered the issue resolved. Unit 2 Action: Address in Technical Specifications as appropriate. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. ATWS is not addressed in either the Unit 1 TS or the Unit 2 TS; nor is it addressed in the Standard TS (NUREG-1431). REVISION 07 UPDATE: 7.7.8 of SSER23 includes: "Based on its previous evaluation, as documented in SSER 9 and SSER 14, and on its review of FSAR Amendments 92 through 103 and the information provided by TVA in its letter dated July 30, 2010, the NRC staff determines that its conclusions in the SSERs regarding the AMSAC system remain valid for WBN Unit 2." SSER23 shows the status for this item as "Resolved."
7.8	23	C 07	REVISION 07 UPDATE: 7.8 of SSER23 reads: "NUREG-0737 forwarded post-TMI accident requirements, which the NRC approved for implementation, to licensees of operating power reactors and applicants for operating licenses. Following the accident at TMI Unit 2, the NRC staff developed an action plan (NUREG-0660) to provide a comprehensive and integrated plan to improve safety at power reactors. Specific items from NUREG-0660 were approved by the Commission for implementation at reactors. In NUREG-0737, those specific items were gathered into a single document that includes additional information about schedules, applicability, method of implementation review, submittal dates, and clarification of technical positions. The total set of TMI-related actions were collected in NUREG-0660, but only those items that the Commission approved for implementation were included in NUREG-0737. The NRC staff reviewed the status of TMI action items for WBN Unit 2, as documented below." SSER23 shows the status for this item as "Resolved."
7.8.0	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.8.1	23	CI --- 07	NUREG-0737, II.D.3, "Valve Position Indication" – The design was reviewed in the original 1982 SER and found acceptable pending confirmation of installation of the acoustic monitoring system. In SSER5 (IR 390/84-35), the staff closed the LICENSE CONDITION for Unit 1 only. By letter dated November 7, 1994, for both units, TVA provided a revised response for NUREG-0737 Item II.D.3. TVA revised the design by relocating the accelerometers for valve position indication to downstream of the relief valves. This change was reviewed in SSER14. The revision did not change the function of the position indication hardware and did not alter the previous review. Unit 2 Action: Verify installation of the acoustic monitoring system to PORV to indicate position. CI in NRC May 28, 2008, letter. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- --- REVISION 07 UPDATE: 7.8.1 of SSER23 includes: "As documented in the NRC letter to TVA dated May 28, 2008 (ADAMS Accession No. ML081490093), the staff concluded that there is no change at WBN Unit 2 to the approved design. The NRC staff will verify installation of the acoustic monitoring system for the PORV position indication in WBN Unit 2 before fuel load. This is Open Item 74 (Appendix HH)." SSER23 shows the status for this item as "Open (Inspection)." --- Open Item 74 (Appendix HH) reads as follows: "The NRC staff will verify installation of the acoustic-monitoring system for the power-operated relief valve (PORV) position indication in WBN Unit 2 before fuel load. (Section 7.8.1)"
7.8.2	23	CI --- 07	NUREG-0737, II.E.1.2, "Auxiliary Feedwater System Initiation and Flow Indication" Unit 2 Action: Complete procedures and qualification testing. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). --- --- REVISION 07 UPDATE: 7.8.2 of SSER23 includes: "As documented in the NRC letter to TVA dated May 28, 2008 (ADAMS Accession No. ML081490093), the staff concluded that there is no change at WBN Unit 2 to the approved design. The NRC staff will verify that the test procedures and qualification testing are completed in WBN Unit 2 before fuel load.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			This is Open Item 75 (Appendix HH)." SSER23 shows the status for this item as "Open (Inspection)." ---------- Open Item 75 (Appendix HH) reads as follows: "The NRC staff will verify that the test procedures and qualification testing for auxiliary feedwater initiation and control and flow indication are completed in WBN Unit 2 before fuel load. (Section 7.8.2)"
7.8.3	23	C --- 07	NUREG-0737, II.K.3.9, "Proportional Integral Derivative Controller Modification" – Reviewed in original 1982 SER. Unit 2 Action: Set the derivative time constant to zero. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). ---------- ---------- REVISION 07 UPDATE: 7.8.3 of SSER23 includes: "In its letter to the NRC dated July 30, 2010 (ADAMS Accession No. ML1 02170077), TVA committed to setting the derivative time constant equal to zero in WBN Unit 2. The NRC staff concluded that this action satisfies the NUREG-0737 item. The NRC staff will verify that the derivative time constant is set to zero in WBN Unit 2 before fuel load. This is Open Item 76 (Appendix HH)." SSER23 shows the status for this item as "Open (Inspection)." ---------- Open Item 76 (Appendix HH) reads as follows: "The NRC staff will verify that the derivative time constant is set to zero in WBN Unit 2 before fuel load. (Section 7.8.3)" ---------- NRC Inspection Report 391/2011-605 closed NUREG-0737, II.K.3.9. ---------- NRC Inspection Report 391/2011-607 closed SSER (Appendix H) Open Item Number 76.
7.8.4	23	CI --- 07	NUREG-0737, II.K.3.10, "Anticipatory Trip At High Power" In SSER4, NRC concluded that TVA had adequately addressed the requirements of NUREG-0737 Item II.K.3.10 for removal of the anticipatory reactor trip on turbine trip at or below 50% power. Unit 2 Action: Unit 2 Technical Specifications and surveillance procedures will address this issue. ----------

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. Items 14.a. (Turbine Trip - Low Fluid Oil Pressure) and 14.b. (Turbine Trip - Turbine Stop Valve Closure) of TS Table 3.3.1-1 are the trips of interest. The table and the Bases for these items state that below the P-9 setpoint, these trips do not actuate a reactor trip. Per item 16.d. (Power Range Neutron Flux, P-9) of TS Table 3.3.1-1, the Nominal Trip Setpoint for P-9 is "50% RTP" and the Allowable Value is "< 52.4% RTP." REVISION 07 UPDATE: 7.8.4 of SSER23 includes: "The NRC staff reviewed the associated proposed WBN Unit 2 TS and surveillance requirements and concludes that there are no changes from the design approved in SSER 4 or from the WBN Unit 1 TS. Therefore, TVA's proposed actions for WBN Unit 2 are acceptable." SSER23 shows the status for this item as "Resolved."
7.8.5	23	C 07	NUREG-0737, II.K.3.12, "Confirm Existence of Anticipatory Reactor Trip Upon Turbine Trip" Approved for both units in the SER REVISION 07 UPDATE: 7.8.5 of SSER23 includes: "As documented in the NRC letter to TVA dated May 28, 2008 (ADAMS Accession No. ML081490093), the staff concluded that there is no change at WBN Unit 2 to the approved design. Therefore, it is acceptable to the staff." SSER23 shows the status for this item as "Resolved."
7.9.0	23	O 08	Area not addressed in 1981 Standard Review Plan. REVISION 07 UPDATE: 7.9.4 (Conclusion) of SSER23 reads: "Based on the NRC staff's review of the interfaces between the data communication systems and plant systems described in WBN Unit 2 FSAR Amendment 103, as supplemented by the TVA documents referenced above, the staff concludes that the data communication systems meet the relevant acceptance criteria identified in SRP Section 7.9, Revision 5, including the requirements of IEEE Std. 603-1991, Clause 5.6.3, and GDC 24 with regard to control and protection system interactions."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER23 DID NOT PROVIDE A STATUS; VERBIAGE SUGGESTS THE STATUS WOULD BE "RESOLVED." ---------- ---------- REVISION 08 UPDATE: 7.9.3.2 of SSER23 includes: "However, the NRC staff was not able to confirm that sufficient testing was performed to demonstrate that two-way communication was precluded by the specific configuration changes described above. TVA should confirm to the staff that testing has sufficiently demonstrated that two-way communication is precluded with the described configurations. This is Open Item 93 (Appendix HH)."
8.0.0	0	C	Approved for both units in SER.
8.1.0	24	O 07	Approved for both units in SER. ---------- ---------- REVISION 06 UPDATE: Section 8.1 of SSER22 included the following: "For the scenario in which an accident occurs in one unit and a concurrent shutdown of the second unit occurs with offsite power available, TVA determined that the auxiliary power system (APS) could adequately support the scenario for two-unit operation. The voltage recovery times were within the time limits so that the 6.9-kV shutdown board degraded voltage relays (DVRs) reset and would not separate the 6.9-kV shutdown boards from the offsite power source. For the scenario in which an accident occurs in one unit and a concurrent shutdown of the second unit occurs without offsite power, TVA stated that preoperational testing for WBN Unit 2 will validate the diesel response to load sequencing on the Unit 2 emergency diesel generators (EDGs). The staff noted that TVA did not provide a summary of the worst-case EDG loading analysis under this scenario for staff's review. The NRC staff will evaluate the status of this issue and will update the status of the EDG loading and load response in a future SSER. This is Open Item 26 (Appendix HH)." "The NRC staff reviewed the FSAR for this section against the relevant NRC regulations, guidance in SRP Section 8.1, and applicable RGs and, except for the open item discussed above, concludes that TVA is in compliance with the relevant NRC regulations. Before issuing an operating license, the NRC staff intends to conduct an onsite review of the installation and arrangement of electrical equipment and cables, confirmatory electric drawings, and verification of test results for the purpose of confirming the adequacy of the design and proper implementation of the design criteria. The NRC will address any issues identified during the onsite review in a supplement to the SER." SSER22 shows the status for this item as "Open (NRR)." ---------- TVA to NRC letter dated April 6, 2011, provided the following response to this Open Item 26: "There are four diesel generators (DGs) which supply onsite power to both Units 1 and 2 at Watts Bar Nuclear Plant. Each DG is dedicated to supply power to shutdown boards as follows:

* = See last page for status code definition.

- DG 1A-A feeds power into Unit 1, 6.9 kV shutdown board 1A-A
- DG 2A-A feeds power into Unit 2, 6.9 kV shutdown board 2A-A
- DG 1B-B feeds power into Unit 1, 6.9 kV shutdown board 1B-B
- DG 2B-B feeds power into Unit 2, 6.9 kV shutdown board 2B-B

Redundant trains of ESF loads for each unit are powered from each shutdown board. If offsite power is lost (LOOP), one train in each unit is capable of powering the loads required to mitigate the consequences of an accident or safely shut down the unit.

The following loading tables provide the blackout loading plus the common accident loads (load rejection, with an accident on the opposite unit and a loss of offsite power) for the safe shutdown of the non-accident unit. As discussed previously, these loadings are bounded by the accident loading."

[See letter for Tables.]

REVISION 07 UPDATE:

[all portions are from SSER24]

8.1 includes:

"The NRC staff verified that TVA revised WBN 2 FSAR Section 8.3.1.4.1 to require any conduit exceeding 40 percent cable fill to be evaluated and justified by TVA engineering. Based on this information, Open Item 3 is closed."

AND

"In NRC Inspection Report 05000391/2011604, dated June 29, 2011 (ADAMS Accession No. ML111810890), NRC Region II documented its inspection and review of Open Item 18. Based on the results documented in the inspection report, Open Item 18 is closed."

AND

"In NRC Inspection Report 05000391/2011604, dated June 29, 2011 (ADAMS Accession No. ML111810890), NRC Region II documented its inspection and review of Open Item 19. Based on the results documented in the inspection report, Open Item 19 is closed."

AND

"The NRC staff performed an inspection to verify the qualification pedigree of the subject motors, as documented in NRC Inspection Report 0500391/2011605, dated August 5, 2011 (ADAMS Accession No. ML112201418). Based on the inspection results, Open Item 20 is closed."

AND

"Based on this response, the NRC staff concluded that TVA adequately clarified the use of the term "equivalent" as it relates to the replacement of terminal blocks; and therefore, Open Item 22 is closed."

AND

"Open Item 23 required the NRC staff to resolve whether or not TVA's reasoning for not upgrading the main steam isolation valve (MSIV) solenoids to Category I is a sound reason to the contrary, as specified in 10 CFR 50.49(l).

In its letter dated April 6, 2011, TVA provided additional information regarding Open Item 23. TVA stated that it will qualify the MSIV solenoids to the Category I criteria.

Based on this information, the NRC staff finds Open Item 23 remains open until NRC inspection can be performed to verify that the MSIV solenoids have been qualified to the Category I criteria."

AND

"Based on its review of this calculation, the staff concludes that TVA has provided adequate justification for establishment of a mild environment threshold for the electronic components identified in the calculation for WBN Unit 2. Specifically, the staff concludes that the calculation demonstrates that the mild environment threshold ensures continued operation of electronic equipment under postulated conditions. Therefore, Open Item 24 is closed."

AND

"In its letter dated April 6, 2011, TVA stated that, 'A separate load flow was performed for a dual unit shutdown resulting from an abnormal operational occurrence with and without offsite power.' TVA provided a summary of resulting loading on CSSTs. The staff reviewed the loading and margins available and concluded that the CSSTs are adequately rated for postulated conditions. Therefore, Open Item 27 is closed."

AND

"The NRC staff reviewed the summary of analyses provided and concluded that TVA's approach to evaluate the capability of the LTCs as acceptable because it meets the requirements of GDC 17. Therefore, Open Item 28 is closed."

AND

"Based on the results of the TSS report and grid operating parameters provided by TVA in its letter dated June 7, 2011, the NRC staff concludes that the offsite source operating range meets the requirements of GDC 17 and is acceptable for WBN Units 1 and 2 operations. Therefore, Open Item 29 is closed."

AND

"The NRC staff concludes that TVA's clarification is adequate, since it provides the necessary information regarding the sequencing of loads in case of a non-simultaneous LOOP-LOCA event, and that such an event is considered as a beyond design basis event. Therefore, Open Item 31 is closed."

AND

"TVA stated in Attachment 9 of its letter dated July 31, 2010, that certain design change notices (DCNs) are required or anticipated for completion of WBN Unit 2, and that these DCNs were unverified assumptions used in its analysis of the 125 Vdc vital battery system. Open Item 33 required the NRC staff to verify completion of these DCNs prior to issuance of the operating license. The applicable DCNs are as follows:

* DCN 53421: removal/abandonment of Reciprocating Charging Pump 2-MTR-62-101, supplied from 480V SHDN BD 2B1-B, Compt. 3B.

* DCN 54636: cable modifications for Unit 2 AFWP Turbine Trip and Throttle Valve and Turbine Controls.

In its letter dated April 6, 2011, TVA stated that the above DCNs have been issued and that the NRC will be notified when the physical work has been completed for these two DCNs. Open Item 33 remains open until the NRC staff has verified by inspection that the DCNs have been incorporated into the WBN Unit 2 design."

SSER24 shows the status for this item as "Open (NRR)."

Open Item 23 (Appendix HH) reads as follows:

"Resolve whether or not TVA's reasoning for not upgrading the MSIV solenoid valves to Category I is a sound reason to the contrary, as specified in 10 CFR 50.49(l). (SSER 22, Section 3.11.2.2.1; SSER 24, Section 8.1)"

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			--- Open Item 33 (Appendix HH) reads as follows: "TVA stated in Attachment 9 of its letter dated July 31, 2010, that certain design change notices (DCNs) are required or anticipated for completion of WBN Unit 2, and that these DCNs were unverified assumptions used in its analysis of the 125 Vdc vital battery system. Verification of completion of these DCNs to the NRC staff is necessary prior to issuance of the operating license. (SSER 22, Section 8.3.2.3; SSER 24, Section 8.1)" --- --- REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed SSER (Appendix H) Open Item Number 20.
8.2.0	0	C	Approved for both units in SER.
8.2.1	22	S 06	Approved for both units in SER. In SSER13, NRC reviewed TVA's analysis of grid stability on loss of both units. The NRC conclusions in the SER remained valid. --- --- REVISION 06 UPDATE: Section 8.2.1 of SSER22 included, "TVA has not evaluated the capability of the CSSTs for a dual-unit shutdown resulting from an abnormal operating occurrence. This is discussed in section 8.2.2 as Open Item 27 (Appendix HH) discussed in section 8.2.2. Pending resolution of the open item, the staff concludes that design of WBN Unit 2 meets intent of GDC 5." SSER22 shows the status for this item as "Open (NRR)." --- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 27: "TVA to NRC letter dated December 6, 2010, 'Watts Bar Nuclear Plant (WBN) Unit 2 – Safety Evaluation Report Supplement 22 (SSER22) – Response to Requests for Additional Information,' (ADAMS accession number ML103420569) included the response to RAI 8.2.2 - 1. That response stated, 'The loading for a dual unit trip (item a) is slightly less than the loading with one unit in accident and a spurious accident signal in the other unit. Therefore, a separate load flow was not performed.' A separate load flow was performed for a dual unit shutdown resulting from an abnormal operational occurrence with and without offsite power. The resulting loading on CSSTs is provided in the following table: [See letter for Table.] The worst case margin for CSSTs C and D is 70% (X, Y winding) and 55% for primary winding. The worst case margin for CSSTs A and B is 27% (X, Y winding) and 18% for primary winding. This additional analysis will be included in the next revision of AC Auxiliary Power System Analysis Calculation EDQ00099920070002."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
8.2.2	22	S 06	8.2.2.1 CONFIRMATORY ISSUE - document additional information in FSAR on control power supplies and distribution system for the Watts Bar Hydro Plant Switchyard In the original 1982 SER, NRC concluded that the offsite power system circuits at the Watts Bar Hydro Plant Switchyard met GDC 17 pending documentation in the FSAR. The information was added to the FSAR. In SSER2, NRC closed the issue. In SSER13, the staff reviewed revised information incorporated into FSAR amendment 71 for both units and concluded that it supported the original conclusion in SSER2. ---------- 8.2.2.2 OUTSTANDING ISSUE involving compliance of design changes to the offsite power system with GDC 17 and 18. In SSER2 and 3, NRC continued the review of the offsite electrical power system. By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, the NRC reviewed the design changes to minimize the probability of losing all AC power, compliance with GDC 17 and minimizing the probability of a two unit trip following a one unit trip. These issues were resolved in SSER13. Additional review was done in SSER14, but the conclusions remained valid. ---------- 8.2.2.3 Compliance with GDC 17 for the Duration of the Offsite System Contingencies By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC reviewed the load shed scheme described in FSAR amendment 71 that reduces loads from common station service transformers A and B including contingency for both units trip and a 161-kV supply contingency. In SSER15, NRC determined that entering the LCO for one offsite circuit inoperable was appropriate. No open items were identified. ---------- 8.2.2.4 Minimizing the Probability of a Two-Unit Trip Following a One-Unit Trip By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In FSAR amendment 71, TVA described the transfer of power sources on trip of a unit's main generator. In SSER13, NRC evaluated the design and determined that the concern was resolved. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is "Open (NRR)." ---------- ---------- REVISION 06 UPDATE: Section 8.2.2 of SSER22 includes: "TVA should provide a summary of similar margin studies based on a dual-unit trip as a result of an abnormal operational occurrence and an accident in one unit concurrent with a spurious ESF actuation. These should be based on the completed analysis for uprating CSSTs A and B. This is Open Item 27 (Appendix HH)." "TVA should provide to the staff a detailed discussion showing that the LTC is able to maintain the 6.9-kV bus voltage control band given the normal and post contingency transmission operating voltage band, bounding voltage drop on the grid, and plant conditions. This is Open Item 28 (Appendix HH)."

* = See last page for status code definition.

"In its December 6, 2010, letter, TVA stated that the grid stability analyses addressed the loss of the largest electric supply to the grid, loss of the largest load from the grid, loss of the most critical transmission line, loss of both units, all of which did not result in grid instability. NRC staff considers the stability analysis portion of the grid studies acceptable. However, TVA did not provide information about the operating characteristics of the offsite power supply and other information as discussed above. This is Open Item 29 (Appendix HH)."

SSER22 shows the status for this item as "Open (NRR)."

TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 27:

"TVA to NRC letter dated December 6, 2010, 'Watts Bar Nuclear Plant (WBN) Unit 2 – Safety Evaluation Report Supplement 22 (SSER22) – Response to Requests for Additional Information,' (ADAMS accession number ML103420569) included the response to RAI 8.2.2 - 1. That response stated, 'The loading for a dual unit trip (item a) is slightly less than the loading with one unit in accident and a spurious accident signal in the other unit. Therefore, a separate load flow was not performed.'

A separate load flow was performed for a dual unit shutdown resulting from an abnormal operational occurrence with and without offsite power. The resulting loading on CSSTs is provided in the following table:

[See letter for Table.]

The worst case margin for CSSTs C and D is 70% (X, Y winding) and 55% for primary winding. The worst case margin for CSSTs A and B is 27% (X, Y winding) and 18% for primary winding.

This additional analysis will be included in the next revision of AC Auxiliary Power System Analysis Calculation EDQ00099920070002."

TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 28:

"For CSSTs C and D, the load tap changer (LTC) is set to regulate 6.9kV shutdown board voltage at 7,071V (102.5%). For CSSTs A and B, the LTC is set to regulate the voltage at the 6.9kV start buses (which can power the 6.9kV shutdown boards through the 6.9kV unit boards) at 7,071V (102.5%). The upper and lower setpoints of the dead bands are 7,132V (103.4%) and 7,010V (101.6%), respectively. The dead band considered is ±82.2V equivalent to the operating tolerances identified for these setpoints. The LTCs have the following parameters:

CSST C and D: Taps ±10%, Tap Step 1.25%, Total No of Taps 17, Initial Time Delay 2 seconds, Operating Time 1 second. Taps are provided on each secondary winding.

CSST A and B: Taps ±16.8%, Tap Step 1.05%, Total No of Taps 33, Initial Time Delay 1 second, Operating Time 2 seconds. Taps are provided on the primary winding.

The analysis evaluates the 6.9-kV shutdown board minimum voltage requirements considering a maximum (bounding) grid voltage drop of 9 kV and a minimum grid voltage of 153kV and all plant conditions. Although the calculated shutdown board voltage falls below the degraded voltage relay dropout setpoint due to block start of ESF motors, it recovers above the degraded voltage relay reset setpoint in ≤5 seconds. The minimum time for the degraded voltage relays to isolate the offsite power from the 6.9kV Shutdown Boards is 8.5 seconds.

Attachment 3 [See letter for this.] provides the Electrical Transient Analysis Program (ETAP) voltage recovery plots following a DBE on one unit while the other unit is in simultaneous orderly shutdown. These plots pictorially depict the LTC function at different times following a DBE.

During normal operation and post-accident with bounding grid voltage (153kV), the voltage on the 6.9kV shutdown boards is maintained within the LTC control band. As shown in the ETAP plots, the voltage on

the shutdown boards falls below the degraded voltage relay setpoint due to block start of ESF motors but recovers to a value above the degraded voltage relay reset value before the degraded voltage relay timer times out so as not to isolate the shutdown boards from the offsite power. The source is therefore in compliance with GDC 17 and is able to supply offsite power to 1E loads with an accident in one unit, safe shutdown of the opposite unit, and the worst case single failure."

TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 29:

"The operating characteristics of the offsite power supply were delineated in TVA letter to the NRC dated November 09, 2010 (ML103200146). However, they are provided below for the staff convenience. In addition TVA has issued Revision 3 of Watts Bar Nuclear Plant (WBN) - Transmission System Study (TSS) - Grid Voltage Study of the WBN Offsite Power System. This revision has evaluated the adequacy of the offsite power system postulating an accident in one unit and a spurious accident signal in the second unit. The results show that the WBN offsite power system has adequate capacity to cope with this scenario (i.e., an accident in one unit and a spurious accident signal in the second unit)

The preferred offsite power system at WBN is normally supplied from TVA's 161-kV transmission grid at the Watts Bar Hydro Plant switchyard. Normally, the frequency of the grid is 60 Hz, with very small perturbations above and below this value. The TVA Under Frequency Load Shed scheme is compliant with NERC/SERC standards, and the first step will begin tripping transmission system load at 59.5 Hz. The final step in the program trips load at 58.7 Hz. Current studies show that the frequency will not drop below 57.5 Hz during any credible extreme contingencies.

The criteria used in the planning of the transmission system state that the 161-kV voltage should not drop below 95% of nominal voltage for NERC Category B or C events. Normally, the 161-kV grid at the WBN offsite power buses operates at 166 kV, with ranges from 161 kV to 170 kV occasionally observed.

Two Transmission System Studies (TSSs), a Planning TSS and an Operations TSS, are performed by Power System Operations (PSO) tri-annually or as needed. The Planning TSS is a 5-year look-ahead study to ensure the transmission network will meet the WBN voltage criteria. Transmission enhancements are made if needed. The Operations TSS is used to ensure the network can meet the grid criteria during real time operation. In extreme cases, if the grid is unable to meet voltage criteria, the Transmission Operator will immediately notify the WBN Generator Operator that offsite power is disqualified.

a. Operating characteristics of the preferred offsite power supply (at Watts Bar Hydro Plant Grid): 164 kV nominal

b. Voltage criteria for WBN for dual-unit analysis:
   - 161 kV Switchyard: > 153 kV and < 9 kV drop (post-event)
   - 24 kV Generator Buses*: > 23 kV and < 24.8 kV

   * Applicable only when utilizing Unit Board feeders as offsite power (the Unit Station Service Transformers [USSTs] supply offsite power until they transfer to the Common Station Service Transformers [CSSTs] A and B).

c. Post-contingency voltage drops (dual-unit operation): 9 kV Maximum (The grid studies show that under the worst case scenario the maximum voltage drop will not exceed 6.5 kV. The auxiliary power system analysis for two-unit operation has been performed using a 161 kV grid voltage drop of 11 kV when powered from CSSTs C and D and 9 kV when powered from CSSTs A and B. CSSTs A and B will be used to substitute for CSSTs D and C, respectively, in case of CSST C or D outage.)

d. Bounding value & Post unit trip value: 153 kV (Minimum)

   (The grid studies establish that there are no voltage criteria violations under all grid operating conditions.)

e. Operating frequency range (dual-unit operation): Normally the frequency of the grid is 60 Hz with very small perturbations and is compliant with NERC/SERC standards and the first step begins tripping transmission system load at 59.5 Hz.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			f. Design operating voltage range of the shutdown boards: 7,260 V max; 6,570 V min g. How low the WBHS voltage can drop: 153 kV"
8.2.3	22	S 06	Approved for both units in SER. REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
8.2.4	22	O 06	Approved for both units in SER. REVISION 06 UPDATE: Section 8.2.4 of SSER22 included, "The NRC staff reviewed the offsite power system for WBN Unit 2 as described in FSAR Section 8.2, including the single-line diagrams, station layout drawings, schematic diagrams, and descriptive information. The staff concluded that the offsite power system conforms to the requirements of GDC 17 and 18 and is, therefore, acceptable, pending resolution of the open items noted above." SSER22 shows the status for this item as "Open (NRR)."
8.3.0	0	C	Approved for both units in SER.
8.3.1	22	S 06	8.3 Fifth Diesel Generator In SSER10, NRC reviewed the design of the fifth diesel generator. In SSER19, NRC accepted TVA's commitment to perform modifications and surveillances including preoperational testing before declaring the fifth diesel generator operable as a replacement for one of the four diesel generators. TVA stated in a submittal dated July 28, 1993, that they did not plan to place the additional diesel generator in service. --- 8.3.1.1: CONFIRMATORY ISSUE - incorporate new design that provides dedicated transformer for each preferred offsite circuit in FSAR In the original 1982 SER, NRC concluded that the offsite power system with a dedicated transformer for each preferred offsite circuit met GDC 17 pending documentation in the FSAR. The information was added to the FSAR. In SSER2, NRC closed the issue. In SSER13, NRC reviewed additional changes though FSAR amendment 75 and concluded that the design was acceptable. --- 8.3.1 DG Starting and Control Circuit Logic In SSER10, NRC reviewed the DG starting and control circuit logic. No open items were identified. --- 8.3.1.2 Low and Degraded Grid Voltage Condition

* = See last page for status code definition.

In the SER, NRC stated they would verify the adequacy of TVA's analysis regarding Branch Technical Position PSB-1 once preoperational testing was completed. In SSER13, the NRC reviewed information on the load shed and diesel start relays. In SSER14 NRC clarified the requirements. In SSER20, NRC reviewed the preoperational test for Unit 1.

Unit 2 Action: Include the setpoint in the Technical Specifications for the load shed relays and similar minimum limits for the diesel start relays.

8.3.1.6: CONFIRMATORY ISSUE - provide diesel generator reliability qualification test report

In SSER2, NRC indicated that it would verify DG qualification testing. TVA provided a copy of the DG qualification test report. In SSER7, the NRC concluded that the DGs had been satisfactorily tested in accordance with IEEE 387-1977.

8.3.1.6: LICENSE CONDITION (12) - Diesel generator reliability qualification testing at normal operating temperature

In the original 1982 SER, NRC required that the capability of the DGs to start at normal temperature be demonstrated. TVA's August 31, 1983, letter confirmed tests had been performed on a DG identical to those at WBN. In SSER2, NRC closed the issue.

8.3.1.7 Possible Interconnection Between Redundant Divisions Through Normal and Alternate Power to the Battery Charger

By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, the NRC reviewed the use of alternate feeders to the battery chargers and inverters and concluded a Technical Specification surveillance for monitoring the position of these supply breakers resolved the item.

Unit 2 Action: Include the surveillance requirement in the Technical Specifications.

8.3.1.10 No-load Operation of the Diesel Generator

By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, the NRC reviewed the information provided and concluded the issue was resolved. In SSER14, NRC added additional clarification but did not change the conclusions.

8.3.1.11 Test and Inspection of the Vital Power System

By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, the NRC reviewed TVA's plan for test and inspection of the vital ac system and concluded the issue was resolved.

8.3.1.12 The Capability and Independence of Offsite and Onsite Sources When Paralleling During Testing

By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, the NRC reviewed the Emergency Diesel Generators response to a loss-of-offsite-power (LOOP). TVA submitted additional information for both units by letters dated February 7, 1994 and June 29, 1994. In SSER14, NRC

concluded that the issue was resolved.

8.3.1.13 Use of an Idle Start Switch for Diesel Generators

By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, the NRC reviewed the information presented on the local idle start switch and concluded the issue was resolved.

8.3.1.14 Master Fuse List Program

In SSER9, NRC provided a safety evaluation of the Master Fuse List Special Program (SP) for Unit 1 (Appendix U). In SSER13, NRC referenced the evaluation.

Unit 2 Action: Resolve the SP for WBN Unit 2 with the Unit 1 approach.

REVISION 02 UPDATE:

The status in SSER21 is Open (NRR).

Revised "SSER18" to "SSER19" item 8.3 above to fix typographical error in Regulatory Framework.

Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009.

8.3.1.2: TS Table 3.3.5-1 provides Diesel Generator start and load shed relay trip setpoints and allowable values.

8.3.1.7: TS surveillance requirements SR 3.8.4.3 and SR 3.8.7.1 provide surveillances to check the alignment of battery charger alternate feeder breakers and inverters.

8.3.1.14: TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Master Fuse List Special Program.

In SSER21 the Containment Cooling SP was resolved. Completion of the Master Fuse List SP is tracked under 23.3.5.

REVISION 06 UPDATE:

Section 8.3.1.2 of SSER22 included, "TVA should confirm that all safety-related equipment (in addition to the Class 1E motors) will have adequate starting and running voltage at the most limiting safety-related components (such as motor-operated valves (MOVs), contactors, solenoid valves or relays) at the DVR setpoint dropout setting. TVA should also confirm that (1) the motorstarting transient studies are based on the dropout voltage value of DVR and time delay, (2) the steady-state voltage drop studies are carried out by maximizing running loads on the Class 1E distribution system (bounding combination of safety systems loads), with the voltage at 6.9-kV Class 1E buses (monitored by the DVRs) at or just above the DVR dropout setting, and (3) the DVR settings do not credit any equipment operation (such as LTC transformers) upstream of the 6.9-kV Class 1E buses. TVA should also confirm that the final technical

specifications (TSs) are properly derived from these analytical values for the degraded voltage settings. This is Open Item 30 (Appendix HH)."

Section 8.3.1.11 of SSER22 included, "If the FSAR description is correct, TVA should explain how the EDG and logic sequencing circuitry will respond to a LOCA followed by a LOOP scenario. This is Open Item 31 (Appendix HH)."

Section 8.3.1.12 of SSER22 included, "In its letter dated December 6, 2010, TVA stated that Amendment 103 to the Unit 2 FSAR will revise the Equipment Capacities portion of Section 8.3.1.1 to match the information in Tables 8.3-4 through 8.3-.7. The staff finds the TVA response acceptable."

Section 8.3.1.14 of SSER22 included, "TVA should provide to the NRC staff the details of the administrative limits of EDG voltage and speed range, along with the basis for its conclusion that the impact is negligible. TVA should also describe how it accounts for the administrative limits in the TS surveillance requirements for EDG voltage and frequency. This is Open Item 32 (Appendix HH)."

SSER22 shows the status for this item as "Open (NRR)."

TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 31:

"LOCA followed by LOOP

TVA to NRC letter dated December 6, 2010, 'Watts Bar Nuclear Plant (WBN) Unit 2 – Safety Evaluation Report Supplement 22 (SSER22) – Response to Requests for Additional Information,' (ADAMS accession number ML103420569) included the response to RAI 8.3.1.11. That response stated, 'A LOCA followed by a delayed LOOP is not a Design Basis Event for WBN.'

The design basis for WBN assumes a simultaneous LOOP - LOCA. The Hydraulic Analysis does not support a LOCA with a delayed LOOP event; however, the logic is designed to ensure that loads are re-sequenced during a LOCA with a delayed LOOP, to prevent a block start on a diesel generator. This logic does not impact the sequencing for the design bases event, simultaneous LOOP - LOCA.

LOOP - Delayed LOCA.

When the LOOP occurs, the diesel will start, based on detection by the Loss of Voltage relay. Loads which sequence on due to a blackout signal (Charging Pump, Auxiliary Feedwater, Essential Raw Cooling Water Pump, Closed Cooling, etc.) will begin sequencing on.

When a subsequent LOCA signal occurs, the diesel will remain running and connected to the Shutdown Board. Loads which are required for accident mitigation and which have previously sequenced on to the Shutdown Board, due to the LOOP, will remain running. Loads which are not required for accident mitigation will be tripped. Remaining loads required for accident mitigation, which have not been sequenced on at the time of the LOCA, will have their timers reset to 0 and will sequence on at the appropriate time for the LOCA signal.

LOCA - Delayed LOOP

When the LOCA occurs, the loads which are not running in normal operation will block start. At the same time, the diesels will start on the LOCA signal, but will not tie to the Shutdown Board.

When a subsequent LOOP occurs, all sequenced loads will be stripped from the board from a Loss of Voltage (approximately 86%) signal. Once the loss of voltage relay has reached its set point and the diesel is available, the diesel breaker will close and the sequence timers will begin to time. The first large motor (Centrifugal Charging Pump) connects at 5 seconds and is followed by the remaining accident required loads. This provides assurance that the voltage has decayed on the boards and no residual out of phase reconnection occurs."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
8.3.2	22	S 06	8.3.2.2: LICENSE CONDITION – DC monitoring and annunciation system In SSER3, the staff determined that some items were omitted from the design of the DG DC monitoring and annunciation system. By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC closed the issue. ---------- 8.3.2.4: CONFIRMATORY ISSUE - include diesel generator design analysis in FSAR In the original 1982 SER, staff indicated the design analysis for demonstrating compliance of the DGs with regulatory requirements and guidelines was acceptable pending incorporation of the analysis in the FSAR. The analysis was incorporated in the FSAR, and the issue closed in SSER2. By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC indicated that the issue was resolved. ---------- 8.3.2.5 Non-safety Loads Powered from the DC Distribution System and Vital Inverters By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC indicated that the issue was resolved. ---------- 8.3.2.5.1 Transfer of Loads Between Power Supplies Associated with the Same Load Group but Different Units By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC reviewed the information provided. Additional information was requested for both units by letter dated March 28, 1994. TVA responded for both units by letter dated June 29, 1994. In SSER14, NRC indicated that the issue was resolved. ---------- 8.3.2.7 The Fifth Vital Battery System By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC indicated that the issue was resolved. ---------- 8.3.2.8 Reenergizing the Battery Charger from the Onsite Power Sources Versus Automatically Immediately Following a Loss of Offsite Power By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC indicated that the issue was resolved. ---------- ---------- REVISION 06 UPDATE: Section 8.3.2.3 of SSER22 included, "TVA stated that the design change notices (DCNs) are required or anticipated for completion of WBN Unit 2, and that these were unverified assumptions used in its analysis of the 125-V dc vital battery system. Verification of the completion of these DCNs must be provided to the NRC staff before issuance of the operating license. This is Open Item 33 (Appendix HH)."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Open (NRR)." ---------- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 33: "The applicable DCNs are as follow: • DCN 53421 for the removal/abandonment of Reciprocating Charging Pump 2-MTR-62-101, supplied from 480V SHDN BD 2B1-B, Compt. 3B, has been issued. • DCN 54636 for the cable modifications for Unit 2 AFWP Turbine Trip and Throttle Valve and Turbine Controls has been issued. NRC will be notified when the physical work has been completed for these two DCNs."
8.3.3	22	S --- 06	8.3.3.1.1: CONFIRMATORY ISSUE involving submergence of electrical equipment as result of a LOCA In the original 1982 SER and SSER3, staff stated that the design for the automatic deenergizing of loads as a result of a LOCA would be verified as part of the site visit. During the August 1991, visit and in a letter for both units dated September 13, 1991, TVA committed to revise the FSAR. The information was added to the FSAR in amendment 71. In SSER13, NRC closed the issue. ---------- 8.3.3.1.3 Failure Analysis of Circuits Associated with Cables and Cable Splices Unqualified for Submergence By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC reviewed the submergence calculation and closed the issue. Unit 2 Action: Revise calculation for WBN Unit 2. ---------- 8.3.3.1.2: CONFIRMATORY ISSUE - verify design for bypass of thermal overload protective device In the original 1982 SER, NRC indicated that the design for bypass of thermal overload protective devices on safety-related motor operated valves would be verified during the electrical drawing review. The staff subsequently reviewed the drawings and closed the issue in SSER2. ---------- 8.3.3.1.4 Use of Waterproof Splices in Potentially Submersible Sections of Underground Duct Runs By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13 and 14, NRC raised a concern on splice usage in raceways. TVA submitted additional information for both units by letters dated November 18, 1994, and January 5, 1995. In SSER15, NRC found that TVA had adequately justified the acceptability of the installed splices at Watts Bar. ---------- 8.3.3.1.5 Dow Corning RTV-3140 Used to Repair Damaged Kapton Insulated Conductors In SSER15, NRC reviewed the use of RTV-3140. TVA submitted the technical basis for use in a December 6, 1994, letter for both units. TVA completed additional testing and told the NRC of the limited use of this repair method for both units by letter dated February 10, 1995. In SSER15, NRC found the use of RTV-3140 acceptable for the limited use described.

* = See last page for status code definition.

8.3.3.1.6 Cable Damage Near Splices and Terminations

In SSER16, NRC reviewed TVA's corrective action plan for Construction Deficiency Report 390/95-02 and found the limited inspections for damaged Class 1E cables to 10 CFR 50.49 installations acceptable. This was a WBN Unit 1 only CDR.

8.3.3.2: CONFIRMATORY ISSUE - revise FSAR to reflect requirements of shared safety systems

In the original 1982 SER, the staff stated that the description and analysis of shared onsite AC and DC systems was under review but was acceptable pending revision of the FSAR. In SSER3, the confirmatory issue was left open to track additional information to be incorporated in the FSAR. In a letter dated September 13, 1991, TVA provided the additional information. In SSER13, NRC closed the issue. In SSER14, NRC added additional clarification.

8.3.3.2.2 Sharing of AC Distribution Systems and Standby Power Supplies Between Units 1 and 2

In the SER and SSER3, NRC reviewed the design to the guidelines of RG 1.81 and determined it was acceptable pending revision to the FSAR. NRC noted discrepancies in the FSAR. By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. In SSER13, NRC closed the issue.

8.3.3.2.3: CONFIRMATORY ISSUE for design of sharing raceway systems between units

In the original SER, NRC indicated that the design for sharing of raceway systems between units would be verified during the electrical drawing review. The staff confirmed that cable routing was in accordance with accepted separation criteria and closed the issue in SSER2.

8.3.3.2.4: LICENSE CONDITION – Possible sharing of DC control power to AC switchgear

In the original 1982 SER, staff required that all possible interconnections between redundant divisions through normal and alternate power sources to various loads be identified in the FSAR. TVA letter dated January 17, 1984, provided the information. NRC closed the issue in SSER3.

8.3.3.3: LICENSE CONDITION – Testing of associated circuits

In the original 1982 SER, staff required that protective devices used to isolate non-Class 1E from Class 1E circuits be of high quality commensurate with their importance to safety and be periodically tested. TVA letter dated January 17, 1984, provided the information. NRC closed the issue in SSER3.

8.3.3.3: LICENSE CONDITION – Testing of non-class 1E cables

In the original 1982 SER, staff required that protective devices used to isolate non-Class 1E from Class 1E circuits be of high quality commensurate with their importance to safety and be periodically tested. TVA letter dated January 17, 1984, provided additional information. NRC closed the issue in SSER3.

8.3.3.3 Physical Independence (Compliance with GDC 17)

By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. The information was incorporated into the FSAR by amendment 71. Surveillance requirements for the testing of protective devices used to protect Class 1E circuits from failure of non-Class 1E circuits were incorporated into the Technical Requirements Manual (TRM). This issue was closed based on review of the TRM in SSER13.

Unit 2 Action:

Incorporate testing requirements into the Unit 2 TRM.

8.3.3.3 Physical Independence (Compliance with GDC 17)

In SSER13, NRC cited differences between RG 1.75 and the WBN design criteria (WB-DC-30-4). In SSER14, NRC continued the review. NRC requested additional information for both WBN units by letter dated March 28, 1994. TVA responded for both WBN units by letters dated July 29, 1994, January 11, 1995, and June 5, 1995. In SSER16, NRC found separation between open cable trays (including cables in free air) adequate.

8.3.3.5.1 Compliance with Regulatory Guides 1.108 and 1.118

In SSERs 13, 14 and 15, NRC reviewed WBN compliance with RGs 1.108 and 1.118. In SSER13, NRC reviewed WBN's use of temporary jumper wires when portable test equipment is used during testing. The justification was documented in the FSAR. In SSER14 and 15, NRC reviewed Class 1E standby power system testing, testing DG full load rejection capability and non-class 1E circuitry for transmitting signals needed for starting DGs. NRC concluded that the features were appropriately tested.

8.3.3.5.2: CONFIRMATORY ISSUE - incorporate commitment to test only one of four diesel generators at one time

In the original 1982 SER, the NRC found the commitment to test DGs one at a time acceptable pending its incorporation into the FSAR. In SSER2, NRC reviewed the documentation and closed the issue.

8.3.3.5.3 Time Constraints for Stability of EDG During No-Load Startup Testing

In SSER16, NRC reviewed and approved changes to the no load emergency diesel generator testing surveillance requirements.

Unit 2 Action:

Incorporate into WBN Unit 2 TS surveillances.

8.3.3.6: CONFIRMATORY ISSUE involving evaluation of penetrations' ability to withstand failure of overcurrent protection device

In the original 1982 SER, staff required a reevaluation of the penetrations' capability to withstand, without seal failure, the total range of available time-current characteristics assuming a single failure of any overcurrent protective device. In SSER3, staff found the results of the evaluation acceptable pending the information being incorporated in the FSAR. The staff reviewed the FSAR and closed the issue for both units in SSER7.

8.3.3.6: LICENSE CONDITION – Testing of reactor coolant pump breakers

In the original 1982 SER, staff required that the redundant fault current protective devices for the reactor coolant pump circuits meet RG 1.63. In SSER2, staff reviewed the design and concluded it met RG 1.63.

8.3.3.6 Compliance with GDC 50

By letter dated June 20, 1991, for both units, NRC requested additional information on Section 8 of the FSAR. TVA responded for both units by letter dated September 13, 1991. The information was incorporated into the FSAR in amendment 70. In SSER13, NRC indicated that the issue was resolved.

REVISION 02 UPDATE:

The status in SSER21 is Open (NRR).

Developmental Revision B of the Unit 2 Technical Specifications (TS) and Technical Requirements Manual (TRM) was submitted on February 2, 2010.

8.3.3.3: TRM TR 3.8.1 specifies testing of circuit breakers that are used as isolation devices protecting 1E busses from non-qualified loads.

8.3.3.5.3: TS Sections 3.8.1.7, 3.8.1.12, 3.8.1.15 and 3.8.1.21 require that voltage and frequency remain within specified limits following a fast start.

REVISION 06 UPDATE:

Section 8.3.3.1.1 of SSER22 included, "Therefore, the NRC staff considers the issue of submerged electrical equipment as a result of a LOCA to be resolved."

Section 8.3.3.1.2 of SSER22 included, "The NRC staff concludes that the above clarification by TVA is acceptable, and the issue of thermal overload protective bypass is resolved."

Section 8.3.3.2 of SSER22 included, "In its December 6, 2010, letter, TVA stated that the adequacy of selective tripping has been verified to assure protection of safety-related dc systems from failure in the non-Class 1E circuits and common or safety/nonsafety-related circuits. All cascaded fuses were tested for selective coordination with the upstream protective devices."

Section 8.3.3.2.1 of SSER22 included, "Based on the information provided by TVA, the NRC staff concludes that TVA has demonstrated that the sharing of the dc system will not significantly impair the ability of the system to perform its intended safety functions, including the scenario encompassing an accident in one unit and the orderly shutdown and cooldown of the remaining unit while considering the effects of a single failure. Therefore, the staff considers this issue resolved."

Section 8.3.3.2.2 of SSER22 included, "The electrical ac and dc systems have common buses and nonsafety loads supplied from train A or train B power supplies. In its letter dated August 30, 2010, TVA stated that separation is provided by selective coordination of protective devices for all ac (including 480 V) and dc circuits with molded case circuit breaker (MCCB) combinations or MCCB and fuse combinations or fuse/fuse combinations. Since selective coordination exists between the non-Class 1E and Class 1E circuits, the NRC staff concludes that this is acceptable."

Section 8.3.3.2.3 of SSER22 included, "Verification of the shared raceway design's conformance with GDC 5 through reviews of plant drawings and installation inspections is subject to the NRC construction inspection program."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Section 8.3.3.2.4 of SSER22 included, "In its response letter dated December 6, 2010, TVA stated that Section 8.3.2.1.1, "Physical Arrangements of Components," in the WBN Unit 2 FSAR discusses that the interconnection between redundant divisions of normal and alternate power sources for the components listed in FSAR Table 8.3-10 is arranged to provide adequate physical isolation and electrical separation to prevent a common mode failure. The listed components in FSAR Table 8.3-10 also meet the staff's positions identified in Section 8.3.1.7 of the staff SER. TVA has reviewed the components listed in WBN Unit 2 FSAR Table 8.3-10 and verified that their normal and alternate power supplies are physically and electrically separated. TVA has indicated that the Integrated Safeguards Test conducted in accordance with RG 1.41, "Preoperational Testing of Redundant Onsite Electric Power Systems to Verify Proper Load Group Assignments," will demonstrate the independence of the divisions and furthermore, these components are energized to support Unit 1 operation and no design change is required for their normal and alternate power supplies in support of two unit operation. Since the arrangement meets the staff's positions in the SER, the staff finds this response acceptable." Section 8.3.3.3 of SSER22 included, "The NRC staff finds the information provided by TVA regarding isolation of non-Class 1E from Class 1E circuits to be acceptable. The NRC staff requested TVA confirm that, for those circuit breakers that are required to be tested periodically as discussed above, the TRM includes the surveillance requirements for both items 8.3.3.2 and 8.3.3.3. In a letter dated December 6, 2010, TVA stated that the breaker testing requirements are provided in Technical Requirement (TR) 3.8.1 of the WBN Unit 2 TRM. This section of the TRM was originally provided in accordance with a TVA to NRC letter dated March 4, 2009. It was updated in a TVA letter dated February 2, 2010. The NRC staff's review confirmed that necessary circuit breaker testing requirements have been included in Section TR 3.8.1 of the TRM submitted by TVA for Unit 2." Section 8.3.3.4(1) of SSER22 included, "The staff finds the TVA response as acceptable." Section 8.3.3.4(2) of SSER22 included, "The staff finds the TVA response acceptable." Section 8.3.3.5 of SSER22 included, "Based on its review of the information provided by TVA, the NRC staff concludes that TVA has met the requirements of GDC 18 with respect to the onsite ac and dc power system." Section 8.3.3.5.1 of SSER22 included, "The NRC staff reviewed the exceptions to RG 1.9, Revision 3, and concludes that they are not significant to safety and are, therefore, acceptable." Section 8.3.3.5.2 of SSER22 included, "Since TVA has updated the FSAR to reflect that tests will be performed on only one of the four power trains at any one time, the SER item is resolved for WBN Unit 2." Section 8.3.3.6 of SSER22 included, "The NRC staff concludes that TVA continues to meet the requirements of GDC 50 with respect to electrical penetrations containing circuits of the safety and nonsafety onsite power system." SSER22 shows the status for this item as "Resolved."
8.3.4	22	O 06	REVISION 06 UPDATE: Section 8.3.4 of SSER22 included, "The NRC staff concludes that the plant design meets the requirements of GDC 2, 4, 5, 17, 18, and 50 and conforms to the guidance of applicable RGs and NUREG reports, and is, therefore, acceptable, pending resolution of the open items noted in Section 8.3 above." SSER22 shows the status for this item as "Open (NRR)."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
8.4.0	22	CI 06	Station Blackout (SBO) - SE for both units – March 18, 1993; SSE for both units – September 9, 1993. Unit 2 Action: Implement SBO requirements. REVISION 06 UPDATE: Section 8.4.8 of SSER22 (Summary and Conclusions) stated: "Based on the information provided by TVA regarding meeting the requirements of the SBO rule, the NRC staff concludes that TVA's completed and proposed actions, processes, and procedures to address an SBO event are acceptable, pending resolution before WBN Unit 2 startup of the open items noted above in Section 8 of this SSER." SSER22 shows the status for this item as "Open (NRR)."
8.5.0		NA	Area not addressed in 1981 Standard Review Plan.
8.5.1		NA	Area not addressed in 1981 Standard Review Plan.
9.0.0	10	C 01	In SSER10, the staff completed its review of the additional DG building and that review is documented in Sections 9.2.1, 9.4.5, 9.5, 9.5.1, 9.5.4, 9.5.6, 9.5.7 and 9.5.8 of SSER10.
9.1.0	5	C 01	In response to TVA letters requesting relief from the requirement of 10 CFR 70.24 to have a criticality monitor installed in the fuel storage area until irradiated fuel is placed in the area, the staff granted an exemption from the requirement in SSER5.
9.1.1	0	C	Approved for both units in SER.
9.1.2	22	C 06	In SSER5, the staff acknowledged notification by TVA of a contract with DOE for DOE to accept spent fuel from WB and stated that they had no more concerns about this issue. In SSER15, the staff reviewed TVA's proposed resolution of the Boraflex degradation issue and found it acceptable. In SSER16, the staff reviewed changes in design basis with respect to placement of fuel assembly, and structural aspects of rack fabrication deficiencies, considering that TVA planned to replace the racks by the first scheduled refueling outage. The staff noted that the replacement racks have approximately the same capacity as the original WB racks. The staff concluded that the proposed changes were acceptable provided that no single rack load exceeded 80% of its original capacity. REVISION 02 UPDATE: The status in SSER21 is Open (NRR).

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 06 UPDATE: Section 9.1.2 includes: "The NRC staff reviewed the description of the spent fuel storage pit in Amendment 100 to the WBN Unit 2 FSAR and compared it with the description in Amendment 8 to the WBN Unit 1 FSAR. The staff found the descriptions to be essentially identical. Based on prior staff evaluation documented in NUREG-0847 and its supplements, the staff's review and acceptance of amendments to the WBN Unit 1 operating license, and the staff's comparison of the WBN Unit 1 FSAR with Amendment 100 to the WBN Unit 2 FSAR, the staff concluded that the spent fuel storage pool conforms to the relevant requirements of GDC 2, 4, 5, 61, and 63 for protection against natural phenomena, missiles, pipe break effects, radiation protection, and monitoring provisions. Therefore, the design of the shared spent fuel storage pool described in Section 9.1.2 of the WBN Unit 2 FSAR is acceptable." SSER22 shows the status for this item as "Resolved."
9.1.3	23	O - — — 07	In SSER11, the staff reviewed TVA's revised commitment regarding testing of spent fuel pool cooling pumps and found it acceptable. As a result of a submittal filed as a petition pursuant to 10 CFR 2.206 regarding spent fuel storage safety issues, the staff reevaluated the spent fuel cooling capability at WB considering the identified issues and concluded that the spent fuel cooling system satisfied the requirements of GDC 44 with regard to transferring heat from the spent fuel to an ultimate heat sink under normal operating and accident conditions in SSER15. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 07 UPDATE: 9.1.3 of SSER23 includes: "The staff reviewed the changes proposed by TVA to the WBN Unit 2 FSAR in its letter dated December 21, 2010, and compared the changes to the spent fuel pool cooling acceptance criteria applied to WBN Unit 1 and the FSAR content requirements of 10 CFR 50.34. The staff found that the design of the SFPCCS is unchanged and remains acceptable, consistent with the conclusions of the staff as documented in the SER and its supplements. Based on its review, the staff concluded that TVA demonstrated that the cooling capability of the existing SFPCCS was adequate for the increased heat load imposed by alternating fuel discharges from WBN Units 1 and 2 under normal operating conditions, as required by GDC 44 and 61. The staff concludes that the proposed description of the design and operation of the spent fuel pool cooling and cleanup system in FSAR Section 9.1.3 adequately supports operation of WBN Unit 2 and is consistent with the requirements of 10 CFR 50.34, and is, therefore, acceptable. Amendment of the FSAR description of the design and operation of the spent fuel pool cooling and cleanup system in FSAR Section 9.1.3 as proposed by TVA in its December 21, 2010, letter to the NRC, is Open Item 60 (Appendix HH)." SSER23 shows the status for this item as "Open (NRR)." Open Item 60 (Appendix HH) reads as follows:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"TVA should amend the FSAR description of the design and operation of the spent fuel pool cooling and cleanup system in FSAR Section 9.1.3 as proposed in its December 21, 2010, letter to the NRC. (Section 9.1.3)"
9.1.4	24	CO 07	LICENSE CONDITION – Control of heavy loads (NUREG-0612) The staff noted in SSER3 that they were reviewing TVA's submittals regarding NUREG-0612 and concluded in SSER13 that the license condition was no longer necessary based on their review of TVA's response to NUREG-0612 guidelines for Phase I in TVA letter dated July 28, 1993. Unit 2 Action: Implement NEI guidance on heavy loads. --- --- REVISION 06 UPDATE: Section 9.1.4 includes: "In Enclosure 1 to its letter dated August 30, 2010 (ADAMS Accession No. ML102510580), TVA described Unit 2 conformance with guidelines for control of heavy loads. TVA stated that WBN Unit 2 would comply with the Phase I guidelines of NUREG-0612 and qualify the Unit 2 polar crane as equivalent to single-failure-proof for reactor vessel head lifts, consistent with the guidelines of NEI 08-05. TVA stated that the method of compliance with Phase I guidelines would be substantially similar to the current Unit 1 program and that a new Section 3.12 will be added to the Unit 2 FSAR that will be materially equivalent to Section 3.12 of the current Unit 1 FSAR. This is Open Item 34 (Appendix HH). Based on the above, the staff concludes that the design and proposed operation of the WBN Unit 2 fuel handling system is acceptable. The descriptions of equipment and operating procedures used for the handling of fuel within the reactor, refueling canal, and shared spent fuel storage facilities included in Section 9.1.4 of Amendment 100 to the WBN Unit 2 FSAR were approved by the NRC staff in the SER. Also, the NRC staff accepted the WBN Unit 1 heavy load handling program based on conformance with the Phase I guidelines of NUREG-0612, as documented in SSER 13 to NUREG-0847, and TVA enhanced the WBN Unit 1 program through implementation of the NEI 08-05 guidelines. Therefore, implementation of a materially equivalent program at WBN Unit 2 and incorporation of the program information in the WBN Unit 2 FSAR is acceptable for fuel and heavy load handling activities associated with the operation of WBN Unit 2." SSER22 shows the status for this item as "Open (NRR)." --- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 34: "Amendment 103 to the Unit 2 FSAR added new Section 3.12 (Control of Heavy Loads). This new section is materially equivalent to Section 3.12 of the Unit 1 UFSAR. Amendment 103 was submitted via TVA to NRC letter dated March 15, 2011, 'Watts Bar Nuclear Plant (WBN) – Unit 2 – Final Safety Analysis Report (FSAR), Amendment 103.'" --- --- REVISION 07 UPDATE: 9.1.4 of SSER24 includes: "The NRC staff verified that, in Amendment 103, dated March 15, 2011, to the Watts Bar Nuclear Plant (WBN) Unit 2 final safety analysis report (FSAR), TVA added Section 3.12, 'Control of Heavy Loads,' that is materially equivalent to Section 3.12 of the current WBN Unit 1 FSAR. Since TVA's method of compliance with the Phase I guidelines of NUREG-0612, 'Control of Heavy Loads at Nuclear Power

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Plants: Resolution of Generic Technical Activity A-36,' issued July 1980, for WBN Unit 2 is substantially similar to the current WBN Unit 1 program, the NRC staff finds TVA's response acceptable. Therefore, Open Item 34 is closed." SSER24 shows the status for this item as "Resolved."
9.1.5		NA	Addressed in 9.1.4.
9.2.0	0	C	Approved for both units in SER.
9.2.1	23	O 07	In SSER9, the staff noted that Amendment 65 indicated that ERCW provided cooling to the instrument room chillers, instead of room coolers and stated that conclusions in the SER and supplements were still valid. In SSER10, the staff reviewed discrepancies between FSAR figures pertaining to the raw cooling water system and its valving and TVA's clarification of these discrepancies, and considered them resolved. In SSER18, the staff concluded that ERCW does not conform to GDC 5 for two-unit operation. Unit 2 Action: Appropriate measures will be taken to ensure that the ERCW system is fully capable of meeting design requirements for two unit operation. --- --- REVISION 07 UPDATE: 9.2.1 of SSER23 includes: "The staff should verify that the ERCW dual unit flow balance confirms that the ERCW pumps meet all specified performance requirements and have sufficient capability to supply all required ERCW normal and accident flows for dual unit operation and accident response, in order to verify that the ERCW pumps meet GDC 5 requirements for two-unit operation. This is Open Item 90 (Appendix HH)." AND "In its response by letter dated April 13, 2011 (ADAMS Accession No. ML11 104A059), TVA stated that the most limiting cooldown analysis to verify compliance with GDC 5 is a LOCA in Unit 2 with a complete loss of ERCW train A equipment as the single failure with a loss of offsite power (LOOP). All ERCW train B equipment is available, including CCS heat exchanger C and two of four ERCW train B pumps. Core decay heat for the accident unit is conservatively held constant. TVA's analysis determined that ERCW train B has sufficient capability, approximately 19 hours after the nonaccident unit enters hot standby, to remove decay heat from both the accident unit and the nonaccident unit. The time to reach cold shutdown for the nonaccident unit is 46 hours after the nonaccident unit is shut down to hot standby. Based on its review of the information provided by TVA in its letter dated April 13, 2011, the staff concludes that the ERCW system is able to support a cold shutdown of the nonaccident unit within 46 hours of a LOCA in the other unit and hot standby in the nonaccident unit, coincident with a single failure and a LOOP. Therefore, the staff concludes that the ERCW system meets the requirements of GDC 5, which requires that sharing of systems that are important to safety will not significantly impair their ability to perform their safety functions, including an orderly shutdown and cooldown of the nonaccident unit. TVA should update the FSAR with information describing how WBN Unit 2 meets GDC 5, as provided in TVA's letter dated April 13, 2011, and as described above. This is Open Item 91 (Appendix HH)." SSER23 shows the status for this item as "Open (NRR)." ---------- Open Item 90 (Appendix HH) reads as follows:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"The NRC staff should verify that the ERCW dual unit flow balance confirms that the ERCW pumps meet all specified performance requirements and have sufficient capability to supply all required ERCW normal and accident flows for dual unit operation and accident response, in order to verify that the ERCW pumps meet GDC 5 requirements for two-unit operation. (Section 9.2.1)" ---------- Open Item 91 (Appendix HH) reads as follows: "TVA should update the FSAR with information describing how WBN Unit 2 meets GDC 5, assuming the worst case single failure and a LOOP, as provided in TVA's letter dated April 13, 2011. (Section 9.2.1)"
9.2.2	23	CI --- 07	CONFIRMATORY ISSUE - relocate component cooling thermal barrier booster pumps above probable maximum flood (PMF) level before receipt of an OL TVA committed to relocate the pumps above PMF level and the staff found this acceptable. Implementation for this issue was resolved for Unit 1 in SSER5 when the staff verified in IR 390/84-20 that the pumps had been relocated. Additionally, IR 390/83-06 and 391/83-05 verified that the 4 booster pumps had been relocated and the construction deficiency reports identifying this issue for both units were closed. Unit 2 Action: Verify relocation of pumps for Unit 2. ---------- ---------- REVISION 07 UPDATE: 9.2.2 of SSER23 includes: "In the SER, the NRC staff stated that TVA committed to relocating the component cooling booster pumps above the probable maximum flood (PMF) level. The staff found this commitment acceptable pending verification that the modifications were completed before loading fuel into the reactor. In SSER 5, dated November 1990, the staff verified that these pumps for Unit 1 had been relocated above PMF level. TVA should confirm, and the NRC staff should verify, that the component cooling booster pumps for Unit 2 are above PMF level. This is Open Item 67 (Appendix HH)." SSER23 shows the status for this item as "Open (NRR)." ---------- Open Item 67 (Appendix HH) reads as follows: "TVA should confirm, and the NRC staff should verify, that the component cooling booster pumps for Unit 2 are above PMF level. (Section 9.2.2)"
9.2.3	22	C --- 06	Approved for both units in SER. ---------- ---------- REVISION 06 UPDATE: Section 9.2.3 includes: "Therefore, the design of the demineralized water makeup system described in Section 9.2.3 of the WBN Unit 2 FSAR is acceptable." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
9.2.4	22	C 06	In SSER9, the staff noted that potable water requirements were incorrectly stated in the SER, but this change did not affect the conclusions reached in the SER. REVISION 06 UPDATE: Section 9.2.4 includes: "Based on its review of the information provided by TVA, the NRC staff concludes that the changes to the potable and sanitary water systems described above are acceptable. Based on the above information and the staff's previous evaluation documented in the SER and its supplements, the staff concludes that the potable and sanitary water systems meet the requirements of GDC 2 for protection against natural phenomena and meet the guidance of RGs 1.26 and 1.29 on seismic and quality group classifications and are, therefore, acceptable." SSER22 shows the status for this item as "Resolved."
9.2.5	23	O 07	Approved for both units in SER. REVISION 07 UPDATE: 9.2.5 of SSER23 includes: "The NRC staff considers the ability to bring the nonaccident unit to cold shutdown within 72 hours to meet "the orderly shutdown and cool down" requirement of GDC-5. Since the minimum available flow from the Tennessee River is well in excess of the ERCW flow requirements, the staff considers the UHS to meet the requirements of GDC 5. TVA should clarify FSAR Section 9.2.5 to add the capability of the UHS to bring the nonaccident unit to cold shutdown within 72 hours. This is Open Item 66 (Appendix HH)." SSER23 shows the status for this item as "Open (NRR)." Open Item 66 (Appendix HH) reads as follows: "TVA should clarify FSAR Section 9.2.5 to add the capability of the UHS to bring the nonaccident unit to cold shutdown within 72 hours. (Section 9.2.5)"
9.2.6	22	C 06	In SSER12, the staff noted that FSAR Amendment 72 revised the reserved amount of condensate for each units auxiliary feedwater system from 2000,000 gallons to 210,000 gallons and that this did not change the conclusions reached in the SER or supplements. REVISION 06 UPDATE: Section 9.2.6 includes: "In SSER 21, issued February 2009, the NRC staff reviewed existing license review topics to determine whether any topics remained open or were resolved for each section of the FSAR. No open topics were identified for FSAR Section 9.2.6, "Condensate Storage Facilities." The staff reviewed proposed changes to FSAR Section 9.2.6 in recent Amendments 95 through 100 and found no proposed changes that would

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			challenge the system design or major changes to the system description that would change the staff's conclusion in the SER. Therefore, the staff finds that the conclusions of the SER remain valid, and that WBN Unit 2 FSAR Section 9.2.6 is acceptable." SSER22 shows the status for this item as "Resolved."
9.3.0	0	C	Approved for both units in SER.
9.3.1	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Page 1-14 of SSER22 has "1" in the "Note" column for this item. Note 1 reads, "In the process of further validating the information in the WBN Unit 2 FSAR, TVA identified minor administrative/typographical changes to sections previously considered Resolved. TVA addressed these changes to the applicable sections in their submittals and clearly indicated them to the staff. The staff has reviewed and confirmed that the changes made are administrative/typographical and do not impact the staff's conclusions as stated in previous SSERs. Based on this review, no additional review is necessary and this section remains Resolved." SSER22 shows the status for this item as "Resolved." ---------- Section 9.3.1 includes: "The NRC staff reviewed proposed changes to Section 9.3.1 in FSAR Amendments 95 through 100 and found no proposed changes to the system description or design that would change the staff's conclusion in the original SER. Based on the NRC staff's review of the compressed air system for compliance with the applicable GDC, RGs, and Branch Technical Positions (BTPs), the staff concludes that the compressed air system meets the requirements of (1) GDC 2 for against natural phenomena, and (2) GDC 5 for sharing of systems and components. Additionally, the system complies with the guidelines of RG 1.26 regarding its quality group and RG 1.29 regarding seismic classification. Therefore, the staff finds that the conclusions of the original SER remain valid, and FSAR Section 9.3.1 is acceptable." SSER22 shows the status for this item as "Resolved."
9.3.2	24	C 07	LICENSE CONDITION – Post-Accident Sampling System In SSER3, the staff identified the criteria from Item II.B.3 in NUREG-0737 that were unresolved in the SER and reviewed TVA responses for these items. The staff stated that the post-accident sampling system met all of the criteria and was acceptable. They also stated that the proposed procedure for estimating the degree of reactor core damage was acceptable on an interim basis and that TVA would be required to provide a final procedure for estimating the degree of core damage before start-up following the first refueling outage. In SSER5, the staff stated that due to the 5 year delay in WB licensing, TVA should commit to submitting the procedure at an earlier date. TVA submitted a final procedure for estimating degree of core damage by letter dated June 10, 1994, and the license condition was deleted in SSER14.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			In SSER16, the staff reviewed TVA's revised emergency plan implementing procedure governing the use of the methodology provided in the June 10, 1994, submittal, and other plant data, for addressing degree of reactor core damage and found the methodology and implementing procedure acceptable. Unit 2 Action: Eliminate requirement for Post-Accident Sampling System in Technical Specifications (Identified as CT in NRC letter dated May 28, 2008). REVISION 02 UPDATE: The status in SSER21 is Open (NRR). Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. Rev. 0 of the Unit 1 TS contained 5.7.2.6, "Post Accident Sampling." Amendment 34 to the Unit 1 TS (approved by the NRC on January 14, 2002) deleted 5.7.2.6, "Post Accident Sampling." The markup for Unit 2 Developmental Revision A noted that Unit 2 had deleted 5.7.2.6, "Post Accident Sampling" also. REVISION 07 UPDATE: 9.3.2 of SSER24 includes: "On the basis of its review of the information provided by TVA in its letter dated April 1, 2011 (ADAMS Accession No. ML110960407), the NRC staff concludes that TVA's responses to the actions required by the NRC staff's safety evaluation of WCAP-14986, Revision 1, are satisfactory. The staff further concludes that it is acceptable for TVA to remove the PASS from WBN Unit 2. Because the WBN Unit 2 design is otherwise substantially the same as the NRC approved WBN Unit 1 design, the WBN Unit 2 process and postaccident sampling system designs are acceptable." SSER24 shows the status for this item as "Resolved."
9.3.3	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Page 1-15 of SSER22 has "3" in the "Note" column for this item. Note 3 reads, "In SSER 21, this issue was identified as 'Resolved.' However, TVA made changes to the Unit 2 FSAR affecting the previous staff conclusions. The staff evaluated the changes and the results are documented in this SSER." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
9.3.4	22	C	Approved for both units in SER.
		06	REVISION 06 UPDATE: Page 1-15 of SSER22 has "3" in the "Note" column for this item. Note 3 reads, "In SSER 21, this issue was identified as 'Resolved.' However, TVA made changes to the Unit 2 FSAR affecting the previous staff conclusions. The staff evaluated the changes and the results are documented in this SSER." SSER22 shows the status for this item as "Resolved."
9.3.8	22	C	
		06	REVISION 06 UPDATE: 9.3.8 stated: "In SSER 21, the NRC staff reviewed existing license review topics to determine whether items remained open or were resolved for each section of the FSAR. The original SER, NUREG-0847, did not include a Section 9.3.8. As a result, SSER 21 did not include a reference to FSAR Section 9.3.8. The heat tracing system is not explicitly covered in the SER; therefore, TVA proposed to describe the system in FSAR Section 9.3.8, "Heat Tracing." The proposed FSAR section for heat tracing includes the purpose of the system and a list of the systems that use heat tracing. TVA does not take credit for heat tracing to maintain the reactor in a safe-shutdown condition or to mitigate the consequences of accidents. The system components were designed as nonseismic, nonsafety-related. In its letter dated February 8, 2008 (ADAMS Accession No. ML080770242, non-publicly available), TVA proposed no significant changes to the heat tracing system. The NRC staff reviewed proposed changes to Section 9.3 in FSAR Amendments 95 through 100. No changes to the heat tracing system were proposed. Based on its review of the heat tracing system as described in Section 9.3.8 of WBN Unit 2 FSAR Amendments 95 through 100, the NRC staff concluded that the section conforms to the guidance in RG 1.151, Revision 1, "Instrument Sensing Lines," issued July 2010, on the relevant requirements to install heat tracing for freeze protection and to prevent boric acid from precipitating out of the fluid. Therefore, the staff concludes that FSAR Section 9.3.8 is acceptable."
9.4.0	0	C	Approved for both units in SER.
9.4.1	22	C	In SSER9, the staff clarified control room isolation after activation of SI signal from either unit, or upon detection of high radiation or smoke concentration in outside air supply stream and stated that conclusions reached in SER and supplements were still valid.
		06	REVISION 06 UPDATE: Section 9.4.1 includes: "Based on the NRC staff's previous evaluation, as documented in NUREG-0847 and its supplements, and

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			on the staff's evaluation of the information provided by TVA in FSAR Amendment 97, the staff concludes that the control room area ventilation system continues to meet the relevant requirements of GDC 2, 4, 19, and 60 with respect to (1) protection against natural phenomena and environmental effects, (2) adequate access and occupancy of the control room under accident conditions, and (3) control of the release of gaseous radioactive effluents to the environment. It also meets the requirements of Item III.D.3.4 of NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980, and continues to meet the guidelines of RG 1.26, RG 1.29, RG 1.78, Revision 1, "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," and BTP ASB 3-1 for (1) the quality group and seismic classification, (2) protection against chlorine release, and (3) high- and moderate-energy pipe breaks. Therefore, the system is acceptable." SSER22 shows the status for this item as "Resolved."
9.4.2	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 9.4.2 includes: "Based on the above and on the NRC staff's previous evaluation, as documented in NUREG-0847 and its supplements, the staff concludes that the fuel handling area ventilation system continues to meet the relevant requirements of GDC 2, 4, 60, and 61 for (1) protection against natural phenomena, (2) environmental effects, (3) control of releases of radioactive materials to the environment, and (4) appropriate containment, confinement, and filtering systems. The staff also concludes that the system continues to meet the guidelines of RGs 1.13, 1.26, 1.29, and 1.117, "Tornado Design Classification," for design of the ventilation system for the spent fuel storage facility, quality group and seismic classification, and the effects against tornado missiles. Therefore, the system is acceptable." SSER22 shows the status for this item as "Resolved."
9.4.3	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 9.4.3 includes: "Based on the NRC staff's previous evaluation, as documented in NUREG-0847 and its supplements, and on the staff's evaluation of the information provided by TVA in FSAR Amendments 92 and 97, the staff concludes that the auxiliary building and radwaste area ventilation system continues to meet the relevant requirements of GDC 2, 4, and 60 for (1) protection against natural phenomena, (2) environmental effects, and (3) control of the release of radioactive materials to the environment. It also continues to meet the guidelines of RGs 1.26, 1.29, and 1.117 on quality group and seismic classification and the effects against tornado missiles. Therefore, the system is acceptable." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
9.4.4	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 9.4.4 includes: "Based on the NRC staff's previous evaluation, as documented in NUREG-0847 and its supplements, and on the staff's evaluation of the information provided by TVA in FSAR Amendment 94, the staff concludes that the turbine building area ventilation system continues to meet the relevant requirements of GDC 2 for protection against natural phenomena and continues to meet the guidelines of RGs 1.26 and 1.29 on quality group and seismic classification. Therefore, the system is acceptable." SSER22 shows the status for this item as "Resolved."
9.4.5	22	C 06	In SSER9, the staff reviewed the design of the additional DG building ventilation system (FSAR Amendment 66 submittal dated May 20, 1991, for both units) and determined that conclusion reached in SER was still valid and design was acceptable. In SSER10, the staff had concerns regarding periodic testing of the ventilation system for the additional DG building; muffler room exhaust fan failure or exhaust blockage; missile protection for the muffler fan exhaust structure; and potential for blockage and turbine missile damage of air intake structures. These were all resolved in SSER10, with the exception of the potential for external blockage of the air intake structure by missile impact. In SSER11 the staff found TVA's response and procedural change to address potential blockage of the air intake structure by missile impact acceptable. TVA stated in a submittal dated July 28, 1993, that they did not plan to place the additional diesel generator in service. In SSER14, the staff clarified statements made in the SER by stating that none of the ventilation systems for the ERCW pumping station was safety related, but the failure of both mechanical equipment room ventilation fans would not prevent operation of any safety related equipment. Thus, the conclusions reached in the SER were still valid, and the systems were still acceptable. In SSER16, the staff reviewed design changes to the DG building ventilation system, since the original design was reviewed, and concluded that the judgments made in the SER and supplements did not change and the system was still acceptable. In SSER19, the staff clarified their statements about the diesel engine room exhaust fans, stating that since the fans automatically start when the DG starts, DG testing results in operation of the diesel engine room exhaust fans. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 06 UPDATE: Section 9.4.5 includes: "Based on the NRC staff's previous evaluation, as documented in NUREG-0847 and its supplements, and on the staff's evaluation of the information provided by TVA in FSAR Amendment 97, the staff concludes that the ESF ventilation system meets the relevant requirements of GDC 2, 4, and 60 for protection against natural phenomena and missiles and continues to meet the guidance of RGs 1.26 and 1.29 for quality group and seismic classification and the effects against tornado missiles. Therefore, the system is acceptable."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Resolved."
9.4.6	22	C 06	REVISION 06 UPDATE: Section 9.4.6 includes: "TVA clarified the FSAR description of the CVI and ABI following an FHA in the auxiliary building or containment during refueling operations. Also, TVA added a description of the containment vent air cleanup units, which filter the containment vent air before it is released into the annulus. The NRC staff reviewed TVA's changes to the FSAR and concludes that the changes are acceptable because the RBPVS operations during various FHA scenarios continue to meet the requirements of GDC 2, 4, 60, and 61 for protection against natural phenomena, environmental effects, and control of releases of radioactive materials to the environment." SSER22 did not provide a status for this item.
9.4.7	22	C 06	REVISION 06 UPDATE: Section 9.4.7 includes: "Based on its review of FSAR Amendment 97 and the staff's previous evaluation, as documented in the SER and its supplements, the NRC staff concludes that the containment air cooling system is acceptable because the system continues to meet the requirements of GDC 2, 4, and 60 for protection against natural phenomena, environmental effects, and control of releases of radioactive materials to the environment." SSER22 did not provide a status for this item.
9.4.8	22	C 06	REVISION 06 UPDATE: Section 9.4.8 includes: "Based on the NRC staff's previous evaluation, as documented in NUREG-0847 and its supplements, and on the staff's evaluation of the information provided by TVA in FSAR Amendment 94, as supplemented by letter dated June 3, 2010, the staff concludes that the CDWE building ECS meets the relevant requirements of GDC 2 and 4 for protection against natural phenomena and environmental effects and missiles and continues to meet the guidelines of RGs 1.26, 1.29, and 1.117 on quality group and seismic classification and the effects against tornado missiles. Therefore, FSAR Section 9.4.8 is acceptable." SSER22 did not provide a status for this item.
9.5.0	10	C 01	In SSER10, the staff reviewed 55 questions previously asked concerning the 4 original DGs for applicability to the additional DG and additional responses from TVA and had no concerns.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
9.5.1	19	C 01	9.5.1.2: OUTSTANDING ISSUE for Fire Protection Program 9.5.1.3: CONFIRMATORY ISSUE – Electrical penetrations documentation 9.5.1.3: LICENSE CONDITION – Fire protection program In SSER10, the staff noted that the fire hazard analysis for the additional DG building would be included in the WB Fire Protection report. The staff reviewed the building design for compliance with BTP 9.5-1, Appendix A and found it in conformance with the BTP. They also asked TVA to verify that the fire fighting systems installed in the DG building meet GDC 3 and stated that TVA's response satisfied their concerns. In SSER18, the staff concluded that the Fire Protection program for Watts Bar conformed to the requirements of 10 CFR 50.48 and was acceptable except for the fire barrier seal program and emergency lighting inside the Reactor Building. Additionally, the staff considered the confirmatory issue involving electrical penetration documentation resolved in SSER18 on the basis of the safety evaluation of the revised Fire Protection program included in Appendix FF of SSER18. In Appendix FF of SSER19, a safety evaluation of the Fire Protection program contains a detailed evaluation of fire barrier penetration seals. The staff concluded that TVA's penetration seal program adequately demonstrates the fire resistive rating of the penetrations, and that they conform to the guidelines of Positions D.1.j and D.3.d of Appendix A to BTP 9.5.1 and were acceptable. The safety evaluation also includes TVA's revised position on emergency lighting, which was found to be acceptable.
9.5.2	21	O 02	LICENSE CONDITION – Performance testing of communications system The staff resolved this license condition in SSER5 based on TVA's letter of March 18, 1985 for both units, which described its testing of communications systems. Unit 2 Action: Perform testing of communication systems on Unit 2. REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
9.5.3	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 9.5.3 includes: "Based on the information provided by TVA, the NRC staff concludes that the illuminance levels for emergency lighting in the MCR, safety-related panels in the MCR, and remote shutdown consoles conform to the guidance given in the 1993 edition of the IESNA Lighting Handbook and NUREG-0700 and are, therefore, acceptable. Based on its review of the information provided by TVA, the NRC staff concludes that (1) the plant lighting systems described in Section 9.5.3 of the WBN Unit 2 FSAR conform to the industry standard IESNA Lighting Handbook, NUREG-0700, and the acceptance criteria of SRP Section 9.5.3, and (2) the systems can perform their safety-related functions. Therefore, the plant lighting systems are acceptable." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
9.5.4	22	C --- 06	9.5.4.1: CONFIRMATORY ISSUE - include required language in operating instruction to ensure no-load and low-load operation is minimized and revise operating procedures to address increased diesel generator load after it has run for an extended period of time at low or no load In SSER5, the staff verified that plant operating procedures had been revised to incorporate requirements that ensure that operational no-load and low-load conditions will not harm the diesel generators. ---------- 9.5.4.1: LICENSE CONDITION – Diesel Generator reliability The staff verified that the modifications necessary to comply with NUREG/CR-0660 had been completed and, as stated above, requirements had been incorporated into operating procedures. Thus, this license condition was resolved in SSER5. ---------- 9.5.4.1: OUTSTANDING ISSUE for staff to complete review to determine if diesel generator auxiliary support systems can perform their design safety functions under all conditions, after receipt of all requested information. In SSER5, the staff resolved the issue of the completeness of its review of the emergency diesel engine lubrication oil system. ---------- 9.5.4.1: OUTSTANDING ISSUE to design skid-mounted piping and components from the day tank to the diesel engine as seismic Category I and to ASME Section III, Class 3 The staff reviewed standards to which emergency diesel engine skid mounted auxiliary system piping and associated components were designed, as well as the testing and inspections to be performed on these systems, as provided in TVA letters dated February 15, 1985, March 18, 1985, and August 30, 1985, and concluded that they were acceptable in SSER5. The staff considered this issue resolved. They stated that this resolution applied to the fuel oil, cooling water, air starting, lubrication, and combustion air intake and exhaust systems (9.5.4.2, 9.5.5, 9.5.6, 9.5.7 and 9.5.8). ---------- 9.5.4.2: CONFIRMATORY ISSUE - provide missile protection for fuel oil storage tank vent lines The staff found TVA's commitment to provide missile protection for the fuel oil storage tank vent lines acceptable and verified that the protection had been installed and considered this issue resolved in SSER5. ---------- In SSER9, the staff stated that the conclusions reached in the SER, SSER3 and SSER5 regarding the EDG auxiliary supports systems applied to the additional EDG. This conclusion applied to sections 9.5.5, 9.5.6, 9.5.7 and 9.5.8, as well. In SSER10, the staff questioned tornado missile protection and seismic requirements for the additional DG fuel oil storage tank fill lines and found TVA's response acceptable. The staff questioned the difference between the design of the fuel oil transfer pump for the additional DG and the design of the DG building storage pumps, and found TVA's explanation and proposed clarification to the FSAR acceptable. TVA stated in a submittal dated July 28, 1993, that they did not plan to place the additional diesel generator in service. In SSER11, the staff noted the revised capacity of the 7-day fuel oil storage tank identified in FSAR Amendment 69 and stated that it still exceeded the amount needed for a 7-day supply and, therefore, did not affect the staff's conclusions reached in the SER or supplements. In SSER12, the staff determined that the fire watch required when routing a hose from a fuel oil delivery vehicle to the DG tank manway openings in the DG building was no longer required based on TVA

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			actions in response to other fire protection requirements. --- --- The status in SSER21 is Open (NRR). --- --- REVISION 06 UPDATE: Page 1-16 of SSER22 has "2" in the "Note" column for this item. Note 2 reads, "During the assessment of the regulatory framework for completion of the project, the staff characterized certain topics as "Open" pending TVA's validation of the information contained in the section. TVA has determined that the information presented in the FSAR remained valid and only identified minor administrative or typographical changes to the section. TVA addressed the changes in their submittals and clearly indicated the changes. The staff reviewed and confirmed that the changes made to the section are administrative/typographical and do not impact its conclusions as stated in previous SSERs. Therefore, no additional review is necessary and the staff considers this section Resolved." SSER22 shows the status for this item as "Resolved."
9.5.5	11	C --- 01	OUTSTANDING ISSUE to design engine cooling water system piping and components for all engines up to the engine interface, including auxiliary skid mounted piping, to ASME Section III, Class 3 The staff reviewed standards to which emergency diesel engine skid mounted auxiliary system piping and associated components were designed, as well as the testing and inspections to be performed on these systems, and concluded that they were acceptable in SSER5. The staff considered this issue resolved. This resolution applies to the fuel oil, cooling water, air starting, lubrication, and combustion air intake and exhaust systems. --- In SSER5, the staff also resolved concerns regarding ambient DG room temperature and its impact on pre-heating DG units, the time period the DG is capable of operating fully loaded without secondary cooling, and the possibility of the cooling water system becoming air bound due to the expansion tank location. In SSER11, the staff noted that FSAR Amendment 70 stated that coolant temperature would be maintained between 125 and 155 degrees F, not the 115 and 125 stated in the SER. They stated that this clarification did not alter the staff's conclusions previously reached in the SER or its supplements.
9.5.6	22	C --- 06	OUTSTANDING ISSUE to design engine air-starting system piping components for all engines up to the engine interface, including auxiliary skid mounted piping, to ASME Section III, Class 3 The staff reviewed standards to which emergency diesel engine skid mounted auxiliary system piping and associated components were designed, as well as the testing and inspections to be performed on these systems, and concluded that they were acceptable in SSER5. The staff considered this issue resolved. This resolution applies to the fuel oil, cooling water, air starting, lubrication, and combustion air intake and exhaust systems. --- In SSER10, the staff questioned protection of the additional DG electrical starting system components from water spray, and whether diesel engine control functions supplied by the air starting system could interfere with the engines' ability to perform its safety function once it has started. TVA stated in a

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			submittal dated July 28, 1993, that they did not plan to place the additional diesel generator in service. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 06 UPDATE: Page 1-16 of SSER22 has "2" in the "Note" column for this item. Note 2 reads, "During the assessment of the regulatory framework for completion of the project, the staff characterized certain topics as "Open" pending TVA's validation of the information contained in the section. TVA has determined that the information presented in the FSAR remained valid and only identified minor administrative or typographical changes to the section. TVA addressed the changes in their submittals and clearly indicated the changes. The staff reviewed and confirmed that the changes made to the section are administrative/typographical and do not impact its conclusions as stated in previous SSERs. Therefore, no additional review is necessary and the staff considers this section Resolved." SSER22 shows the status for this item as "Resolved."
9.5.7	22	C --- 06	OUTSTANDING ISSUE to perform additional modification, or provide justification for acceptability of proposed modification, to ensure lubrication of all wearing parts of the diesel engine either on an interim or continuous basis and to provide a more detailed description of the lubricating oil system and a description of the diesel engine crankcase explosion protection features In response to a staff concern regarding dry diesel engine starting, TVA proposed using the manufacturers' modification and provided justification for its ability to ensure lubrication of all parts of the diesel engine. The staff found this acceptable in SSER3. TVA submittal of March 18, 1985, responded to a staff request to describe the features that protect the diesel engine crankcase from exploding. In SSER5, on the basis of this submittal, the staff concluded that the emergency diesel engine lubrication oil system can perform its safety function and is acceptable. This issue was resolved. OUTSTANDING ISSUE to design standby diesel engine lube oil system piping and components up to the engine interface, including skid mounted piping, to ASME Section III, Class 3 The staff reviewed standards to which emergency diesel engine skid mounted auxiliary system piping and associated components were designed, as well as the testing and inspections to be performed on these systems, and concluded that they were acceptable in SSER5. The staff considered this issue resolved. This resolution applies to the fuel oil, cooling water, air starting, lubrication, and combustion air intake and exhaust systems. In SSER10, the staff questioned the ability to replenish the additional DG lube oil system without interrupting operation of the DG and found TVA's provision to replenish lube oil acceptable. TVA stated in a submittal dated July 28, 1993, that they did not plan to place the additional diesel generator in service. REVISION 02 UPDATE:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			The status in SSER21 is Open (NRR).
			REVISION 06 UPDATE:
			Page 1-16 of SSER22 has "2" in the "Note" column for this item.
			Note 2 reads, "During the assessment of the regulatory framework for completion of the project, the staff characterized certain topics as "Open" pending TVA's validation of the information contained in the section. TVA has determined that the information presented in the FSAR remained valid and only identified minor administrative or typographical changes to the section. TVA addressed the changes in their submittals and clearly indicated the changes. The staff reviewed and confirmed that the changes made to the section are administrative/typographical and do not impact its conclusions as stated in previous SSERs. Therefore, no additional review is necessary and the staff considers this section Resolved."
			SSER22 shows the status for this item as "Resolved."
9.5.8	22	C --- 06	OUTSTANDING ISSUE to design standby diesel engine combustion air intake and exhaust system piping and components up to the engine interface to ASME Section III, Class 3 and recommendations of RG 1.26
			The staff reviewed standards to which emergency diesel engine skid mounted auxiliary system piping and associated components were designed, as well as the testing and inspections to be performed on these systems, and concluded that they were acceptable in SSER5. The staff considered this issue resolved. This resolution applies to the fuel oil, cooling water, air starting, lubrication, and combustion air intake and exhaust systems.
			In SSER10, the staff expressed a concern regarding products of combustion from a fire in the air intake/muffler room, or from the DG exhaust gases, impacting the additional DG or the other DGs. TVA's response addressed the concern. The staff also questioned inspection, surveillance and testing of the DG exhaust system and found the system design adequate to address their concern. In addition, the staff questioned pressure losses through the DG air intake and exhaust systems and determined that their designs were acceptable. TVA stated in a submittal dated July 28, 1993, that they did not plan to place the additional diesel generator in service.
			REVISION 02 UPDATE:
			The status in SSER21 is Open (NRR).
			REVISION 06 UPDATE:
			Page 1-16 of SSER22 has "2" in the "Note" column for this item.
			Note 2 reads, "During the assessment of the regulatory framework for completion of the project, the staff characterized certain topics as "Open" pending TVA's validation of the information contained in the section. TVA has determined that the information presented in the FSAR remained valid and only identified minor administrative or typographical changes to the section. TVA addressed the changes in their submittals and clearly indicated the changes. The staff reviewed and confirmed that the changes made to the section are administrative/typographical and do not impact its conclusions as stated in previous SSERs. Therefore, no additional review is necessary and the staff considers this section Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Resolved."
10.0.0	0	C	Approved for both units in SER.
10.1.0	0	C	Approved for both units in SER.
10.2.0	21	O 02	In SSER5, the staff agreed that the interval between periodic turbine valve testing could be increased for WB from weekly to monthly. REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
10.2.1	22	C 06	In SSER12, the staff reviewed the revised description of the 3 independent overspeed turbine trip systems, consistent with FSAR Amendment 77, and stated that this review did not alter the conclusions reached in the SER and the system remained acceptable. REVISION 06 UPDATE: Section 10.2.1 includes: "The NRC staff reviewed changes that the Tennessee Valley Authority (TVA) made to Section 10.2.1 of the SER in Final Safety Analysis Report (FSAR) Amendments 95 through 100. TVA made no changes that would affect the staff's conclusions in the SER. Based on its review, the NRC staff concludes that the description of the turbine generator system in FSAR Section 10.2.1 continues to conform to the above requirements and guidance, and that the system can perform its function as designed. Therefore, the staff finds the conclusions of the SER to remain valid, and FSAR Section 10.2.1 is acceptable." SSER22 shows the status for this item as "Resolved."
10.2.2	23	C 07	Approved for both units in SER. REVISION 07 UPDATE: 10.2.2 of SSER23 includes: "In summary, the NRC staff concludes that FSAR Amendment 99, Section 10.2.3, is acceptable, because it demonstrated that the WBN Unit 2 turbine disks have met the five acceptance criteria of SRP Section 10.2.3. Meeting these top-level criteria of SRP Section 10.2.3 ensures that the SRP Section 3.5.1.3-related turbine missile analysis will generate acceptable results."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER23 shows the status for this item as "Resolved."
10.3.0	0	C	Approved for both units in SER.
10.3.1	22	C 06	In SSER12, the staff described changes to the MSIV closing signals as a result of changes to the Eagle-21 process protection system. They stated that the conclusions reached in the SER were still valid and the main steam system remained acceptable. In SSER19, the staff evaluated a revision in FSAR Amendment 91 to the closure time of the MSIVs from 5 seconds after receiving a closure signal to 6 seconds and concluded it was acceptable. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 06 UPDATE: Section 10.3.1 includes: "The NRC staff reviewed changes to Section 10.3.1 that TVA made in FSAR Amendments 95 through 100. TVA did not identify any significant changes to the main steam system up to the isolation valves and did not make any changes to the safety function provided by the main steam system up to the isolation valves that would change the staff's conclusion in the SER. Based on its review, the NRC staff concludes that FSAR Section 10.3.1 continues to comply with the applicable GDC, RGs, and BTPs as evaluated in SER, and that the conclusions of the SER remain valid." SSER22 shows the status for this item as "Resolved."
10.3.2	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Page 1-16 of SSER22 has "2" in the "Note" column for this item. Note 2 reads, "During the assessment of the regulatory framework for completion of the project, the staff characterized certain topics as "Open" pending TVA's validation of the information contained in the section. TVA has determined that the information presented in the FSAR remained valid and only identified minor administrative or typographical changes to the section. TVA addressed the changes in their submittals and clearly indicated the changes. The staff reviewed and confirmed that the changes made to the section are administrative/typographical and do not impact its conclusions as stated in previous SSERs. Therefore, no additional review is necessary and the staff considers this section Resolved." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
10.3.3	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 10.3.3 includes: "Based on its review, the NRC staff concludes that the steam and feedwater system materials requirements in WBN Unit 2 FSAR Amendment 95 are consistent with the staff-approved steam and feedwater system materials controls used in WBN Unit 1. Based on its previous evaluation documented in the SER and SSERs, and on its evaluation of FSAR Amendment 95, the NRC staff concludes that the steam and feedwater system materials controls meet the relevant requirements identified in GDC 1 and Section 10.3.6 of NUREG-0800, and are acceptable." SSER22 shows the status for this item as "Resolved."
10.3.4	22	S 06	LICENSE CONDITION – Secondary water chemistry monitoring and control program The staff determined that the secondary water chemistry monitoring and control program was being included in the administrative section of the Technical Specifications and resolved this for Unit 1 in SSER5. Unit 2 Action: Take same action for Unit 2. REVISION 02 UPDATE: Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. Section 5.7.2.13 provides information about the Secondary Water Chemistry Program. REVISION 06 UPDATE: Section 10.3.4 includes: "Based on the NRC staff's review of FSAR Amendments 92 through 99, and because the applicable proposed TS for WBN Unit 2 is the same as that already approved by the staff for Unit 1, the staff concludes that the WBN Unit 2 secondary water chemistry program is acceptable, and that Section 10.3.4 is resolved." SSER22 shows the status for this item as "Resolved."
10.4.0	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
10.4.1	22	C 06	In SSER9, the staff clarified the description of the main condenser and stated that this clarification did not affect the conclusion reached in the SER. REVISION 06 UPDATE: Section 10.4.1 includes: "Based on its review of the FSAR and the information provided by TVA in its letter dated July 31, 2010, the NRC staff concludes that the Unit 2 main condenser design and performance will meet the acceptance criteria established for the Unit 1 main condenser. Therefore, the conclusions of the SER remain valid, and FSAR Section 10.4.1, "Main Condenser," is acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
10.4.2	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 10.4.2 includes: "In reviewing the Unit 2 MCES, the NRC staff compared TVA's Unit 1 analysis to its Unit 2 analysis and reviewed the system using the acceptance criteria in SRP Section 10.4.2. Based on its review of the information provided by TVA, the staff concluded that the MCES analysis for Unit 2 is consistent with the MCES analysis for Unit 1, which was previously approved by the staff. Therefore, the conclusions of the SER remain valid, and FSAR Section 10.4.2 is acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
10.4.3	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 10.4.3 includes: "Based on its review, the NRC staff concludes that the description of the TGSS, design criteria, and design bases provided in FSAR Section 10.4.3 remains consistent with the criteria given in RG 1.26. Therefore, the conclusions of the SER remain valid, and FSAR Section 10.4.3 is acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
10.4.4	22	C 06	In SSER5, the staff concluded that periodic stroking of the turbine bypass system valves may be performed according to plant operating procedures and no Technical Specification was necessary to ensure this testing. REVISION 02 UPDATE:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			The status in SSER21 is Open (NRR).
			REVISION 06 UPDATE: Section 10.4.4 includes: "In SSER 21, the staff reviewed existing license review topics to determine whether the topics remained open or were resolved for each section of the FSAR. No open topics were identified for FSAR Section 10.4.4. The staff reviewed TVA's proposed changes to FSAR Section 10.4.4 in recent Amendments 95 through 100 and found no changes to the design or description of the system that would change the staff's conclusion in the SER. Therefore, the conclusions of the SER remain valid, and FSAR Section 10.4.4 is acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
10.4.5	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 10.4.5 includes: "The NRC staff reviewed the CCW system for compliance with the applicable GDC, RGs, and BTPs and concluded that the CCW system conforms to the requirements of GDC 2 and 4 for protection against natural phenomena and environmental effects due to pipe breaks, and to the guidelines of RG 1.26 and Regulatory Position C.2 of RG 1.29 for the quality group classification and the protection of safety-related systems from failures in nonsafety-related systems. The staff also reviewed TVA's proposed changes to the system in FSAR Amendments 92 through 99 and found no changes that affect the conclusions made by the staff in the SER. Therefore, the conclusions of the original SER remain valid, and FSAR Section 10.4.5, "Condenser Circulating Cooling Water System," is acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
10.4.6	22	S 06	Approved for both units in SER. REVISION 06 UPDATE: Section 10.4.6 includes: "In WBN Unit 2 FSAR Amendments 92 through 99, TVA made changes to the wording and format of Section 10.4.6, which is now titled "Condensate Polishing Demineralizer System." The NRC staff found that changes to the condensate cleanup system (CCS) instrumentation do not affect the staff's conclusion in the SER that the instrumentation and sampling equipment provided is adequate to monitor and control process parameters in accordance with BTP MTEB 5-3. However, the staff notes that the reference to Table 10.3.2, "Feedwater Chemistry Specification," and the table itself have been removed. As a result, the staff can no longer conclude that the CCS is capable of producing feedwater purity in accordance with BTP MTEB 5-3. TVA should provide information to the NRC staff that the CCS will produce feedwater purity in accordance with BTP MTEB 5-3 or, alternatively, provide justification for producing feedwater purity to another acceptable standard. This is Open Item 35 (Appendix HH)."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Open (NRR)." ---------- TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 35: "TVA provided an update to FSAR Section 10.4.6 in Amendment 104."
10.4.7	22	C --- 06	In SSER14, the staff evaluated changes that TVA made in Amendment 82 to the FSAR adding a new feedwater isolation signal and clarifying the isolation signal generated by a reactor trip, and stated that the revisions did not affect the conclusions reached in the SER. The staff also corrected an unrelated error they made in the SER regarding the time for the main feedwater regulation valves to close after receipt of a feedwater isolation signal and stated that the conclusions reached in the SER remained valid. ---------- ---------- REVISION 06 UPDATE: Section 10.4.7 includes: "Based on its review, the NRC staff concludes that the description of the condensate and feedwater systems, design criteria, and design bases in FSAR Section 10.4.7 is consistent with the criteria given in RG 1.26 and complies with the regulatory requirements noted above. Therefore, the conclusions of the SER remain valid, and FSAR Section 10.4.7 is acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
10.4.8	24	C --- 07	Approved for both units in SER. ---------- ---------- REVISION 06 UPDATE: Section 10.4.8 includes: "TVA should provide information to the NRC staff to enable verification that the SGBS meets the requirements and guidance specified in the SER or provide justification that the SGBS meets other standards that demonstrate conformance to GDC 1 and GDC 14. This is Open Item 36 (Appendix HH)." SSER22 shows the status for this item as "Open (NRR)." ---------- TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 36: "Section 2.1.1, Safety Functions, of the SGB System Description Documents N3-15-4002 (Unit 1) and WBN2-15-4002 (Unit 2), state the following: 'The SGB piping downstream of the containment isolation valves and located in the main stream valve vault room shall be TVA Class G. This piping is seismically supported to maintain the pressure boundary. The SGB piping located in the turbine building shall be TVA Class H.' The Unit 1 and Unit 2 SGB flow diagrams, 1, 2-47W801-2, also recognize the same TVA Class G and Class H class breaks located downstream of the safety-related SGB containment isolation valves.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			The SGB flow diagrams and System Description document that TVA Class G and Class H classifications located downstream of the safety-related containment isolation valves are consistent with the data that was deleted in FSAR Section 10.4.8.1, Steam Generator Blowdown System - Design Basis, Item 6 Component and Code listings described above. It is also noted that NRC Quality Group D classification is equivalent to TVA Class G and H classifications as stated in the NUREG 0847 Section 3.2.2, System Quality Group Classification. Therefore, the design requirements in NRC GDC-1, Quality Standards and Records, and NRC GDC-14, Reactor Coolant Pressure Boundary are not challenged. Amendment 104 to the Unit 2 FSAR will revise Table 3.2-2 to note that TVA Class G and H piping within the SGB System exists downstream of the safety-related containment isolation valves." ---------- TVA to NRC letter dated June 3, 2011, submitted Amendment 104 to the Unit 2 FSAR. The cover letter included the following: "In Reference 2 (Enclosure 1, Item 36), TVA committed to update Table 3.2-2 'to note that TVA Class G and H piping within the SGB System exists downstream of the safety-related containment isolation valves.' TVA later discovered that the same information intended to be placed into Table 3.2-2 was already provided in Table 3.2-2a. Therefore, this change to Table 3.2-2 is no longer needed and thus this letter closes the commitment in Reference 2." Reference 2 is the TVA to NRC letter dated April 6, 2011. ---------- ---------- REVISION 07 UPDATE: 10.4.8 of SSER24 includes: "The information provided by TVA is sufficient to demonstrate that the SGBS conforms to GDC 1 and GDC 14. In its letter to the NRC dated June 3, 2011 (ADAMS Accession No. ML11178A155), TVA stated that 'the same information intended to be placed into Table 3.2-2 was already provided in Table 3.2-2a. Therefore, this change to Table 3.2-2 is no longer needed...' The staff verified that Table 3.2-2a, 'Classification of Systems Having Major Design Concerns Related to a Primary Safety Function,' contained the appropriate information. Since the SGBS conforms to GDC 1 and GDC 14, TVA's response is acceptable to the NRC staff, and Open Item 36 is closed." SSER24 shows the status for this item as "Resolved."
10.4.9	24	C --- 07	In SSER14, the staff discussed reductions in auxiliary feedwater pump design-basis flow rates and new minimum flow requirements. They reviewed TVA's reanalysis of design-basis events and concluded that the revised flow rates were acceptable and the conclusions reached in the SER remained valid. ---------- ---------- REVISION 07 UPDATE (FOR SSER23): 10.4.9 of SSER23 includes: "TVA's proposed clarification to the FSAR is acceptable to the NRC staff. Because the CSTs are credited only for the SBO event under 10 CFR 50.63, and TVA does not plan to share CSTs between the units during plant operation, the staff concludes that TVA satisfies GDC 5 regarding the CSTs. Confirmation by the staff of TVA's change to FSAR Section 10.4.9 to reflect TVA's intention to operate with each CST isolated from the other is Open Item 62 (Appendix HH)." SSER23 shows the status for this item as "Open (NRR)." ----------

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Open Item 62 (Appendix HH) reads as follows: "Confirm TVA's change to FSAR Section 10.4.9 to reflect its intention to operate with each CST isolated from the other. (Section 10.4.9)" ---------- 10.4.9 of SSER24 includes: "The staff verified that in WBN Unit 2 FSAR, Amendment 103, dated March 15, 2011, TVA revised the wording in Section 10.4.9 to state that each CST is intended to operate independently in support on one unit, and no credit is taken in the safety analyses for the ability to crosstie the CSTs. Therefore, Open Item 62 is closed." SSER24 shows the status for this item as "Resolved."
10.4.10	22	C 06	---------- ---------- REVISION 06 UPDATE: Section 10.4.10 includes: "There are no regulatory requirements or guidance in RG 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)," or in the SER for the licensee to provide a description of the heater drain and vent system in the FSAR; therefore, the NRC staff finds the omission of this section from the FSAR to be acceptable." SSER22 did not provide a status for this item.
10.4.11	22	C 06	---------- ---------- REVISION 06 UPDATE: Section 10.4.11 includes: "Because the steam generator wet layup system is not used at WBN, the NRC staff did not review FSAR Section 10.4.11." SSER22 did not provide a status for this item.
11.0.0	0	C	Approved for both units in SER.
11.1.0	24	C 07	This item remains open pending closure of 11.4.0 and 11.5.0 ---------- ---------- REVISION 07 UPDATE: 11.1 of SSER24 reads: "In Amendments 92 and 95 to the WBN Unit 2 FSAR, TVA revised the text to several subsections of Section 11.1, "Source Terms." These changes are editorial in nature and do not affect the technical information presented in FSAR Tables 11.1-1–11.1-7. Therefore, these changes did not affect the staff's

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			original safety conclusions and are acceptable." SSER24 shows the status for this item as "Resolved."
11.2.0	24	C 07	In SSER4, the staff evaluated the revised description contained in FSAR Revision 49 and 54 and determined that the conclusions reached in the original SER were not affected by the revisions. In SSER16, the staff superseded its previous review of the liquid waste management system. The staff concluded that TVA had submitted sufficient design information for both Units 1 and 2 liquid waste management system in accordance with 10 CFR 50.34a requirements and that the LWMS for Watts Bar Units 1 and 2 met the acceptance criteria of SRP Section 11.2 and was, therefore, acceptable. REVISION 07 UPDATE: 11.2 of SSER24 reads: "In FSAR Amendment 95, TVA updated the estimated year 2040 population within a 50-mile radius as listed in Table 11.2-6, 'Tennessee River Reaches within 50-Mile Radius Downstream of WBN.' In addition, FSAR Amendment 104 revised FSAR Section 11.2.9.1 to clarify the basis for the population growth factor of 1.24 used in TVA's analysis of doses from public water supplies. These changes did not impact the staff's prior safety conclusion and, therefore, are acceptable. In FSAR Amendments 95 and 100, TVA updated the whole body and organ doses for the maximum exposed individual in each critical age group listed in Table 11.2-7, 'Watts Bar Nuclear Plant Doses from Liquid Effluents for Year 2040,' based on the expected liquid effluent releases from normal operation of WBN Unit 2 (Column 8 of Table 11.2-5). These updates resulted in minor changes to the calculated doses for individual organs and individual age groups. However, the maximum annual total body dose is to the adult (0.72 millirem (mrem)), and the maximum exposed organ is the teen liver (1.00 mrem); both are unchanged. The revised doses are still well within the Appendix I to 10 CFR Part 50 design objectives of 3 mrem to the total body and 10 mrem to any organ. Therefore, these changes did not impact the staff's prior safety conclusion that WBN Unit 2 meets the design criteria for liquid effluent releases in Appendix I to 10 CFR Part 50 and RM 50-2, and, therefore, are acceptable." SSER24 shows the status for this item as "Resolved."
11.3.0	25	C 08	In the SER, the staff identified that the hydrogen and oxygen monitoring system did not meet the acceptance criteria because redundant monitors had not been provided and because the system was not designed to automatically initiate action to mitigate the potential for explosion in the event of high oxygen content. This issue was addressed by Technical Specifications discussed in the original SER and in SSER8 but was later resolved in SSER16. Based upon NRC review of TVA's February 17, 1995, letter (submitted on both dockets), the staff accepted the WBN's system approach of preclusive of gas buildup, as allowed by SRP Section 11.3 guidelines, if TVA submitted an administrative program to satisfy administrative controls for TS 5.7.2.15, "Explosive Gas and Storage Tank Radioactivity Monitoring Program." As stated in TVA's letter dated July 21, 1995, the program would provide for monitoring and control of potential explosive mixtures, limit the concentration of oxygen, and surveillance to ensure that the limits are not exceeded. As a result of an SSER16 review, the staff concluded that the GWMS for Watts Bar Units 1 and 2 met the acceptance criteria of SRP Section 11.3 and was acceptable. REVISION 07 UPDATE: 11.3 of SSER24 reads: "Both TVA's and the staff's calculations indicate that the design objectives in Sections II.A, II.B, and II.C of

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Appendix I to 10 CFR Part 50 are met. However, the calculations do not support a conclusion that the criteria for gaseous effluents in RM 50-2, and thus Section II.D of Appendix I, are met. As noted in SSER Section 11.0 above, TVA has committed to demonstrating compliance with the dose-based criteria in RM 50-2, in lieu of providing a WBN liquid and gaseous effluent systems cost-benefit analysis. Specifically, Table 11.3-3 of this SSER indicates that the calculated maxim organ dose from the operation of two reactor units at the WBN site would be in excess of 18 mrem. This result does not meet Criterion C.1 in RM 50-2 for gaseous effluent releases of 15 mrem per year to the maximally exposed organ 'from all light-water-cooled nuclear power reactors at a site.' Section II.D of Appendix I to 10 CFR Part 50 states, 'In addition to the provisions of paragraphs A, B, and C above, the applicant shall include in the radwaste system all items of reasonably demonstrated technology that, when added to the system sequentially and in order of diminishing cost-benefit return, can for a favorable cost-benefit ratio effect reductions in dose to the population reasonably expected to be within 50 miles of the reactor.' TVA has not provided the analysis required by Section II.D of Appendix I to 10 CFR Part 50. TVA must demonstrate through a cost-benefit analysis that reasonable changes to the design of the WBN gaseous effluent processing systems would not sufficiently reduce the collective dose to the public within a 50-mile radius. Therefore, the staff cannot conclude that the doses to members of the public from effluent releases during the normal operation of WBN will be ALARA. This is Open Item 135 (Appendix HH)."

SSER24 shows the status for this item as "Open (NRR)."

Open Item 135 (Appendix HH) reads as follows:

"TVA has not provided the analysis required by 10 CFR Part 50, Appendix I, subsection II.D. TVA must demonstrate with a cost-benefit analysis that a sufficient reduction in the collective dose to the public within a 50-mile radius would not be achieved by reasonable changes to the design of the WBN gaseous effluent processing systems. (SSER 24, Section 11.3)"

TVA to NRC letter dated July 28, 2011 (ADAMS Accession Number ML11213A261), "Watts Bar Nuclear Plant (WBN) Unit 2 – Results from Cost-Benefit Analysis of Radwaste System Enhancements," included the following:

"The purpose of this letter is to provide a summary of the results of a cost-benefit study of enhancements to the WBN Unit 2 radwaste systems as committed to Reference 1.

Reference 2 Section II.D requires the preparation of a cost-benefit analysis to determine if enhancements to a plant's radwaste system should be incorporated into the plant design as part of applying the as low as reasonably achievable philosophy to normal plant releases of radiation. The cost-benefit analysis was prepared in accordance with the regulatory positions in Reference 3.

The analysis concluded that none of the enhancements evaluated were cost-beneficial and should be added to the WBN Unit 2 design. The enclosure provides the details from the cost-benefit analysis."

See the letter for the References.

REVISION 08 UPDATE:

The Conclusions portion of 11.3 of SSER25 included:

"Based on the NRC staff's evaluation, as documented in SSER 24, and the results of the cost-benefit analysis, the staff concludes that the WBN effluent systems can maintain gaseous releases within the design objectives in 10 CFR Part 50, Appendix I, Sections II.A, II.B, and II.C, and are as low as is reasonably achievable, as required in 10 CFR Part 50, Appendix I, Section II.D. Therefore, Open Item 135 is closed. The results of the cost-benefit analysis required by 10 CFR Part 50, Appendix I, subsection II.D, should be provided in the WBN Unit 2 FSAR. Upon receipt of the updated FSAR, the NRC staff will confirm that the update has been made by TVA. This is Open Item 139 (Appendix HH)."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER25 shows the status for this item as "Resolved."
11.4.0	24	C 07	On the basis of its review in SSER16, the staff found the process control program for Watts Bar acceptable and concluded that the solid waste management system for Watts Bar Unit 1 conformed to the acceptance criteria of SRP Section 11.4 and was, therefore, acceptable. Unit 2 Action: Provide system description and information on QA provisions for Unit 2 Solid Waste Management System and information on the Process Control Program. REVISION 07 UPDATE: 11.4 of SSER24 reads: "The NRC staff reviewed Section 11.5, 'Solid Waste Management System,' of Amendment 101 to the WBN Unit 2 FSAR and compared it to WBN Unit 1 updated FSAR Amendment 8. The staff concluded that no substantive differences between the two units exist in regard to the design and operation of the solid waste management system. WBN Units 1 and 2 share the solid waste management system for WBN. The NRC staff previously documented its review and acceptance of the solid waste management system at WBN Unit 1 in Section 11.4 of both the SER and SSER 16. Because no substantive differences between the two units exist in regard to the design and operation of the solid waste management system, the staff concludes that the solid waste management system at WBN Unit 2 is acceptable." SSER24 shows the status for this item as "Resolved."
11.5.0	24	C 08	In SSER16, the staff updated its review to Amendment 89, and TVA's submittal dated February 17, 1995. The staff concluded that the process and effluent radiological monitoring and sampling system for Watts Bar Unit 1 complied with 10 CFR 20.1302 and GDCs 60, 63, and 64. The staff also concluded that the system design conformed to the guidelines of NUREG-0737, RGs 1.21 and 4.15, and applicable guidelines of RG 1.97 (Rev. 2). Thus, the system met the acceptance criteria of SRP Section 11.5 and was, therefore, acceptable. In SSER20, the staff agreed that TVA did not commit to RG-4.15, Revision 1 as reflected in TVA's July 21, 1995 letter. In that letter, TVA had stated that the radiation monitoring system generally agrees with and satisfies the intent of the RG 4.15 except for specific calibration techniques and frequencies. The staff then reiterated its earlier finding stated in SSER16, Section 11.5.1, that the radiation monitoring system for Watts Bar Unit 1 meets the intent and purpose of RG 4.15, with respect to quality assurance provisions for the system. The staff modified one sentence from SSER16 and then concluded by stating that the other conclusions given in SSER16 continued to be valid. Unit 2 Action: Provide system description and information on QA provisions for the Unit 2 Radiation Monitoring System. REVISION 07 UPDATE: 11.5 of SSER24 reads: "Because no substantive differences between the two units exist in regard to the design and operation of

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			the process and effluent radiological monitoring and sampling system, the NRC staff concludes that the system at WBN Unit 2 meets the requirements in GDC 60, GDC 63, and GDC 64 of Appendix A to 10 CFR Part 50 and the guidelines in RG 1.21, Revision 1; RG 1.97, Revision 2; and the intent and purpose of RG 4.15, Revision 1, and that it is therefore acceptable." SSER24 shows the status for this item as "Resolved." REVISION 08 UPDATE: "TVA to NRC letter dated December 22, 2011 provided response to Instrumentation and Controls Staff Information Requests. The response to item 6 read as follows: 'TVA Response TVA does not publish a system description document for the Radiation Monitoring system. The information requested is contained in TVA design criteria document WB-DC-40-24, 'Radiation Monitoring (Unit 1/Unit 2).' The document was recently revised to reflect the Unit 2 design. Attachment 8 contains TVA design criteria document WB-DC-40-24, 'Radiation Monitoring (Unit 1/Unit 2)," Revision 24, dated November 30, 2011.'"
11.6.0	21	O 02	In SSER8, the staff reviewed the preoperational REMP program provided by letter dated June 14, 1991 (submitted for both dockets) The staff concluded in SSER Section 1.6.1, "Offsite Radiological Monitoring Program," that the Watts Bar preoperational REMP as proposed was adequate to provide baseline data which will assist in verifying radioactivity concentrations and related public exposures during plant operation, and was therefore acceptable. The staff provided a safety evaluation for both units via a September 10, 1991 letter. In SSER16, the staff superseded previous evaluations provided in this section by Sections 11.1 through 11.5 of this supplement, except for the material in Section 11.6.1 of SSER8, which was unaffected by supplement 16. REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
11.7.0	0	OT 01	This item will remain open pending resolution of Item 11.7.2.
11.7.1	21	CI 02	LICENSE CONDITION (6a) - Accident monitoring instrumentation II.F.1 – Noble Gas monitor In SSER5, TVA submitted letter dated April 26, 1985, on the Unit 1 docket which stated that the Unit 2 shield building vent monitor could not be installed by the time Unit 1 fuel load was scheduled in 1985 because of procurement problems. Since the 1985 fuel load was delayed, TVA subsequently committed in letter dated October 11, 1990, that this monitor and its sampler would be operational before fuel was loaded in Unit 1. This commitment eliminated the staff's concern and resolved the proposed License Condition 6a. Also, in SSER5, TVA letter dated November 8, 1983 (submitted on both Unit 1 and Unit 2 dockets) requested an exception to the requirement to monitor pressurized-water reactor steam safety valve discharge and atmospheric steam dump valve discharge to be monitored by high-range noble gas effluent monitors by stating that adequate instrumentation was provided to detect a steam generator tube rupture. The staff disagreed with this approach which resulted in TVA subsequently committing in a letter dated

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			October 11, 1990 (submitted on both dockets) that the required high range noble gas effluent monitor would be operational before fuel load. This commitment resolved the staff's concern and eliminated the need for License Condition 6a. ---------- LICENSE CONDITION (6b) - Accident monitoring instrumentation II.F.1 – Iodine particulate sampling See 7.5.2. In addition, in SSER5, by letter dated April 26, 1985, submitted on the Unit 1 docket, TVA committed to have the capability for continuous collection in place (i.e., procedures and any minor system modifications necessary) before exceeding 5-percent power. The staff evaluated this commitment and found it acceptable. Since 1985 licensing of Watts Bar was delayed, TVA subsequently committed via letter dated January 3, 1991, as discussed in SSER6 that the procedural revision and upgrade of the radiation monitors would be done by Unit 1 fuel load. Thus License Condition 6b was resolved in SSER6. In SSER6, TVA via letter dated January 3, 1991, committed to have the procedural revision and upgrade of the radiation monitors by fuel load. This commitment ensured the plant would have the capability for continuous collection of post accident gaseous effluents by fuel load. ---------- In SSER5, the staff noted that the WBN design did not include a high-range noble gas effluent monitor as described in NUREG-0737, Item II.F.1, Attachment 1, for the auxiliary building vent because the release is diverted to the shield building vent for design-basis accidents. A low-range to high-range radiation monitor is provided in the shield building ventilation stack. By letter dated November 22, 1983, TVA requested an exception to NUREG-0737, Item II.F.1, concerning the installation of high-range noble gas monitors on the auxiliary building vent at Watts Bar. TVA provided the staff additional information at a meeting on December 20, 1983, and subsequently in a submittal dated January 24, 1984. The staff concluded that the auxiliary building vent was not considered to be a potential accident release pathway and, therefore, the Watts Bar Nuclear Plant design, as described above, does not need to be changed to provide for the addition of a high-range noble gas effluent monitor, as described in NUREG-0737, Item II.F.1, Attachment 1, for the auxiliary building vent. The above items were identified as CI by NRC in May 28, 2008, letter. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection).
11.7.2	16	S --- 02	NUREG-0737, III.D.1.1, "Primary Coolant Outside Containment" - Resolved for Unit 1 only in SSER10; reviewed in Appendix EE of SSER16. Unit 2 Actions: Include the waste gas disposal system in the leakage reduction program and incorporate in Unit 2 Technical Specifications. ---------- In SSER5, TVA by letter dated October 4, 1984, submitted a justification for excluding the waste gas system from the leak reduction program under NUREG-0737, Item III.D.1.1. The staff has evaluated the TVA's submittal and found that sufficient information had not been submitted to provide assurance that significant quantities of radioactive materials would not enter the waste gas system in the event of an accident. On this basis, the staff concluded that the leakage reduction program was acceptable if the following systems were to be included leakage reduction program: (1) residual heat removal, (2) containment

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			spray, (3) safety injection, (4) chemical and volume control, (5) sampling, and (6) waste gas. The staff proposed License Condition 24 and would be resolved if TVA accepted the change as stated above. In SSER6, the staff reviewed TVA's letter dated March 27, 1986, and agreed that TVA had justified excluding the WGDS from the program. In SSER10, the staff resolved Condition 24, when upon review of TVA letter dated August 27, 1992, they noted that WGDS specification was included in the draft TS Section 5.7.2. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS 5.7.2.4 is the Primary Coolant Sources Outside Containment program. This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. This program includes the "Waste Gas" system.
12.0.0	14	C	Approved for both units in SER.
12.1.0	24	C 07	In SSER10, the staff updated its evaluation based upon review of FSAR Amendments 65 through 71 and TVA letter dated January 3, 1991 submitted on U1 docket only. The staff acknowledged that TVA would soon revise FSAR again due to reflect recent changes to 10 CFR Part 20. In SSER14, the staff reviewed the revised FSAR to reflect the 10 CFR Part 20 changes. Details of the staff's review are delineated in the sections that follow. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 07 UPDATE: 12.1 of SSER24 reads: "In Amendments 92, 95, 97, 98, 99, 100, 101, and 104 to the Watts Bar Nuclear Plant (WBN) Unit 2 final safety analysis report (FSAR), the Tennessee Valley Authority (TVA) revised the FSAR principally to conform the WBN Unit 2 design basis to the design basis of WBN Unit 1. The U.S. Nuclear Regulatory Commission (NRC) staff reviewed these amendments against the criteria in Chapter 12, 'Radiation Protection,' of NUREG-0800, 'Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition' (SRP); Item II.B.2, 'Plant Shielding,' of NUREG-0737, 'Clarification of TMI Action Plan Requirements,' issued November 1980; and the staff's conclusions in NUREG-0847, 'Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2,' issued June 1982, as modified by supplemental safety evaluation reports (SSERs) 5, 10, 14, and 18. Shielding is provided to reduce levels of radiation. Ventilation is arranged to control the flow of potentially contaminated air. Radiation monitoring systems are employed to measure levels of radiation in potentially occupied areas and to measure airborne radioactivity throughout the plant. A health physics program is provided for plant personnel and visitors during reactor operation, maintenance, refueling, radioactive waste (radwaste) handling, and inservice inspection. The basis for staff acceptance of the WBN Radiation Protection Program is that doses to personnel will be maintained within the limits of Title

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			10 of the Code of Federal Regulations (10 CFR) Part 20, 'Standards for Protection against Radiation,' and that TVA's radiation protection designs and program features are consistent with the guidelines of Regulatory Guide (RG) 8.8, Revision 3, 'Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable," issued June 1978," SSER24 shows the status for this item as "Resolved."
12.2.0	24	C --- 07	In SSER14, the staff reviewed the revised FSAR discussion of ALARA design and operational considerations in this section that were made to clarify that the total effective dose equivalent for each individual would be maintained ALARA. As revised, FSAR Section 12.1 was consistent with the requirements in 10 CFR 20.1101 and 20.1702 and was, therefore, acceptable to the staff. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 07 UPDATE: 12.2 of SSER24 reads: "In FSAR Amendment 92, dated December 18, 2008, TVA made minor editorial changes to the description of policies and procedures in Section 12.1.3, 'ALARA Operational Considerations.' These changes did not impact the staff's previous safety conclusions in the safety evaluation report (SER) and SSERs and are therefore acceptable." SSER24 shows the status for this item as "Resolved."
12.3.0	24	C --- 07	In SSER14, the staff reviewed the revised FSAR descriptions of the radioactive sources expected to result from normal plant operations, anticipated operational occurrences, and accident conditions. The staff concluded that the descriptions of plant radioactive sources, as revised, conformed to the acceptance criteria in SRP Section 12.2 and were, therefore, acceptable to the staff. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 07 UPDATE: 12.3 of SSER24 includes: "These recalculations did not significantly change the expected overall airborne concentrations in their respective plant areas. The sum of the derived air concentration (DAC) fractions for the lower containment indicates that the expected airborne concentration still exceeds the NRC's definition in 10 CFR Part 20 of an 'airborne radioactivity area,' requiring controls over personnel access consistent with the requirements in Subpart H of 10 CFR Part 20. The total DAC fractions for the upper containment and

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			the instrument room are still each expected to be a fraction of the concentrations that would require controlling them as an airborne radioactivity area. Therefore, these changes did not impact the staff's previous safety conclusion in the SER and SSERs and are therefore acceptable. FSAR Amendment 95 and Amendment 104, dated June 3, 2011, revised Section 12.2.1.3, 'Sources During Refueling,' and Table 12.2-13, 'Irradiated In-Core Detector Drive Wire Sources (MEV/CM-SEC),' to include a description of the in-core instrumentation thimble assemblies (IITAs) as important radioactive sources during refueling operations, replacing the previous discussion of the in-core detector bottom-mounted instrumentation (BMI) thimble tubes. In its letter dated June 3, 2010, which responded to NRC's Request for Additional Information (RAI) 12-1, TVA stated that the IITAs and BMI thimble tubes would be exposed to the same neutron flux during power operations and therefore would exhibit radiation dose rates of similar magnitude. The radiological hazards posed by this source term change should be no greater than previously described. Therefore, these changes did not impact the staff's previous safety conclusion in the SER and SSERs and they are acceptable. In FSAR Amendment 100, dated September 1, 2010, TVA revised the description of the control rods in Section 12.2.1.3 by deleting any reference to boron carbide (B4C). As revised, the FSAR indicates that the reactor control rod absorber material is silver-indium-cadmium, with the radiation source strength listed in Table 12.2-14, 'Irradiated Ag-In-Cd Control Rod Sources.' Because, as indicated in the original FSAR text, B4C is not a significant source of gamma radiation, this change did not impact the staff's previous safety conclusions in the SER and SSERs and it is therefore acceptable." SSER24 shows the status for this item as "Resolved."
12.4.0	24	O --- 07	In SSER10, the staff reviewed revised operational test frequency of area radiation monitors from monthly to quarterly and found that TVA's program met the provisions of 10 CFR 20.1601(c) and the acceptance criteria in SRP Section 12.3 and was, therefore, acceptable. In SSER14, the staff reviewed FSAR Amendment 84 in light of the revised requirements of 10 CFR Part 20. The staff found these sections, as amended, complied with the acceptance criteria in the SRP and was acceptable to the staff. In addition, the staff reviewed revised FSAR Section which specified the radiation dose rate design criteria for the placement and configuration of plant system valves This section as amended was consistent with the staff's conclusion that Watts Bar can be operated within the dose limits and that radiation doses can be maintained ALARA. Therefore, these changes were acceptable to the staff. In SSER18, the staff reviewed FSAR Amendments 89 and 90 in which TVA had revised the discussions of the installed area radiation monitoring and the fixed airborne radiation monitoring systems. In addition, Amendment 90 revised the estimated maximum radiation dose rates depicted on the radiation zone maps for several areas in the plant. The staff also reviewed FSAR text changes that clarified the distinctions between a monitor calibration, a monitor channel operational test, and a check source functional test and deleted discussions of fixed airborne radiation monitors in the Unit 2 hot sample room and the Unit 1 control room and were replaced with portable continuous air monitors (CAMs). The staff found this acceptable since it did not change the staff's conclusion documented in SSER14. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- --- REVISION 07 UPDATE: 12.4 of SSER24 includes: "In FSAR Amendment 97, TVA deleted FSAR Figures 12.3-18 and 12.3-19. These figures contained the drawings of WBN radiation protection design features, including controlled access areas,

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decontamination areas, and onsite laboratories and counting rooms. In lieu of providing drawings depicting these radiation protection design features, TVA provided a description of each. In response to RAI 12-7 regarding the FSAR changes, TVA provided clarifying information in its letters dated June 3 and October 4, 2010. In its October 4, 2010, letter, TVA stated that the WBN Unit 2 access controls to radiological areas (including contaminated areas), personnel and equipment decontamination facilities, onsite laboratories and counting rooms, and health physics facilities (including dosimetry issue, respiratory protection bioassay, and radiation protection management and technical staff) are all common to WBN Unit 1. Furthermore, TVA stated that these facilities are sized and situated properly to support two operating units. Based on TVA's response, the staff concluded that the FSAR changes did not impact the staff's previous safety conclusion, as documented in SSER 18, issued October 1995. Therefore, the changes are acceptable. TVA should provide an update to the FSAR reflecting the radiation protection design features descriptive information provided in its letter dated October 4, 2010. This is Open Item 112 (Appendix HH)."

AND

"In response to a staff RAI, TVA provided a calculation in a letter dated June 3, 2010, that purported to provide a statistical basis for setting the COT frequency for several in-plant area radiation monitors based on the operational maintenance history of WBN Unit 1. Although the NRC staff agrees that actual maintenance history can be used as a basis for establishing the frequency of routine maintenance, the staff identified several deficiencies in the calculations provided by TVA. In a July 25, 2011, meeting, TVA stated that it will revise the FSAR to indicate that the COT frequency for WBN nonsafety-related area radiation monitors will be performed quarterly or periodically at a frequency consistent with monitor operational maintenance history. This alternate frequency will be based on test data from monitors of the same type and model as the WBN Unit 2 monitors, operated under similar environmental conditions (e.g., temperature, humidity). A statistical analysis of these data will establish that, at the COT frequency selected, there is at least a 95-percent probability at a 95-percent confidence level (i.e., less than or equal to a 5-percent Type I error (false alarm) and a 5-percent Type II error (failed alarm), respectively) that each monitor will be found within the established 'as found' acceptance criteria in subsequent tests. TVA should provide an update to the FSAR reflecting the justification for the periodicity of the COT frequency for WBN nonsafety-related area radiation monitors described in this paragraph. This is Open Item 113 (Appendix HH).

In FSAR Amendment 97, TVA added two area radiation monitors to the list of monitors for the spent fuel pit area (0-RE-90-102 and 103) in Table 12.3-4, 'Location of Plant Area Radiation Monitors.' Each monitor uses a Geiger-Mueller type gamma detector, with its own independent high-voltage power supply and a range of 1×10-1 to 1×104 milliroentgen per hour. Visual and audible alarms are provided in the control room upon detection of high radiation or instrument malfunction. In addition, visual and audible alarms are provided that annunciate locally upon detection of high radiation. These two monitors are located on opposite sides of the 757-foot elevation of the auxiliary building and, with the existing area monitors (1-RE-90-1 and 2-RE-90-1), alert personnel in the vicinity of the fuel storage areas of excessive radiation for personnel protection and to initiate safety actions. The staff concludes that WBN meets the radiation monitoring requirements of 10 CFR 50.68, 'Criticality Accident Requirements,' and is therefore acceptable. TVA should update the FSAR to state that WBN meets the radiation monitoring requirements of 10 CFR 50.68. This is Open Item 114 (Appendix HH)."

AND

"These changes to the auxiliary building airborne monitoring reflect the current operational configuration of WBN Unit 1. They do not alter the staff's conclusion in SSER 18 that use of portable continuous airborne monitors is acceptable and that the licensee meets the monitoring requirements in 10 CFR 20.1501, 'General.'"

SSER24 shows the status for this item as "Open (NRR)."

Open Item 112 (Appendix HH) reads as follows:

"TVA should provide an update to the FSAR reflecting the radiation protection design features descriptive information provided in its letter dated October 4, 2010. (SSER 24, Section 12.4)"

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			--- Open Item 113 (Appendix HH) reads as follows: "TVA should provide an update to the FSAR reflecting the justification for the periodicity of the COT frequency for WBN non-safety related area radiation monitors. (SSER 24, Section 12.4)" --- Open Item 114 (Appendix HH) reads as follows: "TVA should update the FSAR to reflect that WBN meets the radiation monitoring requirements of 10 CFR 50.68. (SSER 24, Section 12.4)"
12.5.0	24	O --- 07	In SSER14, the staff reviewed FSAR Amendment 88 which revised the discussion of the estimate of personnel internal exposures to address the new 10 CFR Part 20 requirements. The staff concluded that this section as amended provided reasonable assurance that the requirements of 10 CFR 20.1502 and 20.1703 would be met. In addition, the staff reviewed FSAR Amendment 84 which updated the predicted maximum annual doses resulting from plan operation and determined that this section as amended provides reasonable assurance that the radiation doses resulting from plant operations would not exceed the limits in 10 CFR 20.1301. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- --- REVISION 07 UPDATE: 12.5 of SSER24 includes: "Based on the information provided by TVA in its letter to the NRC dated June 3, 2010, and because historical experience has demonstrated that the average annual collective dose to operate WBN Unit 1 was less than 100 person-rem, the staff concludes that there is reasonable assurance that WBN Unit 2 can be operated at or below 100 person-rem average annual collective dose. Therefore, FSAR Section 12.4 is acceptable. TVA should update the FSAR to reflect the information regarding design changes to be implemented to lower radiation levels, as provided in its letter to the NRC dated June 3, 2010. This is Open Item 115 (Appendix HH)." SSER24 shows the status for this item as "Open (NRR)." --- Open Item 115 (Appendix HH) reads as follows: "TVA should update the FSAR to reflect the information regarding design changes to be implemented to lower radiation levels as provided in its letter the NRC dated June 3, 2010. (SSER 24, Section 12.5)"

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
12.6.0	24	O 07	OUTSTANDING ISSUE involving Health Physics Program The staff reviewed TVA's RADCON program (formerly the HP program) and found that the WBN organizational structure can provide adequate support for the RADCON program and that organizational changes described in the FSAR amendments met the staff's acceptance criteria. They considered this issue resolved in SSER10. In SSER14, the staff reviewed the revised FSAR sections (through Amendment 88), and found them acceptable. REVISION 02 UPDATE: The status in SSER21 is Open (NRR). REVISION 07 UPDATE: 12.6 of SSER24 includes: "In FSAR Amendment 95, TVA made several editorial changes to FSAR Section 12.5 resulting from organizational changes at WBN. With the exception of the following two issues, these did not impact the staff's previous safety conclusion, as documented in SSER 14, issued December 1994, and are therefore acceptable. The remaining two issues are related to the qualifications of the radiation protection manager (RPM). FSAR Section 12.5.1 states that, 'The minimum qualification requirements for the Radiation Protection Manager are stated in Section 13.1.3.' FSAR Section 13.1.3 states that, 'Nuclear Power (NP) personnel at the Watts Bar plant will meet the qualification and training requirements of NRC Regulatory Guide 1.8 with the alternatives as outlined in the Nuclear Quality Assurance Plan, TVA-NQA-PLN89-A.' Specifically, TVA modified its commitment to the personnel qualification standards in RG 1.8, 'Qualification and Training of Personnel for Nuclear Power Plants,' by adding the caveat, 'with the alternatives as outlined in the Nuclear Quality Assurance Plan.' It was unclear to the staff whether or not TVA was committed to (1) the requirement that the RPM have 5 years of 'professional experience' and (2) the 3-month time limit on 'temporarily' assigning an RPM who does not meet the RPM qualifications (ANSI/ANS-3.1-1981, 'Selection, Qualification and Training of Personnel for Nuclear Power Plants,' as referenced in RG 1.8). In response to RAIs 12-13 and 12-14, TVA clarified in its letter to the NRC dated October 4, 2010, that it will meet the requirements of RG 1.8, Revision 2, and ANSI/ANS-3.1-1981 for all new personnel qualifying on positions identified in RG 1.8, Regulatory Position C.1, after January 1, 1990. These changes are consistent with the staff's acceptance criteria 12.5.A of SRP Section 12.5 as they pertain to staff qualifications and are, therefore, acceptable. TVA should update the FSAR to reflect the qualification standards of the RPM as provided in its letter to the NRC dated October 4, 2010. This is Open Item 116 (Appendix HH)." SSER24 shows the status for this item as "Open (NRR)." Open Item 116 (Appendix HH) reads as follows: "TVA should update the FSAR to reflect the qualification standards of the RPM as provided in its letter to the NRC dated October 4, 2010. (SSER 24, Section 12.6)"
12.7.0	24	O 07	Approved for both units in SER. REVISION 07 UPDATE: 12.7 of SSER24 includes:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"In FSAR Amendment 97, TVA revised the list in FSAR Section 12.3.2.2, 'Design Description,' of postaccident activities that require personnel access to vital areas of the plant, adding three and deleting the activities at the postaccident sampling facility. TVA added activities regarding (1) control or verification functions in the motor-generator set room or the 480-volt shutdown board room, or both, (2) installing the component cooling system/essential raw cooling water spool piece, and (3) refilling the refueling water storage tank following a loss-of-coolant accident. Operation of the postaccident sampling system (PASS) was deleted, since emergency operating procedures no longer rely on the results of a primary coolant sample during an accident, and technical specifications no longer require the operability of the PASS. The staff requested information on the dose consequences of the vital missions discussed in Section 12.3.2.2, including plant layout drawings depicting radiation zones during accident conditions and access/egress routes. By letters dated June 3 and December 10, 2010, TVA provided dose calculations and plant layout drawings depicting the access to, and egress from, WBN vital areas. TVA supplemented this information in a letter to the NRC dated February 25, 2011. TVA's commitments to clarify the calculational basis and establish corresponding implementing procedures for access to these vital areas, as stated in its February 25, 2011, letter, are subject to verification by NRC inspection. The staff concludes that TVA has demonstrated, by design calculations, that the actions necessary to mitigate the consequences of a design-basis accident at WBN Unit 2 can be performed such that occupational doses to plant operators are maintained within the dose criteria of GDC 19, as required by NUREG-0737, Item II.B.2. Therefore, the staff concludes that the shielding design for WBN Unit 2 is acceptable. TVA should update the FSAR to reflect the calculational basis for access to vital areas as provided in its letter dated February 25, 2011. This is Open Item 117 (Appendix HH)." SSER24 shows the status for this item as "Open (NRR)." ---------- Open Item 117 (Appendix HH) reads as follows: "TVA should update the FSAR to reflect the calculational basis for access to vital areas as provided in its letter dated February 25, 2011. (SSER 24, Section 12.7.1)"
12.7.1	21	O --- 02	NUREG-0737, II.B.2, "Plant Shielding" - NRC reviewed in Appendix EE of SSER16. In SSER14, the staff reviewed FSAR Amendment 88 which revised the discussion of shielding for accident conditions. The staff stated that this change did not affect the staff's previous conclusion that Watts Bar conformed to the positions in NUREG-0737 Item II.B.2, and was therefore, acceptable to the staff. Identified as CI in NRC letter dated May 28, 2008. Unit 2 Action: Complete Design Review of EQ of equipment for spaces/systems which may be used in post accident operations. CI in NRC May 28, 2008, letter. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
12.7.2	21	O --- 02	NUREG-0737, II.F.1.2.C., "Accident Monitoring Instrumentation" - In SSER5, the staff resolved this license condition for Unit 1 (IR 390/84-09 & IR 390/84-28) due to verification that TVA's commitments regarding the high range in-containment monitor were satisfactory and that it was installed. Identified as CI in NRC letter dated May 28, 2008. Unit 2 Action: Install high range in-containment monitor for Unit 2. CI in NRC May 28, 2008, letter. ----------

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
12.7.3	21	O 02	NUREG-0737, III.D.3.3, "In-plant Monitoring of I2 radiation monitoring" - NRC reviewed in Appendix EE of SSER16. Identified as CI in NRC letter dated May 28, 2008. Unit 2 Action: Complete modifications for Unit 2. CI in NRC May 28, 2008, letter. REVISION 02 UPDATE: The status in SSER21 is Open (NRR).
13.0.0	0	C	Approved for both units in SER.
13.1.0	22	C 06	In SSER16, NRC reviewed the organizational information presented in TVA Topical Report TVA-NPOD89. NRC approval of the topical report and its revisions superseded the staff review in the SER. REVISION 06 UPDATE: Section 13.1 includes: "In the safety evaluation report (SER), the U.S. Nuclear Regulatory Commission (NRC) staff found the organizational structure of the Tennessee Valley Authority (TVA) acceptable. Since then, TVA has revised Section 13.1.1 of the final safety analysis report (FSAR) to state that organizational information is as presented in TVA Topical Report TVA-NPOD89-A, "TVA Nuclear Power Group Organization Description." In Section 13.1 of Supplemental Safety Evaluation Report (SSER) 16, the staff found TVA's organizational structure acceptable based on the staff's approval of TVA Topical Report TVA-NPOD89 and annual updates to the topical report through Revision 6. The staff's approval of the topical report and its updates supersedes the approval given by the staff in the SER. The revision reviewed by the staff in this SSER of TVA-NPOD89-A is Revision 18, issued August 31, 2009." SSER22 shows the status for this item as "Resolved."
13.1.1	0	C	Approved for both units in SER.
13.1.2	0	C	Approved for both units in SER.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
13.1.3	25	C 08	LICENSE CONDITION – Use of experienced personnel during startup In the original 1982 SER, NRC provided a LICENSE CONDITION to ensure TVA augmented the shift staff with individuals that had prior experience with large pressurized water reactor operations. In SSER8, NRC reviewed TVA's commitment in the FSAR and the Nuclear Quality Assurance Plan to comply with RG 1.8, "Personnel Selection and Training,". NRC staff considered that this provided adequate assurance, and eliminated the LICENSE CONDITION. Unit 2 Action: Submit staffing and NQAP for two unit operation. --- --- REVISION 06 UPDATE: Section 13.1.3 includes: "In order to complete its evaluation of TVA's plant staff organization, TVA should provide information to the NRC staff to allow the staff to confirm that: 1) The education and experience of management and principal supervisory positions down through the shift supervisory level conform to RG 1.8. The staff will review the resumes to confirm this. 2) TVA has an adequate number of licensed and non-licensed operators in the training pipeline to support the preoperational test program, fuel loading, and dual unit operation. 3) The plant administrative procedures clearly state that when the Assistant Shift Engineer assumes his duties as Fire Brigade Leader, his control room duties are temporarily assumed by the Shift Supervisor (Shift Engineer), or by another SRO, if one is available. The staff will confirm that the plant administrative procedures clearly describe this transfer of control room duties. These are Open Items 9, 10, and 11 (Appendix HH)." SSER22 shows the status for this item as "Open (NRR)." --- Per TVA letter to NRC dated April 6, 2011, Open Items 9 and 11 are for NRC Inspection / Review. --- --- REVISION 08 UPDATE: 13.1.3 of SSER25 reads: "13.1.3 Plant Staff Organization Disposition of Open Items (Appendix HH) Open Item 11 (Appendix HH) states the following: The plant administrative procedures should clearly state that, when the Assistant Shift Engineer assumes his duties as Fire Brigade Leader, his control room duties are temporarily assumed by the Shift Supervisor (Shift Engineer), or by another SRO [senior reactor operator], if one is available. The plant administrative procedures should clearly describe this transfer of control room duties. In Enclosure 1 of its letter dated August 15, 2011 (Agencywide Documents Access and Management System Accession No. ML11230A385), the Tennessee Valley Authority provided its revised Watts Bar Nuclear Plant Unit 1/Unit 2 as-designed fire protection report. The U.S. Nuclear Regulatory Commission staff reviewed Section 9.1, 'Fire Brigade Staffing,' of the fire protection report and concluded that, because it ensures that the fire brigade will not use members of the minimum shift crew, there is no need

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			for an administrative procedure to describe a transfer of control room duties. Therefore, Open Item 11 is closed. " SSER25 shows the status for this item as "Resolved."
13.2.0	0	C	Approved for both units in SER.
13.2.1	22	C 06	In SSER9, NRC reviewed TVA's certification for licensed operator training programs and FSAR Chapter 13 revision to reflect the training program . NRC determined that these were acceptable. In SSER10, NRC reviewed changes to the initial test program for TMI Item I.G.1, "Training During Low Power Testing." NRC found the training requirement satisfied. REVISION 06 UPDATE: Section 13.2.1 includes: "Based on (1) its review of the information provided by TVA in WBN Unit 2 FSAR Amendment 97 and the staff's previous review as documented in the SER and supplements, (2) the industry accreditation, as described in RG 1.8, of the TVA training programs, and (3) the results of the NRC's periodic examinations of TVA licensed operators and inspections of the training program at WBN Unit 1, the NRC staff finds that TVA's plant staff training program continues to be acceptable." SSER22 shows the status for this item as "Resolved."
13.2.2	0	C	Approved for both units in SER.
13.3.0	13	O 01	In SSER13, NRC reviewed the Watts Bar Nuclear Plant Radiological Emergency Plan submitted February 12, 1993. This review superseded the review in the SER. Unit 2 Action: Submit WBN REP for two unit operation.
13.3.1	22	O 06	In SSER13, NRC reviewed the Watts Bar Nuclear Plant Radiological Emergency Plan submitted February 12, 1993. This review superseded the review in the SER. In SSER20, NRC completed the review including the findings of the Federal Emergency Management Agency. Unit 2 Action: Submit WBN REP for two unit operation. REVISION 06 UPDATE: Section includes: "The objective of the NRC staff review documented here is to determine whether the proposed extension of the existing WBN REP to incorporate Unit 2 has adequately addressed the differences between the two units and any dual-unit issues that arise from the licensing and operation of Unit 2. The NRC will use the results from this review to make its finding, under 10 CFR 50.47(a)(1)(i), that adequate protective measures can and will be taken in a radiological emergency at Unit 2. TVA should evaluate the impact of Unit 2 related changes on the effectiveness of the WBN REP, as it applies to Unit 1, under

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			10 CFR 50.54(q)." SSER22 shows the status for this item as "Open (NRR)."
13.3.2	22	CO --- 08	In SSER13, NRC reviewed the Watts Bar Nuclear Plant Radiological Emergency Plan submitted February 12, 1993. This review superseded the review in the SER. In SSER13, the staff concluded that the WBN Radiological Emergency Plan (REP) provided an adequate planning basis for an acceptable state of onsite emergency preparedness. In SSER20, NRC completed the review and found that the REP complied with NRC requirements and was acceptable for the full-power license of WBN Unit 1. Unit 2 Action: Submit WBN REP for two unit operation. --- --- REVISION 06 UPDATE: Section 13.3.2.18 of SSER22 includes: "Section V of Appendix E to 10 CFR Part 50 requires TVA to submit its detailed implementing procedures for its emergency plan no less than 180 days before the scheduled issuance of an OL. Completion of this requirement is an open item that must be resolved before the issuance of an OL. This is Open Item 43 (Appendix HH)." SSER22 shows the status for this item as "Open (NRR)." --- --- REVISION 08 UPDATE: 13.3.2 of SSER22 includes: "The NRC staff review documented in this SSER used Revision 92 of the NP-REP and the WBN Unit 1/2 version of Appendix C, designated as Revision 92xx. Unless otherwise stated, "WBN REP," as used in this supplement, refers to Revision 92 of the NP-REP and the WBN Unit 1/2 version of Appendix C, Revision 92xx. The staff has identified an open item to review the combined WBN Appendix C before issuance of the Unit 2 OL to confirm (1) that the proposed Unit 2 changes were incorporated into Appendix C and (2) that changes made to Appendix C for Unit 1 since Revision 92 and the changes made to the NP-REP since Revision 92 do not affect the bases of the staff's findings in this SER supplement. This is Open Item 37 (Appendix HH)." and "In its April 27, 2010, response to RAI 6, TVA stated that Unit 1 and Unit 2 will share a common control room, TSC, and OSC and that the Unit 1 communication facilities were originally designed and built to serve both units. As described in SSER 13, TVA's Central Emergency Control Center (CECC), located in Chattanooga, TN, serves as the EOF for Unit 1 and will serve as the EOF for Unit 2. TVA also stated in its response to RAI 7 that the Unit 2 design would provide plant data to the NRC's Emergency Response Data System (ERDS) as is currently done for Unit 1. The staff finds that no dual-unit or unit-specific changes are necessary to reflect Unit 2, in that the communication capabilities were originally designed and built to serve both units. The staff plans to confirm the availability and operability of the ERDS for Unit 2 before issuance of the Unit 2 OL. This is Open Item 38 (Appendix HH). The staff also plans to confirm the adequacy of the communications capability to support dual-unit operations before issuance of the Unit 2 OL. This is Open Item 39 (Appendix HH)." [13.3.2.6] and

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"In its April 27, 2010, response to RAI 8, TVA stated that Unit 1 and Unit 2 will share a common control room, TSC, OSC, and a local recovery center and that the Unit 1 facilities in place were originally designed and built to serve both units. As described in SSER 13, TVA's CECC, located in Chattanooga, TN, serves as the EOF for Unit 1 and will serve as the EOF for Unit 2. No dual-unit or unit-specific changes are necessary to reflect Unit 2, because that the facilities and equipment were originally designed and built to serve both units. The staff should confirm the adequacy of the emergency facilities and equipment to support dual-unit operations before issuance of the Unit 2 OL. This is Open Item 40 (Appendix HH)." [13.3.2.8] and "In its April 27, 2010, response to RAI 9, TVA stated that Unit 1 and Unit 2 will share a common control room, TSC, and OSC and that the Unit 1 facilities in place were originally designed and built to serve both units. As described in SSER 13, TVA's CECC, located in Chattanooga, TN, serves as the EOF for Unit 1 and will serve as the EOF for Unit 2. TVA also committed to (1) updating plant data displays as necessary to include Unit 2 and (2) updating dose assessment models to provide capabilities for assessing releases from both WBN units. The staff plans to confirm the adequacy of these items before issuance of the Unit 2 OL. This is Open Item 41 (Appendix HH)." [13.3.2.9] and "Since these actions are currently in progress, the staff will confirm the adequacy of these assessment capabilities to support dual unit operations before issuance of the Unit 2 OL. This is Open Item 42 (Appendix HH)." [13.3.2.9] --- --- REVISION 08 UPDATE: NRC Inspection Report 391/2011-609 closed SSER (Appendix H) Open Items Number 39 and 42.
13.3.3	22	O 06	LICENSE CONDITION – Emergency Preparedness (NUREG-0737, III.A.1, III.A.2, III.A.2) The NRC review of Emergency Preparedness in SSER13 superseded the review in the original 1982 SER. In SSER13, the staff concluded that the WBN Radiological Emergency Plan (REP) provided an adequate planning basis for an acceptable state of onsite emergency preparedness, and the LICENSE CONDITION was deleted. In SSER20, NRC completed the review and found that the REP complied with NRC requirements and was acceptable for the full-power license of WBN Unit 1. Unit 2 Action: Submit WBN REP for two unit operation. --- --- REVISION 06 UPDATE: Section 13.3.3 includes: "Accordingly, the NRC staff concludes that, pursuant to 10 CFR 50.47(a)(1)(i), and subject to the satisfactory completion of the confirmatory items identified above, there is reasonable assurance that adequate protective measures can and will be taken in a radiological emergency at either WBN Unit 1 or Unit 2." SSER22 shows the status for this item as "Open (NRR)."

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
13.4.0	22	OV --- 06	LICENSE CONDITION - Independent Safety Engineering Group (ISEG) (NUREG-0737, I.B.1.2) In SSER8, NRC indicated that the ISEG would be established as part of the Technical Specifications. Resolved for Unit 1 only in SSER8. Unit 2 action: Implement the alternate ISEG that was approved for the rest of the TVA units including WBN Unit 1 by NRC on August 26, 1999. The function will be performed by the site engineering organizations. --- --- REVISION 06 UPDATE: Section 13.4.0 includes: "TVA's review and audit administrative requirements conform to the applicable guidelines of ANSI N18.7-1976, as endorsed by RG 1.33, Revision 2. The plant review process is consistent with the applicable regulatory guidelines . The NRC staff concludes that the plant review process described in FSAR Section 13.4 and the TVA NQA Plan is consistent with applicable regulatory guidelines, will continue to satisfy the criteria of Appendix B to 10 CFR Part 50, and therefore is acceptable." SSER22 shows the status for this item as "Resolved."
13.5.0	22	C --- 06	Approved for both units in SER. --- --- REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
13.5.1	22	C --- 06	Approved for both units in SER. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- --- REVISION 06 UPDATE: Section 13.5.1 includes: "In 2010, TVA submitted FSAR Amendment 97 for WBN Unit 2. The structure of the section of the report pertaining to administrative procedures has been updated subsequent to the NRC SER, which determined that administrative procedures were acceptable for Unit 1. The portion of the report pertaining to issuance of procedures continues to follow the guidance of RG 1.33, with the updated language referring directly to the guide instead of to the ANSI standard it endorses. The NRC staff concludes that the administrative procedures information presented in FSAR Amendment 97 continues to be in compliance with the requirements of 10 CFR 50.34. The staff also finds that the changes meet the applicable parts of the NUREG-0737, TMI Action Plan Requirements by including administrative procedural provisions in FSAR Section 13.5.1.3. Based on its review of FSAR Amendment 97, and the

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			previous staff evaluation documented in the SER and its supplements, the NRC staff concludes that the administrative procedures meet the relevant requirements of NUREG-0737 and 10 CFR 50.34 and the guidance of the relevant regulatory guides and is therefore acceptable." SSER22 shows the status for this item as "Resolved."
13.5.2	22	CI 06	OUTSTANDING ISSUE involving operating, maintenance and emergency procedures In the original 1982 SER, this issue was used to track the staff's review of the emergency operating procedures generation package. In SSER9, the staff concluded that the outstanding issue was no longer needed as the staff no longer performed such reviews. The emergency operating procedure development program review is performed under IP 42000, "Emergency Operating Procedures." This inspection will be performed before issuance of an operating license. In SSER10, NRC reviewed TVA's plan for vendor review of the power ascension test procedures and the Emergency Operating Instructions (EOIs). Based on the Watts Bar plant specific simulator, NRC determined that a License Condition to ensure consistency with the Sequoyah EOIs was no longer necessary. Unit 2 Action: Issue operating, maintenance and emergency procedures. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). --- --- REVISION 06 UPDATE: Section 13.5.2 includes: "In 2010, TVA submitted FSAR Amendment 97 for WBN Unit 2. The section of the report pertaining to operating and maintenance procedures has been updated in structure. The content of this section satisfies the relevant portions of RG 1.33 and the TMI Action Plan Requirements. This section of the FSAR describes the different classifications of procedures that the operators will use in the control room and locally in the plant for plant operations. As with the administrative procedures, the FSAR describes TVA's program for developing the operating and emergency procedures in the section of the FSAR that follows the guidance of RG 1.33. The FSAR identified the individuals responsible for maintaining the procedures and the general format and content of the operating and maintenance procedures including emergency operating procedures. The different classifications of procedures and maintenance activities were also described. The FSAR addressed the following categories of procedures: • general • system • operating • abnormal • emergency • fuel handling • maintenance • modification The identification of the individuals responsible and the descriptions of the content of the operating and maintenance procedures were in accordance with NUREG-0800. Based on this and the previous staff evaluation documented in the SER and its supplements, the NRC staff concludes that the operating and maintenance procedures are acceptable for WBN Unit 2." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
13.5.3	22	C --- 06	LICENSE CONDITION – Report on outage of emergency core cooling system (NUREG-0737, II.K.3.17) In the original 1982 SER, the NRC accepted TVA's commitment to develop and implement a plan to collect emergency core cooling system outage information. In SSER3, the staff accepted a revised commitment from an October 28, 1983, letter to participate in the nuclear power reliability data system and comply with the requirements of 10 CFR 50.73. ---------- Reporting of Safety Valve and Relief Valve Failures and Challenges (II.K.3.3) In SSER16, NRC reviewed TVA revised commitment to report failures and challenges to PORVs and safety valves in accordance with the Technical Specifications. Unit 2 Action: Include, as necessary, in the Technical Specifications. CT in NRC May 28, 2008, letter. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). ---------- Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. Rev. 0 of the Unit 1 TS contained 5.9.4 (Monthly Operating Reports) which implemented the above commitment for Unit 1. Amendment 57 to the Unit 1 TS (approved by the NRC on March 21, 2005) deleted this section of the TS. The markup for Unit 2 Developmental Revision A noted that Unit 2 will apply this change, and the Unit 2 TS will contain no requirement for Monthly Operating Reports. ---------- ---------- REVISION 06 UPDATE: Section 13.5.3 includes: "By letter dated April 29, 2010, TVA stated that Amendment 57 to the Unit 1 TS removed Section 5.9.4 relating to monthly operating reports. The NRC staff approved this amendment by letter dated March 21, 2005. TVA further stated that the Unit 2 TS will also contain no such requirement and listed this item as "submitted," based on its March 4, 2009, submittal of Developmental Revision A of the WBN Unit 2 TS. ..." "In SSER 21, the NRC staff listed Section 13.5.3 as "Open (Inspection)." Based on the above evaluations, the staff concludes that no inspection is required for items II.K.3.3 and II.K.17, and Section 13.5.3 is resolved." SSER22 shows the status for this item as "Resolved."

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
13.6.0	22	C 06	OUTSTANDING ISSUE to file appropriate revision to the Physical Security Plan In the original 1982 SER, the staff identified certain outstanding issues with TVA's Physical Security Plan. In SSER1 NRC evaluated revisions to the plan submitted July 29, 1982. In SSER15, NRC provided a safety evaluation that concluded that WBN conforms to the requirements of 10 CFR 50.73. ---------- LICENSE CONDITION – Physical security of fuel in containment In SSER1, part of the Physical Security Plan (PSP) was not in accordance with the regulation. TVA submitted a new PSP on June 17, 1992. In SSER10, the staff concluded that the provisions for protection of the containment during major refueling and maintenance met the intent of the regulation. ---------- LICENSE CONDITION - Land Vehicle Bomb Control Program In SSER20, NRC added a license condition for WBN Unit 1 to fully implement the Surface Vehicle Bomb Rule by February 17, 1996. TVA letter to NRC dated February 15, 1996, (submitted for both units) notified NRC that Watts Bar had fully implemented the program. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). ---------- ---------- REVISION 06 UPDATE: Section 13.6.5 (Conclusions) includes: "The NRC staff's review of the WBN Unit 2 PSP, T&QP, and SCP, Revision 11, dated July 23, 2010, and TVA's letter, "Response to Request for Additional Information Regarding Target Set Development," dated November 18, 2010, focused on ensuring that these plans contain the programmatic elements necessary to provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety. Based on its review of the information provided by TVA, the NRC staff concludes that these plans include the necessary programmatic elements that, when effectively implemented, will provide the required high assurance demanded by the regulation. The burden to effectively implement these plans remains with TVA. Effective implementation depends on the procedures and practices that TVA develops to satisfy the programmatic elements of its PSP, T&QP, and SCP." SSER22 shows the status for this item as "Resolved."
13.6.6	24	C 07	---------- ---------- REVISION 07 UPDATE: 13.6.6.3.22 of SSER24 includes: "In its June 10, 2011, submittal, the applicant proposed two license conditions. Each one requested the grant of an operating license, noting that the Security Computer system and relevant EP systems will be implemented to the NEI 08-09 standards described in the CSP by the WBN Unit 1 full implementation date. The staff reviewed the proposed license condition(s) and found them acceptable for the following reasons:

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* The assessment measures taken by the applicant to determine the effectiveness of cyber security protections were based on the NEI 04-04 self assessment criteria. However, this guidance was used by other licensees in the interim period as they moved from their existing cyber security programs towards compliance with 10 CFR 73.54. Furthermore, the applicant addressed the remediation of vulnerabilities discovered during its assessment.

* The interim measures used to protect the applicant's CDAs provide reasonable assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the design-basis threat. As with other licensees, this interim approach is considered adequate until the applicant's CSP is fully implemented.

* The EP systems and the Security Computer (for both WBN Unit 1 and WBN Unit 2) will be fully compliant with 10 CFR 73.54 by the full implementation date provided in the WBN Unit 1 CSP implementation schedule. All other portions of the WBN Unit 2 CSP are scheduled to be implemented prior to the WBN Unit 2 start-up date.

The documented license conditions should be viewed as a full-faith effort on the applicant's part to attain full compliance with the criteria specified in its CSP and to provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the design-basis threat. If full compliance is not met by the date stipulated in the proposed license conditions, the NRC should proceed with a review of the applicant's operating license. Based on the above discussion, the NRC staff proposes the following two license conditions:

Cyber Security Proposed License Condition 1:

The licensee shall implement the requirements of 10 CFR 73.54(a)(1)(ii) as they relate to the security computer. Completion of these actions will occur consistent with the full implementation date of September 30, 2014, as established in the licensee's letter dated April 7, 2011, 'Response to Request for Additional Information Regarding Watts Bar Nuclear Plant Cyber Security Plan License Amendment Request, Cyber Security Plan Implementation Schedule - Watts Bar Nuclear Plant Unit 1.'

Cyber Security Proposed License Condition 2:

The licensee shall implement the requirements of 10 CFR 73.54(a)(1)(iii) as they relate to the corporate based systems that support emergency preparedness. Completion of these actions will occur consistent with the Watts Bar Nuclear Plant Unit 1 implementation schedule established in the licensee's letter dated April 7, 2011, 'Response to Request for Additional Information Regarding Watts Bar Nuclear Plant Cyber Security Plan License Amendment Request, Cyber Security Plan Implementation Schedule - Watts Bar Nuclear Plant Unit 1.' Based on the above and the provided schedule ensuring timely implementation of those protective measures that provide a higher degree of protection against cyber attack, the NRC staff finds the Cyber Security Program implementation schedule is satisfactory."

13.6.6.5 (Conclusion) of SSER24 reads:

"The NRC staff's review and evaluation of the applicant's CSP was conducted using the staff positions established in the relevant sections of RG 5.71. Based on the NRC staff's review, the NRC finds that the applicant addressed the information necessary to satisfy the requirements of 10 CFR 73.54, 10 CFR 73.55(a)(1), 10 CFR 73.55(b)(8), and 10 CFR 73.55(m), and that the applicant's Cyber Security Program provides high assurance that CDAs are adequately protected against cyber attacks, up to and including the design basis threat as described in 10 CFR 73.1. Therefore, the NRC staff finds the information contained in this CSP to be acceptable and upon successful implementation of this program, operation of WBN Unit 2 will not be inimical to the common defense and security."

SSER24 shows the status for this item as "Resolved."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
14.0.0	23	C 07	LICENSE CONDITION – Report changes to Initial Test Program In the original 1982 SER, this LICENSE CONDITION was intended to require TVA report to NRC within 30 days of modifying an approved initial test. In SSER7, the NRC accepted a commitment in TVA's July 1, 1991, letter to notify NRC within 30 days of any changes to the Startup Test Program made under 10 CFR 50.59. Unit 2 Action: Notify NRC within 30 days of any changes to the Startup Test Program made under 10 CFR 50.59. ---------- In SSER3, the staff reviewed additional information and FSAR amendments through 46 addressing concerns identified by the staff in the FSAR. They concluded in SSER3 that the Initial Test Program (ITP), with the exception of open items as a result of modifications made to the program in subsequent amendments (through 53) for which the staff requested additional information, would meet the acceptance criteria of SRP section 14.2 and successful completion of the program would demonstrate functional adequacy of structures, systems and components. In SSER5, the staff reviewed TVA submittals to address the open items from SSER3 and FSAR amendments through 55, and concluded that the program met the acceptance criteria of the SRP and was acceptable. In SSER9, the staff stated that TVA commitments to reinstate the loss-of-offsite-power test for Unit 2 and revise the acceptance criteria for the reactor building purge system air flow rate (TVA letter dated July 10, 1991, for both units) were found acceptable to address two issues identified by the staff during their review of the FSAR through Amendment 67. In SSER10, the staff agreed with TVA that there was no need to perform any natural recirculation test for Units 1 and 2 (See subsection 5.4.3.) In SSER12, the staff evaluated the ITP based on Amendment 74 to the FSAR, which addressed most of the staff's concerns raised during review of Amendment 69, in which the ITP was completely revised. The staff found that Chapter 14, as revised by Amendment 74, was generally adequate and in accordance with review criteria with the exception of 7 items, which would be evaluated in later supplements. In SSER14, the staff evaluated changes made by TVA in Amendments 84 and 86, as well as 5 TVA letters submitted during 1994 to resolve the issues identified by the staff in SSER12, and changes made in FSAR Amendment 88 to address concerns still open prior to that amendment. The staff found that, with the exception of open items that remained open pending receipt and review of TVA's responses, the WB Units 1 and 2 ITP description contained in FSAR Chapter 14, updated through Amendment 88, was generally comprehensive and encompassed the major phases of the program requirements. In SSER16, SSER18 and SSER19, the staff evaluated the ITP through amendments 89, 90 and 91 respectively and stated each time that it found the program to be comprehensive and encompassing the major phases of the testing program guidance presented in the SRP. ---------- A Unit 2 issue to verify capability of each common station service transformer to carry load required to supply ESF loads of 1 unit under LOCA condition in addition to power required for shutdown of non-accident unit was raised in SSER14, and the NRC stated that before an OL can be issued for Unit 2, TVA would have to demonstrate the capability of each CSST to carry the loads of one unit under LOCA conditions in addition to power required for shutting down the non-accident unit. TVA agreed with the NRC position in a January 5, 1995, letter and the issue was resolved in SSER16. Unit 2 Action: Amend FSAR Chapter 14 to reflect the capability of each CSST to carry the loads of one unit under LOCA conditions in addition to power required for shutting down the non-accident unit.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). ---------- Amendment 97 to the Unit 2 FSAR was submitted on January 11, 2010 (ADAMS Accession No. ML100191421) . Table 14.2-1 was revised to clarify the testing requirement. REVISION 05 UPDATE: As a result of the response to NRC RAI 14 - 1, item 6. of Table 14.2-1 was revised again as part of Amendment 100 to the Unit 2 FSAR. Amendment 100 was submitted on September 1, 2010 (ADAMS Accession No. ML102500171). REVISION 07 UPDATE: 14.2.3 (Conclusions) of SSER23 includes: "Section 1.7 of SSER 21 lists FSAR Section 14.0.0 as "Open (Inspection)." The staff performed its review for WBN Unit 2 using the information provided by TVA in FSAR Amendments 97 through 102. Based on its review of the information provided by TVA, as described above, and its previous review, as documented in the SER and its supplements, the staff concludes that the ITP description contained in Chapter 14 of the WBN Unit 2 FSAR, as updated through Amendment 102, is comprehensive and encompasses the major phases of the testing program requirements prescribed by various guidance documents, including the SRP and RG 1.70, Revision 3." SSER23 shows the status for this item as "Resolved."
15.0.0	0	C	Approved for both units in SER.
15.0.1		NA	Area not addressed in 1981 Standard Review Plan.
15.0.2		NA	Area not addressed in 1981 Standard Review Plan.
15.1.0	0	C	Approved for both units in SER.
15.1.1		NA	Addressed in 15.2.1

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
15.1.2		NA	Addressed in 15.2.1
15.1.3		NA	Addressed in 15.2.1
15.1.4		NA	Addressed in 15.2.1
15.1.5		NA	Addressed in 15.2.1 and 15.4.2.
15.2.0	0	S 02	Approved for both units in SER. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel.
15.2.1	24	C 07	In SSER13, NRC reviewed TVA's use of the FACTRAN computer code for LOCA temperature distribution. NRC concluded that the transient analysis was acceptable. In SSER14, NRC approved the trip time delay functional upgrade as part of the Eagle 21 process protection system for low-low steam generator reactor trip. TVA letter dated December 5, 2007, informs NRC of intent to use Eagle-21 for Unit 2. NRC requested additional information December 27, 2007. TVA provided the requested information by letter dated February 28, 2008. By letter dated May 7, 2008, NRC provided a list of specific issues to be addressed in a future amendment application for Eagle-21 for WBN Unit 2. Unit 2 Action: Provide the additional information for NRC review. REVISION 02 UPDATE: TVA responded to the NRC request for additional information on Eagle-21 by letter dated August 25, 2008. REVISION 07 UPDATE: [all portions are from SSER24] The Conclusion portion of 15.2.1.1 (Partial Loss-of-Coolant-Flow Accident) reads: "The NRC staff has reviewed TVA's analyses of the event involving a decrease in reactor coolant flow and concludes that it used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the reactor protection and safety systems will ensure that the SAFDLs and the RCPB pressure limits will not be exceeded as a result of this event. Based on this, the NRC staff concludes that

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			WBN Unit 2 meets the requirements of GDC 10, 15, and 26." ---------- The Conclusion portion of 15.2.1.2 (Loss of External Electrical Load and/or Turbine Trip) reads: "The NRC staff has reviewed TVA's analyses of an event involving the loss of external electrical load or turbine trip, or both, and concludes that it used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the reactor protection and safety systems will ensure that the SAFDLs and the RCPB pressure limits will not be exceeded as a result of this event. Based on this, the NRC staff concludes that WBN Unit 2 meets the requirements of GDC 10, 15, and 26." ---------- The Conclusion portion of 15.2.1.3 (Loss of Normal Feedwater) reads: "The NRC staff has reviewed TVA's analyses of the LONF event and concludes that it used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the reactor protection and safety systems will ensure that the SAFDLs and the RCPB pressure limits will not be exceeded as a result of the LONF flow. Results of the LONF analysis show that the AFW system capacity is such that RCS water is not relieved from the pressurizer relief or safety valves. Therefore, fuel damage is not predicted. Based on this, the NRC staff concludes that WBN Unit 2 meets the requirements of GDC 10, 15, and 26." ---------- 15.2.1.4 (Coincident Loss of Onsite and External (Offsite) AC Power to the Station - Loss of Offsite Power to the Station Auxiliaries) includes: "The regulatory requirements for SBO appear in 10 CFR 50.63, "Loss of All Alternating Current Power." TVA proposed actions for WBN to meet the regulatory requirements of 10 CFR 50.63, and the NRC staff accepted them in safety evaluations in 1993. The conclusions in the staff's 1993 safety evaluations remain valid for WBN Unit 2." SSER24 shows the status for this item as "Resolved."
15.2.2	24	C --- 07	Approved for both units in SER. REVISION 07 UPDATE: [all portions are from SSER24] The Conclusion portion of 15.2.2.1 (Startup of an Inactive Loop at an Incorrect Temperature) reads: "Evaluation of the startup of an inactive loop at an incorrect temperature pertains only to plants that are authorized to operate with a loop out of service. Since WBN Unit 2 is not authorized to operate with a loop out of service, the staff did not evaluate the event." ---------- The Conclusion portion of 15.2.2.2 (Excessive Heat Removal Due to Feedwater System Malfunctions) reads: "The results of TVA's analysis show that the DNBRs calculated for an excessive feedwater addition at power are above the SAL values. Therefore, no fuel or clad damage is predicted. The NRC staff has reviewed TVA's analyses of the events involving excessive heat removal caused by feedwater system malfunctions described above and concludes that it used

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the reactor protection and safety systems will ensure that the SAFDLs and the RCPB pressure limits will not be exceeded as a result of these events. Based on this, the NRC staff concludes that the plant will meet the requirements of GDC 10, 15, 20, and 26." ---------- The Conclusion portion of 15.2.2.3 (Excessive Load Increase Incident) reads: "The NRC staff has reviewed TVA's analyses of the excessive load increase incident and concludes that it used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the SAFDLs and the RCPB pressure limits will not be exceeded as a result of these events. Based on its review, the NRC staff concludes that WBN Unit 2 meets the requirements of GDC 10, 15, 20, and 26." ---------- The Conclusion portion of 15.2.2.4 (Accidental Depressurization of the Main Steam System) includes: "The NRC staff reviewed TVA's evaluation of the accidental depressurization of the main steam system and concludes that TVA's evaluation has been performed using the results of a series of NRC-accepted, and applicable analyses. The NRC staff further concludes that the accidental depressurization of the main steam system will not cause the SAFDLs and the RCPB pressure limits to be exceeded. Based on this, the NRC staff concludes that WBN Unit 2 will meet the requirements of GDCs 10, 15, 20, and 26, in the event of an accidental depressurization of the main steam system. The staff also concludes that the accidental depressurization of the main steam system meets the acceptance criteria for ANS Condition II events, since the limiting steam line break event, the MSLB, also meets the acceptance criteria for ANS Condition II events, as shown by TVA's analysis in FSAR Section 15.4.2 and as evaluated by the NRC staff in Section 15.3.2 of this SSER." The Conclusion at the end of 15.2.2 reads: "The NRC staff has reviewed TVA's evaluation of minor secondary system pipe breaks as provided in FSAR Section 15.3.2, and concludes that TVA's evaluation has been performed using the results of a series of NRC-accepted, and applicable analyses. The NRC staff further concludes that the minor secondary system pipe breaks will not cause the SAFDLs and the RCPB pressure limits to be exceeded. Based on this, the NRC staff concludes that WBN Unit 2 will meet the requirements of GDCs 10, 15, 20, and 26, in the event of a minor secondary system pipe break. The staff also concludes that the minor secondary system pipe breaks meet the acceptance criteria for ANS Condition II events, since the limiting steamline break event, the MSLB, also meets the acceptance criteria for ANS Condition II events, as shown by TVA's analysis in FSAR Section 15.4.2 and as evaluated by the NRC staff in Section 15.3.2 of this SSER." SSER24 shows the status for this item as "Resolved."
15.2.3	24	C --- 07	In SSER18, NRC reviewed FSAR amendment 90. In FSAR amendment 90, TVA revised for the transient event of inadvertent ECCS actuation for both Units. TVA provided additional information for both units by letter dated October 12, 1995. In SSER18, NRC found the reanalysis acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 07 UPDATE: The Conclusion portion of 15.2.3 of SSER 24 reads: "The NRC staff reviewed TVA's analyses of the two mass addition events, the inadvertent operation of ECCS and the CVCS malfunction, and concludes that TVA's analyses used acceptable analytical assumptions and models. The NRC staff further concludes that TVA has demonstrated that the SAFDLs and the RCPB pressure limits will not be exceeded as a result of these events. The staff concludes that TVA has shown that neither of these events could escalate into a more serious event. Based on this, the NRC staff concludes that TVA's analyses show that the requirements of GDC 10, 15, and 26 are met for the WBN Unit 2 inadvertent operation of ECCS and CVCS malfunction events." SSER24 shows the status for this item as "Resolved."
15.2.4	24	O 07	15.2.4.1 Uncontrolled Rod Cluster Assembly Bank Withdrawal from Zero-Power Condition In SSER7, NRC reviewed additional analysis submitted for both units for a two pump, zero power, rod withdrawal. The NRC concluded the revision was acceptable. In SSER13, NRC accepted a change to a limiting condition for operation and bases changes to include a requirement that two reactor coolant pumps should be running whenever rods are capable of withdrawal in Mode 4. Unit 2 Action: Submit Technical Specifications. 15.2.4.4: OUTSTANDING ISSUE for evaluation of Boron dilution and single failure criteria In a letter dated November 2, 1984, TVA stated that the boron dilution alarm system receives signals from two independent channels which are independently powered. Additionally, testing of these circuits was described. The staff concluded in SSER4 that the system is adequately protected from single failure and closed this item. In SSER14, NRC reviewed a reanalysis of the accident associated with uncontrolled boron dilution and accepted the analysis. 15.2.4.6 Rod Cluster Control Assembly Ejection In SSER14, NRC accepted a change to the maximum cladding temperature for the rod ejection accident made in FSAR amendment 80. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS Limiting Condition for Operation 3.4.6 requires two RCS loops with both loops in operation when the rod control system is capable of rod withdrawal. Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010.

* = See last page for status code definition.

Chapter 15 was updated to address the application of RFA-2 fuel.

REVISION 07 UPDATE:

[all portions are from SSER24]

The Conclusion portion of 15.2.4.1 (Uncontrolled Rod Cluster Control Assembly Bank Withdrawal from a Subcritical Condition) reads:

"The NRC staff reviewed TVA's analysis of the RWFS event and concludes that it used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the reactor protection and safety systems will ensure the SAFDLs are not exceeded. Therefore, the NRC staff concludes that WBN Unit 2 will meet the requirements of GDC 10, 20, and 25."

The Conclusion portion of 15.2.4.2 (Uncontrolled Rod Cluster Control Assembly Bank Withdrawal at Power) reads:

"The NRC staff reviewed TVA's analyses of the RWAP event and concludes that it used acceptable analytical models. TVA has shown that the high neutron flux and overtemperature ΔT trip channels provide adequate protection over the entire range of possible reactivity insertion rates (i.e., the minimum value of DNBR is higher than the DNBR SAL for all the analyzed cases). Therefore, the NRC staff concludes that TVA has demonstrated that the reactor protection and safety systems will ensure the SAFDLs are not exceeded. Based on this, the NRC staff concludes that WBN Unit 2 will meet the requirements of GDC 10, 20, and 25."

The Conclusion portion of 15.2.4.3 (Rod Cluster Control Assembly Misalignment) reads:

"The NRC staff has reviewed TVA's analyses of control rod misalignment events and concludes that it used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the reactor protection and safety systems will ensure the SAFDLs will not be exceeded during normal or anticipated operational transients. Based on this, the NRC staff concludes that WBN Unit 2 will meet the requirements of GDC 10, 20, and 25."

The Conclusion portion of 15.2.4.4 (Chemical and Volume Control System Malfunction that Results in a Decrease in Boron Concentration in the Reactor Coolant) reads:

"The NRC staff reviewed TVA's analyses of the decrease in boron concentration in the reactor coolant caused by a CVCS malfunction and concludes that the applicant's analyses used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the reactor protection and safety systems and operator actions will ensure that the SAFDLs and the RCPB pressure limits will not be exceeded as a result of this event, for Modes 1, 2, and 6. Based on this, the NRC staff concludes that the plant will meet the requirements of GDC 10, 15, and 26, in the event of a decrease in boron concentration in the reactor coolant caused by a CVCS malfunction occurring in Modes 1, 2, and 6. The staff did not evaluate B dilution events occurring in Modes 3, 4, and 5 (Open Item 132, Appendix HH)."

The Conclusion portion of 15.2.4.5 (Inadvertent Loading of a Fuel Assembly into an Improper Position) reads:

"The NRC staff has reviewed TVA's analyses of the inadvertent loading of a fuel assembly into an improper position and concludes that it used acceptable analytical models. The NRC staff further

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			concludes that TVA has demonstrated that the reactor protection and safety systems will ensure that the Condition III acceptance criteria will be satisfied. Based on this, the NRC staff concludes that WBN Unit 2 will meet the requirements of GDC 13 and 10 CFR Part 100 in the event of an inadvertent loading of a fuel assembly into an improper position." --- The Conclusion portion of 15.2.4.6 (Single Rod Cluster Control Assembly Withdrawal at Full Power) reads: "The NRC staff reviewed TVA's analyses of the single RCCA withdrawal at full power and concludes that it used acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that the Condition III acceptance criteria will be satisfied. Based on this, the NRC staff concludes that WBN Unit 2 will meet the requirements of GDC 10, 20, and 25, in the event of a single RCCA withdrawal at full power." SSER24 shows the status for this item as "Open (NRR). --- Open Item 132 (Appendix HH) reads as follows: "TVA must provide the NRC staff with analyses of the boron dilution event that meet the criteria of SRP Section 15.4.6, including a description of the methods and procedures used by the operators to identify the dilution path(s) and terminate the dilution, in order for the staff to determine that the analyses comply with GDC 10. (SSER 24, Section 15.2.4.4)"
15.2.5	4	C	Approved for both units in SER subject to completion of Outstanding Issue in 15.2.4.4.
15.2.6		NA	Addressed in 15.2.1.
15.2.7		NA	Addressed in 15.2.1.
15.3.0	0	C	Approved for both units in SER.
15.3.1	24	CO 07	In SSER12, NRC reviewed the reanalysis of small break loss of coolant analysis (SBLOCA) for Units 1 and 2. NRC found the analysis acceptable. In SSER15, NRC reviewed additional changes to the SBLOCA for Units 1 and 2. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- ---

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 07 UPDATE: The Conclusion portion of 15.3.1 of SSER24 reads: "The NRC staff reviewed the large-break LOCA, small-break LOCA, and boric acid precipitation analyses performed by TVA for Watts Bar Unit 2 and concluded that the analyses demonstrate acceptable ECCS performance. Evaluation of boric acid precipitation timing for all break sizes demonstrates that prevention of precipitation is assured, and the EOPs reflect the analysis timing for operator action to align the ECCS for hot and cold side injection to preclude the precipitation. Based on these results, the staff concludes that, for WBN Unit 2 at the power level of 3,479.8 MWt (including a 0.5-percent uncertainty) and a peak linear heat generation rate of 13.89 kilowatt per foot, acceptable ECCS performance is assured for all break sizes and locations. Therefore, the staff concludes that TVA demonstrates compliance for WBN Unit 2 with the requirements set forth in 10 CFR 50.46; 10 CFR Part 50, Appendix K; and GDC 4, 27, and 35." SSER24 shows the status for this item as "Resolved."
15.3.2	24	CO --- 07	In SSER3, NRC reviewed proposed changes to the boron concentration requirement in the Boron Injection Tank and found them acceptable. In SSER14, NRC reviewed TVA application of the new steamline protection feature associated with the Eagle 21 upgrade for WBN Unit 1. The model resulted in the reanalysis of two ruptures: the main feedline and a steamline break outside of containment. Unit 2 Action: Perform analysis. --- Unit 2 Action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: WCAP-13462, "Summary Report Process Protection System Eagle 21 Upgrade, NSLB, MSS and TTD Implementation Watts Bar Units 1 and 2" Revision 2 is applicable to WBN Unit 2. The main feedline and steam line break outside of containment are analyzed in WCAP-13462. NRC has previously reviewed and accepted this analysis for Unit 1 in SSER14. --- Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 07 UPDATE: The Conclusion portion of 15.3.2 of SSER24 reads: "The NRC staff reviewed TVA's analysis of the MSLB for WBN Unit 2, focusing on the Westinghouse MSLB methodology (WCAP-9226-P-A) and on the need to document the subsequent changes to the methodology. TVA's analysis, with respect to the WBN Unit 2 MSLB analysis, mutatis mutandis, is consistent with the approved, generic methodology (WCAP-9226). The NRC staff concludes that TVA performed its analyses using acceptable analytical models and that it has demonstrated that the reactor protection and safety systems will meet the requirements of GDC 27, 28, 31, and 35." SSER24 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
15.3.3	24	CO --- 07	In SSER14, NRC reviewed TVA application of the new steamline protection feature associated with the Eagle 21 upgrade for WBN Unit 1. The model resulted in the reanalysis of two ruptures: the main feedline and a steamline break outside of containment. Unit 2 Action: Perform analysis. ---------- Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: WCAP-13462, "Summary Report Process Protection System Eagle 21 Upgrade, NSLB, MSS and TTD Implementation Watts Bar Units 1 and 2" Revision 2 is applicable to WBN Unit 2. The main feedline and steam line break outside of containment are analyzed in WCAP-13462. NRC has previously reviewed and accepted this analysis for Unit 1 in SSER14. ---------- Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. ---------- ---------- REVISION 07 UPDATE: The Conclusion portion of 15.3.3 of SSER24 reads: "The NRC staff reviewed TVA's analyses of FLB and concludes that it used acceptable analytical models and that it has demonstrated that the RPS and safety systems will ensure that the ability to insert control rods is maintained, the RCPB pressure limits will not be exceeded, the RCPB will behave in a nonbrittle manner, the probability of a propagating fracture of the RCPB is minimized, and abundant core cooling will be provided. Based on its review, the NRC staff concludes that WBN Unit 2 meets the requirements of GDC 27, 28, 31, and 35. Therefore, the NRC staff concludes that TVA's evaluation is acceptable with respect to feedwater system pipe breaks." SSER24 shows the status for this item as "Resolved."
15.3.4	24	CO --- 07	In SSER14, NRC reviewed this section based on VANTAGE 5H fuel and found it acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. ---------- ---------- REVISION 07 UPDATE:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			The Conclusion portion of 15.3.4/15.3.5 of SSER24 reads: "Based on its review of TVA's analyses of the RCP rotor seizure and RCP shaft break, the NRC staff concludes that TVA's analyses adequately model the operation of WBN Unit 2 at the proposed power level and were performed using acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that (1) the RPS will continue to ensure that the ability to insert control rods is maintained, (2) the RCPB pressure limits will not be exceeded, (3) the RCPB will behave in a nonbrittle manner, (4) the probability of a propagating fracture of the RCPB is minimized, and (5) adequate core cooling will be provided. Therefore, the NRC staff concludes that WBN Unit 2 will continue to meet the requirements of GDC 27, 28, and 31 during its proposed operation, and the FSAR is acceptable with respect to the analysis of events caused by a sudden decrease in core coolant flow." SSER24 shows the status for this item as "Resolved."
15.3.5	24	CO --- 07	In SSER14, NRC reviewed this section based on VANTAGE 5H fuel and found it acceptable. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 07 UPDATE: The Conclusion portion of 15.3.4/15.3.5 of SSER24 reads: "Based on its review of TVA's analyses of the RCP rotor seizure and RCP shaft break, the NRC staff concludes that TVA's analyses adequately model the operation of WBN Unit 2 at the proposed power level and were performed using acceptable analytical models. The NRC staff further concludes that TVA has demonstrated that (1) the RPS will continue to ensure that the ability to insert control rods is maintained, (2) the RCPB pressure limits will not be exceeded, (3) the RCPB will behave in a nonbrittle manner, (4) the probability of a propagating fracture of the RCPB is minimized, and (5) adequate core cooling will be provided. Therefore, the NRC staff concludes that WBN Unit 2 will continue to meet the requirements of GDC 27, 28, and 31 during its proposed operation, and the FSAR is acceptable with respect to the analysis of events caused by a sudden decrease in core coolant flow." SSER24 shows the status for this item as "Resolved."
15.3.6	24	C --- 07	LICENSE CONDITION - Anticipated Transients Without Scram (Generic Letter 83-28 Item 4.3) In SSER3, NRC performed an initial review of Generic Letter 83-28 for the Salem anticipated transients without scram events. A new license condition was established for GL 83-28 Item 4.3. In SSER5, the staff found TVA's response to a number of items in GL 83-28 acceptable, including Item 4.3, and thus eliminated this license condition. In a letter dated June 18, 1990, for both units, NRC confirmed that all issues under Item 4.3 were fully resolved. In SSER6, NRC continued the review. In SSER10, NRC completed the review of TVA's submittals for GL 83-28 and found them acceptable. In SSER11, a reference to Item 4.3 that was omitted in SSER10 was added. In SSER12, NRC provided additional information on Items 3.1.3 and 3.2.3. NRC noted that TVA reported that there would be no post maintenance test requirements in the Technical Specifications for either the reactor trip system or other safety related components which could degrade safety. The NRC had no further concerns.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			CI in May 28, 2008, NRC letter. REVISION 02 UPDATE: The status in SSER21 is Open (Inspection). REVISION 07 UPDATE: The Conclusion portion of 15.3.6 of SSER24 reads: "The NRC staff has reviewed the information provided by TVA related to ATWS and concludes that TVA has demonstrated that the AMSAC will meet the requirements of 10 CFR 50.62. Additionally, TVA has demonstrated that the peak RCS pressure following an ATWS event will not exceed the ASME Service Level C acceptance limit (3,200 psig). Therefore, the staff concludes that TVA's analysis of ATWS for WBN Unit 2 is acceptable." SSER24 shows the status for this item as "Resolved."
15.3.7	0	C	Approved for both units in SER.
15.4.0	0	C	Approved for both units in SER.
15.4.1	25	CO 08	In SSER5, NRC reviewed a change to the estimated fractions in leakage pathways for the release of radioactive material following a LOCA. In SSER9, NRC corrected the filter efficiency for organic iodine. The conclusions reached in the SER and supplements remained unchanged. In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. In FSAR amendment 90, TVA increased the amount of leakage that enters the auxiliary building following a LOCA. In SSER18, NRC confirmed this was within the guidelines of 10 CFR Part 100. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. REVISION 08 UPDATE: 15.4.1 of SSER25 includes: "The NRC staff review concluded that the aforementioned unit-specific changes used to evaluate the WBN Unit 2 LOCA analysis are based on physical differences in the units, unit-specific operational

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differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences resulting from a postulated LOCA at the EAB, LPZ, and CR comply with the reference values and the CR dose criterion provided in 10 CFR 100.11, 'Determination of Exclusion Area, Low-Population Zone, and Population Center Distance,' and in 10 CFR Part 50, 'Domestic Licensing of Production and Utilization Facilities,' Appendix A, 'General Design Criteria for Nuclear Power Plants,' General Design Criterion (GDC) 19, 'Control Room,' as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff's review concluded that TVA used analyses, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in Table 15.2 and TVA's calculated dose results in Table 15.1 of this SSER were acceptable. The NRC staff concludes that TVA's estimates of the dose consequences of a design-basis LOCA are in accordance with the SRP acceptance criteria."

SSER25 shows the status for this item as "Resolved."

15.4.2	25	CO --- 08	In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 08 UPDATE: 15.4.2 of SSER25 includes: "Iodine Spike Assumptions For Unit 2, the short-term maximum allowable dose equivalent iodine-131 (DEI) value is 14 microcuries/gram (µCi/gm). TVA has informed the NRC staff (reference Agencywide Documents Access and Management System (ADAMS) Accession No. ML11252A530) that it will submit a license amendment request to revise the Unit 1 technical specification (TS) short-term maximum allowable DEI from 21 µCi/gm to 14 µCi/gm. This change is necessary, since the dose conversion factors (DCFs) were changed from International Commission on Radiological Protection (ICRP)-2, 'Permissible Dose for Internal Radiation,' 1959, values to the values in RG 1.109, 'Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I,' Revision 1, issued October 1977. The Unit 1 TS require that RG 1.109 be used to determine the DEI. With this change, the short-term maximum allowable DEI value of 14 µCi/gm will be consistent for both WBN Unit 1 and Unit 2. The NRC staff has endorsed the use of the DCFs from RG 1.109 in dose consequence analyses." and "The NRC staff review found that the aforementioned unit-specific changes used to evaluate the WBN Unit 2 MSLB analysis are based on physical differences in the units, unit-specific operational differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences resulting from the postulated MSLB at the EAB, LPZ, and CR comply with the reference values and the CR dose criterion provided in 10 CFR 100.11 and 10 CFR Part 50, Appendix A, GDC 19, as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff concluded that TVA used analyses, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Table 15.3 and TVA's calculated dose results given in Table 15.1 of this SSER were acceptable. The NRC staff concluded that TVA's estimates of the dose consequences of a design-basis MSLB are in accordance with the SRP acceptance criteria. " SSER25 shows the status for this item as "Open (NRR)."
15.4.3	25	CO 08	LICENSE CONDITION – Steam Generator tube rupture In SSER2, NRC performed an initial evaluation of an actual Steam Generator Tube Rupture (SGTR) that occurred at Ginna. As part of the Westinghouse Owners Group (WOG), WBN committed to implement all corrective actions recommended by the WOG. In SSER5, NRC reviewed the WOG SGTR analysis and determined that plant specific information was required. In SSER12, the staff identified 5 items that required resolution involving 1) operator action times; 2) radiation offsite consequence analysis; 3) systems, 4) associated components credited for accident mitigation in SG tube rupture emergency operating procedures; and 5) system compatibility with bounding analysis. Items 2-5 were resolved in SSER12. In SSER14, the staff stated that a revised SG tube rupture analysis was more conservative and did not alter the conclusions of their Original safety evaluation. With regard to operator response times, TVA letters dated April 21, 1994, and August 15, 1994, and NRC letter dated June 28, 1994, dealt with simulator runs to address response times and operator performance during simulated SG tube ruptures. The staff concluded, after review of the TVA letters, that the times assumed in the tube rupture analysis were satisfactorily verified and deleted this condition. In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 08 UPDATE: 15.4.3 of SSER25 includes: "The NRC staff review concluded that the aforementioned unit-specific changes used to evaluate the WBN Unit 2 SGTR analysis are based on physical differences in the units, unit-specific operational differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences resulting from the postulated SGTR at the EAB, LPZ, and CR comply with the reference values and the CR dose criterion provided in 10 CFR 100.11 and 10 CFR Part 50, Appendix A, GDC 19, as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff's review found that TVA used analysis, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in Table 15.4 and the TVA's calculated dose results given in Table 15.1 of this SSER were acceptable. The NRC staff concludes that TVA's estimates of the dose consequences of a design-basis SGTR are in accordance with the SRP acceptance criteria." SSER25 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
15.4.4	25	CO --- 08	In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 08 UPDATE: 15.4.4 of SSER25 includes: "The NRC staff evaluated the control rod ejection accident in Section 15.4.4 of the SER (NUREG-0847), and there have been no supplements to this section. The current WBN Unit 2 FSAR Section 15.5, 'Environmental Consequences of Accidents,' does not include a detailed evaluation of this accident except to state that it is bounded by the LOCA. The LOCA dose consequence results for WBN Unit 2 are less than 25 percent of the reference values in 10 CFR 100.11. Since the source term for a control rod ejection accident is considerably less than for a LOCA, and the dose consequence results for the WBN Unit 2 LOCA are less than the SRP acceptance criteria for a rod ejection accident (25 percent of the reference values in 10 CFR 100.11), the staff concludes that the dose consequence for the rod ejection accident will be bounded by the LOCA for WBN Unit 2." SSER25 shows the status for this item as "Resolved."
15.4.5	25	CO --- 08	In SSER4, NRC reevaluated the consequences of a fuel handling accident inside primary containment. NRC concluded WBN met the relevant requirements of GDC 61. In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 08 UPDATE: 15.4.5 of SSER25 includes: 15.4.5.1 "The NRC staff reviewed the unit-specific changes used to evaluate the RG 1.25 WBN Unit 2 FHA analysis and finds that these changes are based on physical differences in the units, unit-specific

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			operational differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences at the EAB, LPZ, and CR resulting from the postulated FHA inside containment, with the containment closed and the RBPVS operating, comply with the reference values and the CR dose criterion provided in 10 CFR 100.11 and 10 CFR Part 50, Appendix A, GDC 19, as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff's review concluded that TVA used analyses, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in Table 15.5 and TVA's calculated dose results given in Table 15.1 of this SSER were acceptable. The NRC staff concludes that TVA's estimates of the dose consequences of a design-basis FHA inside containment with the containment isolated and the RBPVS operating are in accordance with the SRP acceptance criteria." 15.4.5.2 "TVA considered the analysis of the FHA both within the containment and within the auxiliary building. The dropped fuel assembly inside the containment is assumed to occur with the equipment maintenance hatch fully open, and the fuel assembly drop inside the auxiliary building credits no filtration of the exhaust. A minimum water level of 23 feet above the damaged fuel assembly is maintained for release locations both inside containment and the auxiliary building. This minimum water covering acts as a barrier to many of the radionuclides released from the dropped assembly. TVA assumed retention of all noniodine particulates in the pool, while the iodine releases from the fuel gap into the pool are assumed to be decontaminated by an overall factor of 200. This DF results in 0.5 percent (i.e., 99.5 percent of the iodine is retained in the pool) of the radioiodine escaping the overlying water with a composition of 70-percent elemental and 30-percent organic iodine. In accordance with Regulatory Position 3 of RG 1.183, the applicant assumed that 100 percent of the noble gas activity is released from the pool. All fission products released to the environment are assumed to release over a 2-hour period. In the subject RG 1.183 FHA analysis, TVA does not credit dilution within the surrounding structures before release to the atmosphere. These assumptions follow the guidance of RG 1.183 and are, therefore, acceptable to the staff." 15.4.5.3 "TVA evaluated an FHA in the SFP area and in an open containment with no credit taken for the ABGTS or containment purge system filters and concluded that the radiological consequences at the EAB, outer boundary of the LPZ, and CR are within the reference values and the CR dose criterion provided in 10 CFR 50.67, 'Accident Source Term,' as well as the accident-specific dose guidelines specified in SRP Section 15.0.1. The staff's review concluded that TVA used analyses, assumptions, and inputs consistent with the regulatory guidance specified in RG 1.183 for the evaluation of an FHA using the AST. The staff concluded that the assumptions by TVA presented in Table 15.6 of this SSER were acceptable. Table 15.1 of this SSER gives TVA's calculated dose results. The staff concludes that the doses estimated by TVA for the WBN Unit 2 FHA will meet the requirements of 10 CFR 50.67 and the guidelines of RG 1.183 and are, therefore, acceptable." ---------- SSER25 shows the status for this item as "Resolved."
15.4.6	25	CO --- 08	Approved for both units in SER. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. ---------- ----------

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 08 UPDATE: 15.4.6 of SSER25 states: "The NRC staff previously evaluated the failure of small lines carrying coolant outside containment in Section 15.4.6 of the SER (NUREG-0847). There have been no supplements to this section. The current WBN Unit 2 FSAR Section 15.5, 'Environmental Consequences of Accidents,' does not include an evaluation of this accident. In the analysis reviewed in the SER, the primary coolant maximum equilibrium fission product concentration was evaluated at 1.0 µCi/gm DEI. The current WBN Unit 2 TS limit for the primary coolant maximum equilibrium fission product concentration of DEI is 0.265 µCi/gm. Therefore, the analysis reviewed in the SER would be bounding for WBN Unit 2." ---------- SSER25 shows the status for this item as "Resolved."
15.4.7	25	CO --- 08	Approved for both units in SER. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. ---------- ---------- REVISION 08 UPDATE: 15.4.7 of SSER25 includes: "NUREG-0847 does not include an NRC staff review for the radiological dose consequences of a postulated loss of ac power to the plant auxiliaries. For the completion of this SSER, the NRC staff used the CLB assumptions for Unit 1 loss of ac power as a benchmark for acceptability of the Unit 2 analysis and only addressed the following revised Unit 1 parameters and assumptions that are different for Unit 2. " and "Table 15.1 of this SSER shows TVA's calculated gamma and thyroid doses for the loss of ac power to the plant auxiliaries at the EAB and LPZ for both the realistic and conservative analyses. The doses for this accident are well within the limits of 10 CFR 100.11. Table 15.1 presents TVA's estimated whole body and thyroid dose to CR personnel from the radiation sources discussed above. Table 15.9 of this SSER includes parameters for the CR analysis. The whole body dose is below the 10 CFR Part 50, Appendix A, GDC 19 limit of 5 rem for CR personnel, and the thyroid dose is below the 30-rem acceptance criteria stated in SRP Section 6.4, 'Control Room Habitability System,' Revision 3, issued March 2007; therefore, they are acceptable." ---------- SSER25 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
15.4.8	25	C 08	REVISION 08 UPDATE: 15.4.7 of SSER25 includes: "There are no revised Unit 2 parameters for this accident analysis because the waste gas system is common to Units 1 and 2. Therefore, the licensing basis for the proposed Unit 2 analysis is the same as the licensing basis for Unit 1 regarding the environmental consequences of a postulated waste gas decay tank rupture. Since the NRC staff has approved the analysis for Unit 1, it is also acceptable for Unit 2. " --- SSER25 shows the status for this item as "Resolved."
15.5.0	0	C	Approved for both units in SER.
15.5.1	24	C 07	LICENSE CONDITION – Effect of high pressure injection for small beak LOCA with no auxiliary feedwater (NUREG-0737, II.K.2.13) In SSER4, the staff concluded that there was reasonable assurance that vessel integrity would be maintained for small breaks with an extended loss of all feedwater and that the USI A-49, "Pressurized Thermal Shock," review did not have to be completed to support the full-power license. NRC considered this condition resolved. C in NRC May 28, 2008 letter. --- --- REVISION 07 UPDATE: 15.5.1 of SSER24 includes: "As stated in the SER, 'In a submittal dated September 14, 1981, [TVA] committed to the Westinghouse Owners Group generic resolution of this issue.' As stated in SSER 4, 'The staff has completed its review of the WOG submittal for this item, and has concluded that there is reasonable assurance that vessel integrity will be maintained for this type of event. Review of this item will continue under Unresolved Safety Issue (USI) A-49, 'Pressurized Thermal Shock." The NRC resolved USI A-49 by issuing 10 CFR 50.61, 'Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events.' The NRC staff provided regulatory guidance on the issue in Regulatory Guide 1.99, 'Radiation Embrittlement of Reactor Vessel Materials,' and GL 88-11, 'NRC Position on Radiation Embrittlement of Reactor Vessel Materials and Its Impact on Plant Operations,' dated July 12, 1988; and GL 92-01, 'Reactor Vessel Structural Integrity,' Revision 1. The USI was resolved for WBN by a letter from S. Black (NRC) to O.D. Kingsley (TVA) dated June 29, 1989 (ADAMS Accession No. ML082320531), as further documented in SSER 11, Section 5.3.1, 'Reactor Vessel Materials,' issued April 1993, and SSER 14, Section 5.3.1, issued December 1994, which specifically addressed Appendix G, 'Fracture Toughness Requirements,' to 10 CFR Part 50 and GL 92-01. The staff concludes that there are no changes to the acceptance criteria and resolution for WBN Unit 2 from that previously approved and implemented for Unit 1, as documented in the SER and its supplements." SSER24 shows the status for this item as "Resolved."
15.5.2	24	C 07	LICENSE CONDITION – Voiding in the reactor coolant system (NUREG-0737, II.K.2.17) The staff reviewed the generic resolution of this license condition in SSER4 and approved the study in question, thereby resolving this license condition. --- ---

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 07 UPDATE: 15.5.2 of SSER24 includes: "As documented in SSER 4, 'The staff has reviewed and approved the [WOG] study and has determined that no further action needs to be taken by [TVA].' The staff concludes that there are no changes to the acceptance criteria and resolution for WBN Unit 2 from those previously approved and implemented for Unit 1, as documented in the SER and in SSER 4." SSER24 shows the status for this item as "Resolved."
15.5.3	5	C	LICENSE CONDITION – PORV isolation system (NUREG-0737, II.K.3.1, II.K.3.2) NUREG-0737, II.K.3.1, II.K.3.2, "Auto PORV isolation/Report on PORV Failures" - Reviewed in SSER5 and resolved based on NRC conclusion that there is no need for an automatic PORV isolation system (NRC letter dated June 29, 1990). C in NRC May 28, 2008 letter.
15.5.4	24	C 07	"Implementation of TMI Item II.K.3.5 (Automatic Trip of Reactor Coolant Pumps" – Reviewed in 15.5.4 of original 1982 SER; became License Condition 35. The staff determined that their review of Item II.K.3.5 did not have to be completed to support the full power license and considered this license condition resolved in SSER4. The item was further reviewed in Appendix EE of SSER16. CI in NRC May 28, 2008, letter. Unit 2 Action: Implement modifications as required. REVISION 02 UPDATE: Status in SSER21 is Open (Inspection). REVISION 07 UPDATE: 15.5.4 of SSER24 includes: "As noted in Section 15.5.4 of the SER, in its letter to the NRC dated September 14, 1981 (ADAMS Accession No. ML073521447), TVA referenced the WOG generic resolution of this issue, which was progressing on a schedule consistent with the intent of NUREG-0737 requirements. As documented in SSER 4, the NRC, in sending GL 83-10c, 'Resolution of TMI Action Item II.K.3.5., 'Automatic Trip of Reactor Coolant Pumps," dated February 8, 1983, to TVA (1) reaffirmed the conformance of small-break LOCA evaluation models with Appendix K to 10 CFR Part 50 for the case of limited RCP operation after a reactor trip and (2) approved the use of these models for determining the preferred RCP trip strategy (automatic trip, manual trip, or no trip).. By letter dated April 22, 1983 (ADAMS Accession No. ML073530315), TVA responded to GL 83-10c. By letter dated June 8, 1990 (ADAMS Accession No. ML073541207), the NRC staff informed TVA that its WBN response to TMI Action Item II.K.3.5 was acceptable. The staff confirmed, in SSER 16, dated September 1995, that TMI Action Item II.K.3.5 is closed for WBN. The staff concludes that there are no changes to the acceptance criteria and resolution for WBN Unit 2 from those previously approved and implemented for Unit 1, as documented in the SER and its supplements." SSER24 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
15.5.5	21	S 02	NUREG-0737, II.K.3.30, "Small Break LOCA Methods" and NUREG-0737, II.K.3.31, "Plant Specific Analysis" – The staff determined that their review of Items II.K.3.30 and II.K.3.31 did not have to be completed to support the full-power license and considered this LICENSE CONDITION resolved in SSER4. In SSER5, the staff further reviewed responses to these items, and concluded that the Units 1 and 2 FSAR methods and analysis met the requirements of II.K.3.30 and II.K.3.31. This item was further reviewed in Appendix EE of SSER16. Both of these items were CI in NRC May 28, 2008, letter. Unit 2 Action: Complete analysis for Unit 2. REVISION 02 UPDATE: Status in SSER21 is Open (Inspection). Unit 2 FSAR Amendment 97 was submitted on January 11, 2010. It documents SBLOCA analysis being performed using the NOTRUMP computer code. Use of the NOTRUMP evaluation model meets the requirements of II.K.3.31.
15.6.0	0	C	Approved for both units in SER.
15.6.1	0	C	Approved for both units in SER.
16.0.0		S 02	Unit 2 Action: Submit Technical Specifications. REVISION 02 UPDATE: Developmental Revision A of the Unit 2 Technical Specifications was submitted on March 4, 2009. Developmental Revision B of the Unit 2 Technical Specifications was submitted on February 2, 2010.
16.1.0		NA	Area not addressed in 1981 Standard Review Plan.
17.0.0	0	C	Approved for both units in SER.
17.1.0	0	C 01	Approved for both units in SER. See 17.3.
17.2.0	0	C 01	Approved for both units in SER. See 17.3.

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
17.3.0	22	C 06	OUTSTANDING ISSUE - QA program The staff reviewed the description of the QA program in SSER2 and stated that they had resolved the list of open items for which the QA program for the operations phase applies with TVA and concluded that the description was in compliance with NRC regulations. The staff reviewed the organization for the QA program and the NQA Plan, and presented their conclusions in SSER5. They concluded that the program was acceptable for the operations phase of Watts Bar. It was noted, however, that Amendment 63 stated that identification of safety related features would be addressed later and the staff left the outstanding issue unresolved. In SSER10, the staff reviewed additional revisions to the QA program and stated that they did not change the staff's conclusions reached in SSER5. In SSER13, the staff concluded that TVA had established appropriate programmatic controls for identification of safety related features and considered this issue resolved. In SSER15, the staff listed additional revisions to the QA program without comment. REVISION 06 UPDATE: Section 17.3 includes: "For this operating license application, the NRC staff reviewed the revisions listed above to TVA-NQA-PLN89-A that TVA has made in accordance with 10 CFR 50.54(a)(3), since the NRC staff's last safety evaluation of TVA's corporate nuclear QA plan in 2004, to determine if TVA made any reductions in commitment. The staff did not identify any unreviewed reductions in commitment made by TVA since the staff's previous review in 2004. Since the staff previously approved the TVA corporate nuclear QA plan in 2004, and there have been no unreviewed reductions in commitment since the staff's approval, the staff concluded that TVA's QA program is in compliance with applicable NRC regulations and is acceptable for the design, construction, and operation of WBN Unit 2." SSER22 shows the status for this item as "Resolved."
17.4.0	0	C 01	Approved for both units in SER. See 17.3.
17.5.0		NA	Area not addressed in 1981 Standard Review Plan.
17.6.0		OV 07	10 CFR 50.65 – Maintenance Rule Unit 2 Action: Implement Maintenance Rule for Unit 2 systems 1 month prior to fuel load REVISION 05 UPDATE: TVA letter to NRC dated November 17, 2010 (ADAMS Accession No. ML103210644) revised this commitment to read "Implement Maintenance Rule for Unit 2 systems by October 31, 2011." REVISION 07 UPDATE: TVA letter to NRC dated October 17, 2011 (ADAMS Accession No. ML11292A199) revised this

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			commitment to read "Implement Maintenance Rule for Unit 2 systems by October 21, 2012."
18.0.0	0	NA	See 18.1.
18.1.0	22	CI 06	NUREG-0737, I.D.1, "Control Room Design Review" - NRC reviewed in SSER5, SSER6, SSER15, and Appendix EE of SSER16. In SSER6, the staff concluded that the DCRCR program implemented for Unit 1 satisfied the programmatic requirements of Supplement 1, NUREG-0737. In SSER15, the staff conducted a final onsite audit of the Unit 1 DCRDR and concluded that the product implemented conformed to the DCRDR requirements of Supplement 1, NUREG-0737 and that the DCRDR special program had been effectively implemented. In SSER16, the staff reviewed a TVA reclassification of a human engineering deficiency and concluded that it was satisfactory. Unit 2 Actions: Complete the CRDR process. Perform rewiring in accordance with ECN 5982. Take advantage of the completed Human Engineering reviews to ensure appropriate configuration for Unit 2 control panels. See CRDR Special Program. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the CRDR SP. --- In SSER21, the Detailed Control Room Design Review (CRDR) Special Program was resolved. Completion of CRDR is tracked under 23.3.3. --- --- REVISION 06 UPDATE: Section 18.1 includes: "In SSER 21, dated February 2009, the NRC staff stated that it had "reviewed the information provided by TVA and concluded that, based on the TVA description and the staff's review (documented in NUREG-1232, Volume 4, and the applicable supplements of NUREG-0847), there is reasonable assurance that, when implemented as described, certain [special program] issues can be designated as acceptable for implementation at WBN Unit 2." In SSER 21, Section 1.13.2, the staff identified the DCRDR as a resolved special program issue. The NRC staff also reviewed WBN Unit 2 Final Safety Analysis Report Amendment 99, dated May 27, 2010 (ADAMS Accession No. ML101610290), and determined that there were no changes to the TVA DCRDR special program." SSER22 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
18.2.0	22	CI 06	"CONCLUSIONS" left open until all items in subsection are closed. --- --- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). --- TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the CRDR SP. --- In SSER21, the Detailed Control Room Design Review (CRDR) Special Program was resolved. --- --- REVISION 06 UPDATE: Section 18.2 includes: "Since the NRC staff has approved the DCRDR special program approach for WBN Unit 1, and TVA proposed to use the same approach for WBN Unit 2, there is reasonable assurance that, when implemented as described by TVA, the DCRDR TMI task action (Item I.D.1 of NUREG-0660 and NUREG-0737) will be appropriately resolved for WBN Unit 2." SSER22 shows the status for this item as "Resolved."
22.3.0	22	O 06	--- --- REVISION 06 UPDATE: Section 22.3 includes: "Before the issuance of an operating license under Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," the Tennessee Valley Authority (TVA) is required to provide satisfactory documentation that it has obtained the financial protection required by 10 CFR 140.11(a)(4), and not less than the amount required by 10 CFR 50.54(w) with respect to insurance from private sources or an equivalent amount of protection covering the licensee's obligation. This is Open Item 25 (Appendix HH) until TVA provides the necessary documentation and the U.S. Nuclear Regulatory Commission staff has reviewed and approved it." SSER22 shows the status for this item as "Open (NRR)."
25.9.0	22	O 06	--- --- REVISION 06 UPDATE: Section 25.9 includes: "The NRC staff reviewed TVA's program to preserve the licensing basis for WBN Units 1 and 2 in accordance with SRM-SECY-07-0096 and using the assessment methodology documented in the staff's letter to TVA dated May 8, 2008. The staff concludes that TVA's program for maintenance and preservation of the licensing basis for WBN, if properly implemented, provides reasonable assurance that any effects on previously reviewed and resolved safety evaluation report topics will be evaluated for WBN

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			Unit 2. TVA's implementation of NGDC PP-20 and EDCR Appendix J will be audited or inspected by the NRC. This is Open Item 12 (Appendix HH)." SSER22 shows the status for this item as "Open (NRR)." ---------- Per TVA letter to NRC dated April 6, 2011, this action item is for NRC Inspection / Review.

STATUS CODE DEFINITIONS

C: CLOSED: Previous staff review of NUREG-0847 and/or supplements has closed the item either for both units at WBN or explicitly for WBN Unit 2.

CI: CLOSED/IMPLEMENTATION: Staff has approved either for both units at WBN or explicitly for WBN Unit 2; there is no change to the approved design; and implementation is recommended through Regional Inspection.

CO: CLOSED - OPEN: Staff has approved closure of the item; however, TVA actions remain to be completed.

CT: CLOSED/TECHNICAL SPECIFICATIONS: Item has been approved either for both units at WBN or explicitly for WBN Unit 2; however, a change to the original approval requires submittal of the Technical Specifications and staff review.

NA: NOT APPLICABLE: Justification as to why a section / subsection is not applicable is provided in the ADDITIONAL INFORMATION column.

O: OPEN: No action or documentation is provided that shows the staff has reviewed the item for WBN Unit 2.

OI: OPEN / INSPECTION: Staff has reviewed the item for WBN Unit 2; inspection is required to complete review / close the item.

OT: OPEN/TECHNICAL SPECIFICATIONS: No action or documentation is provided that shows the staff has reviewed the item for WBN Unit 2, and the resolution is through submittal of a Technical Specification.

OV: OPEN/VALIDATION: The proposed approach has been approved for Watts Bar Unit 1; the same approach is proposed for use on WBN Unit 2 without change.

S: SUBMITTED: Information has been submitted, and is under review by NRC staff.

*** = See last page for status code definition.**

Enclosure 2

SER and Supplements Review Matrix - Revision 8 Changes

SAFETY EVALUATION REPORT AND SUPPLEMENTS (NUREG-0847) REVIEW MATRIX: REVISION 8 CHANGES

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
2.3.3	25	C 08	See 13.3.3 (Emergency Preparedness Evaluation Conclusions). REVISION 06 UPDATE: 2.3.3 of SSER22 includes: "TVA described several updates in equipment and procedures. TVA also stated that it developed the WBN onsite meteorological program to be consistent with the guidance given in RG 1.23, Revision 1, "Meteorological Monitoring Programs for Nuclear Power Plants," issued March 2007, which is a revision from the previous phase of the program, developed to be consistent with the guidance in RG 1.23, Revision 0, "Onsite Meteorological Programs," issued February 1972. The NRC staff finds the use of this RG version acceptable. In addition, TVA provided tables of joint windspeed, wind direction, and atmospheric stability data for onsite meteorological measurements made from 1974 through 1993. SSER 15 (ADAMS Accession No. ML072060488) discussed these data, but the tables, which are an update of previous tables for 1974 through 1988, were not included in prior amendments because of an oversight. The NRC staff finds this replacement acceptable." SSER22 shows the status for this item as "Resolved." REVISION 08 UPDATE: 2.3.3 of SSER25 includes: "Meteorological data summarized in the JFD formats were reasonably consistent with the data provided in the hourly data summary formats. On the basis of this review, the NRC staff concluded that the data files provided by TVA for 1991 through 2010 give an adequate representation of the site conditions to facilitate calculation of the CR, EAB, and LPZ χ/Q values for DBA and χ/Q and D/Q values for routine release dose assessments for WBN Unit 2. The JFD summary for the data from 1991 through 2010 provided by letter dated November 7, 2011, and a discussion of the long-term representativeness of these data should be provided in the WBN Unit 2 FSAR. Upon receipt of the updated FSAR, the NRC staff will confirm that these updates have been made by TVA. This is Open Item 136 (Appendix HH)." SSER25 shows the status for this item as "Resolved."
2.3.4	25	CO 08	TVA updated information on portions of the metrology program in FSAR amendment 83. This was reviewed and found acceptable in SSER14. REVISION 06 UPDATE: 2.3.4 of SSER22 includes:

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			"The NRC staff previously addressed this section in SSER 15. TVA revised the reference number for Table 2.3-64a to Table 2.3-65. The NRC staff finds this change to be editorial and, therefore, acceptable." SSER22 shows the status for this item as "Resolved." ---------- ---------- REVISION 08 UPDATE: 2.3.4 of SSER25 includes: "In its letter dated September 15, 2011, TVA stated that it would revise FSAR Section 15.5 in a future amendment to reflect the χ/Q values presented in that letter. TVA reflected the EAB and LPZ χ/Q values from its letter dated June 27, 2011, in FSAR Amendment 105, dated August 12, 2011 (ADAMS Accession No. ML11236A158). The NRC staff will confirm, upon receipt, that TVA integrated the updated CR χ/Q values from its letter dated September 15, 2011, into a future amendment of the FSAR. This is Open Item 137 (Appendix HH)." ---------- SSER25 shows the status for this item as "Resolved."
2.3.5	25	CO -------- 08	TVA updated information on portions of the metrology program in FSAR amendment 83. This was reviewed and found acceptable in SSER14. ---------- ---------- REVISION 08 UPDATE: 2.3.5 of SSER25 includes: "The updated annual average χ/Q and D/Q values associated with the specific receptor locations appear in Table 11.3-8, and the sets of values for the 16 radial sectors are in Tables 2.3-75A and 2.3-75B, of FSAR Amendment 104, dated June 3, 2011 (ADAMS Accession No. ML11178A155). In addition, in FSAR Section 2.3.5, TVA stated that it discussed this topic in the WBN Offsite Dose Calculation Manual (ODCM). FSAR Section 11.3 also discusses this topic. Upon receipt of the updated ODCM, the NRC staff will confirm that TVA made the corresponding revisions related to the updated annual average χ/Q and D/Q values. This is Open Item 138 (Appendix HH). " ---------- SSER25 shows the status for this item as "Resolved."
5.3.1	25	C -------- 08	The staff reviewed TVA's submittal on reactor vessel irradiation in SSER11 and stated that the WB reactor vessels acceptably satisfy the requirements of 10 CFR 50.61. In SSER14, the staff determined that TVA complied with all the requirements in the current Appendix G, 10 CFR Part 50 without exemptions and the previously approved exemptions were no longer needed. ---------- ---------- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). ----------

* = See last page for status code definition.

REVISION 06 UPDATE:

The Conclusions portion of Section 5.3.1 in SSER22 states:

"Pending resolution of Open Item 44 (Appendix HH), the NRC staff concludes that the changes to the FSAR pertaining to the RV materials surveillance program are acceptable because the surveillance program meets the provisions of ASTM E185-82 and, therefore, meets the requirements of 10 CFR Part 50, Appendix H.

The staff concludes that the USE and RTPTS values projected at EOL for WBN Unit 2 are acceptable because the values meet the criteria of Appendix G to 10 CFR Part 50 and 10 CFR 50.61, respectively.

The staff concludes that the changes to the special processes meet the requirements of GDC 1 and 30 and 10 CFR 50.55a because the welding and NDE of the core support block attachment welds meet the requirements of ASME Code, Section III."

SSER22 shows the status for this item as "Open (NRR)."

TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 44:

"This response clarifies how the initial and irradiated RTNDT values were determined for the Watts Bar Unit 2 reactor pressure vessel beltline materials. Unit 2 FSAR Section 5.2.4.1 established that the vessel was designed to 1971 Addenda of the ASME Code, an edition that predates the requirements to determine the unirradiated RTNDT. (Those requirements were established in the Summer 1972 Addenda to the Code, Section III, Subarticle NB-2300, whereas the Watts Bar Unit 2 vessel was designed to an earlier version of the Code.) Because the tests performed to assess the adequacy of the fracture toughness predated the Summer 1972 Addenda to the Code, it was necessary to use the methods described in NRC Branch Technical Position (BTP) Materials Engineering Branch (MTEB) 5-2, 'Fracture Toughness Requirements for Older Plants.' For the Watts Bar Unit 2 vessel, the vessel shell materials were tested by the vessel fabricator using both drop-weight and Charpy impact test specimens. The drop-weight specimens were tested to determine the unirradiated nil-ductility transition temperature (NDTT) in accordance with ASTM E 208. In the ASME Code, Section III, Subarticle NB-2300, the NDTT is used with axial (weak) orientation Charpy test data to determine the initial (unirradiated) RTNDT. For Watts Bar Unit 2, the orientation of the Charpy impact test specimens was in the tangential (strong) orientation rather than in the axial (weak) orientation currently required in NB-2300 to determine the initial RTNDT. BTP MTEB 5-2 provides methods to determine the initial RTNDT using the drop-weight and Charpy impact test results generated for the Watts Bar Unit 2 vessel shell forgings and welds. In summary, both drop-weight and Charpy impact specimens in the tangential (strong) orientation were tested and the results were evaluated to determine the initial RTNDT following the methods in NRC BTP MTEB 5-2.

In addition to those tests performed by the vessel fabricator, unirradiated tests were performed on the Watts Bar Unit 2 reactor vessel surveillance program materials. Tests consisted of Charpy impact specimens from the intermediate shell forging and the core region metal that were oriented in both the tangential (strong) and axial (weak) orientations. When the surveillance program Charpy impact specimens are used with the drop-weight NDTT values obtained by the vessel fabricator, the initial RTNDT values obtained using NRC BTP MTEB 5-2 are found to be conservative.

The irradiated RTNDT, termed the Adjusted Reference Temperature (ART), is used to establish the pressure-Temperature (P-T) limit curves for the vessel as documented in the Pressure and Temperature Limits Report (PTLR). The PTLR for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.2.4.3. The initial P-T limit curves are based on predictions of the effects of irradiation using the methods in NRC Regulatory Guide 1.99, Revision 2, 'Radiation Embrittlement of Reactor Vessel Materials.' As post-irradiation test results become available from the evaluation of test specimens from the Watts Bar Unit 2 reactor vessel surveillance program, ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels", uses those test results to assess the accuracy and conservatism of the predictions based on the methods of NRC Regulatory Guide 1.99, Revision 2. The reactor vessel irradiation surveillance program for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.4.3.6. The effect of irradiation is measured using the Charpy impact specimens. Note that there are no drop-weight test specimens irradiated as part of the Watts Bar

Unit 2 surveillance program. The drop-weight specimens are used only for tests on the unirradiated material to determine the drop-weight NDTT.

In summary, both drop-weight and Charpy impact specimens (strong orientation) were tested and the results were evaluated to determine the initial (unirradiated) RTNDT following the methods in NRC BTP MTEB 5-2. Additional tests performed as part of the reactor vessel surveillance program using Charpy impact specimens (weak orientation for the intermediate shell forging), and those data obtained following the ASME Code, Section III, Subarticle NB-2300 demonstrated the initial RTNDT following the methods in NRC BTP MTEB 5-2 to be conservative. The irradiated RTNDT, termed the ART, will be determined using the methods in NRC Regulatory Guide 1.99. As post-irradiation test results become available from the reactor vessel surveillance program materials (the intermediate shell forging and the core region weld metal), those data will be used to assess the accuracy and conservatism of the predictions."

REVISION 08 UPDATE:

5.3.1 of SSER25 reads:

"5.3.1 Reactor Vessel Materials

Open Item 14

In Enclosure 1 of the Tennessee Valley Authority's (TVA's) letter dated July 31, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102290258), TVA responded to the U.S. Nuclear Regulatory Commission (NRC) staff's Request for Additional Information (RAI) 5.3.1-1, Question 1, and proposed changes to the pressure-temperature limits report (PTLR), including the addition of the reactor vessel (RV) surveillance capsule withdrawal schedule and a description of the RV surveillance program. In addition, TVA stated that the Watts Bar Nuclear Plant (WBN) Unit 2 PTLR is included in the WBN Unit 2 "System Description for the Reactor Coolant System" (WBN2-68-4001), which would be revised to reflect required revisions to the PTLR by September 17, 2010 (Supplemental Safety Evaluation Report (SSER) 22, Section 5.3.1, p 5-8). The staff identified Open Item 14 to verify that TVA had revised the PTLR to include the RV surveillance capsule withdrawal schedule and RV surveillance program description.

In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), TVA stated that Revision 1 (effective August 12, 2010) of WBN2-68-4001 reflected the required revisions to the PTLR.

The staff concludes that TVA's response to Open Item 14 is acceptable because it confirms that TVA has revised the PTLR to include the RV surveillance program information. Therefore, Open Item 14 is closed.

Open Item 44

In response to RAI 5.3.1-1, Question 2, contained in Enclosure 1 to TVA's letter dated July 31, 2010 (ADAMS Accession No. ML102290258), TVA stated that the material test requirements and the acceptance standard use the nil-ductility reference temperature, RTNDT, which is determined in accordance with American Society for Testing and Materials (ASTM) E208, "Standard Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels." Since ASTM E208 is the standard for drop-weight testing, while NRC requirements for determination of RTNDT require a combination of drop-weight and Charpy V-notch (Cv) tests, the NRC staff required, in Open Item 44, that TVA provide additional information to clarify how it determined the initial and irradiated RTNDT (SSER 22, Section 5.3.1, pp 5-9, 5-11, 5-13, 5-17, 5-28, 5-29, 5-31, 5-32).

In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), in response to Open Item 44, TVA explained that the WBN Unit 2 RV fabricator used a combination of drop-weight and Cv tests to determine the initial (unirradiated) RTNDT for the RV materials. The Cv specimens were oriented in the tangential (strong) direction rather that the axial (weak) direction, as is required by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code), Section III, Subarticle NB-2300, which is referenced in Appendix G, "Fracture Toughness Requirements," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," with

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			respect to the method for determining the unirradiated RTNDT. TVA explained that it designed the WBN Unit 2 RV in accordance with the ASME Code, Section II, 1971, addenda, which predate the current requirements for determining the unirradiated RTNDT. However, it used the guidance in NRC Branch Technical Position (BTP) MTEB 5-2 to adjust the Cv results to determine the equivalent properties in the weak direction, which it then used to determine the initial RTNDT. In addition, it performed unirradiated Cv tests on WBN Unit 2 RV surveillance program materials in both the weak and strong directions, and in conjunction with the drop-weight tests, to determine the unirradiated RTNDT. These Cv results showed that the initial RTNDT determination based on the Cv tests in the strong direction, adjusted using BTP MTEB 5-2, are conservative. TVA also stated that it determined the effects of irradiation on the WBN Unit 2 RV materials using Cv specimens in the surveillance capsules, and that it only used drop-weight testing to determine the unirradiated RTNDT. The staff concludes that TVA's response to Open Item 44 is acceptable because it clarifies how it determined the initial (unirradiated) and irradiated RTNDT, and because the methods TVA used are consistent with the guidance of BTP MTEB 5-2, which the staff finds acceptable for determining the fracture toughness properties of RVs fabricated before the current ASME Code, Section III, requirements for determining RTNDT came into effect. Therefore, Open Item 44 is closed. " SSER25 shows the status for this item as "Resolved."
5.3.2	25	C --- 08	OUTSTANDING ISSUE - P-T limits for Unit 2 not provided. Staff will review as part of Unit 2 Technical Specifications. In the original 1982 SER, NRC indicated that the review of the Unit 2 P-T limits would be completed as part of the review of the Unit 2 Technical Specifications. In SSER16, the staff found the pressure temperature limits methodology and the pressure temperature limits report for Unit 1 acceptable. Unit 2 action: Submit P-T limits. --- --- REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. WCAP-17035-NP "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation" was submitted with the TS. --- --- REVISION 06 UPDATE: The Conclusions portion of Section 5.3.2 in SSER22 states: "The NRC staff concludes, pending resolution of Open Items 44, 45, and 46, that the P-T limits imposed on the RCS for operating and testing conditions to ensure adequate safety margins against nonductile or rapidly propagating failure conform to the fracture toughness criteria of Appendix G to 10 CFR Part 50. The use of operating limits, as determined by the criteria defined in Section 5.3.2 of the SRP, provides reasonable assurance that nonductile or rapidly propagating failure will not occur. This is an acceptable basis for satisfying the requirements of 10 CFR 50.55a; Appendix G to 10 CFR Part 50; and GDC 1, 14, 31, and 32. Therefore, WBN Unit 2 FSAR Section 5.3 is acceptable." SSER22 shows the status for this item as "Open (NRR)." ---

* = See last page for status code definition.

TVA to NRC letter dated April 6, 2011 provided the following responses to Open Items 44, 45, and 46:

Open Item 44:

"This response clarifies how the initial and irradiated RTNDT values were determined for the Watts Bar Unit 2 reactor pressure vessel beltline materials. Unit 2 FSAR Section 5.2.4.1 established that the vessel was designed to 1971 Addenda of the ASME Code, an edition that predates the requirements to determine the unirradiated RTNDT. (Those requirements were established in the Summer 1972 Addenda to the Code, Section III, Subarticle NB-2300, whereas the Watts Bar Unit 2 vessel was designed to an earlier version of the Code.) Because the tests performed to assess the adequacy of the fracture toughness predated the Summer 1972 Addenda to the Code, it was necessary to use the methods described in NRC Branch Technical Position (BTP) Materials Engineering Branch (MTEB) 5-2, "Fracture Toughness Requirements for Older Plants." For the Watts Bar Unit 2 vessel, the vessel shell materials were tested by the vessel fabricator using both drop-weight and Charpy impact test specimens. The drop-weight specimens were tested to determine the unirradiated nil-ductility transition temperature (NDTT) in accordance with ASTM E 208. In the ASME Code, Section III, Subarticle NB-2300, the NDTT is used with axial (weak) orientation Charpy test data to determine the initial (unirradiated) RTNDT. For Watts Bar Unit 2, the orientation of the Charpy impact test specimens was in the tangential (strong) orientation rather than in the axial (weak) orientation currently required in NB-2300 to determine the initial RTNDT. BTP MTEB 5-2 provides methods to determine the initial RTNDT using the drop-weight and Charpy impact test results generated for the Watts Bar Unit 2 vessel shell forgings and welds. In summary, both drop-weight and Charpy impact specimens in the tangential (strong) orientation were tested and the results were evaluated to determine the initial RTNDT following the methods in NRC BTP MTEB 5-2.

In addition to those tests performed by the vessel fabricator, unirradiated tests were performed on the Watts Bar Unit 2 reactor vessel surveillance program materials. Tests consisted of Charpy impact specimens from the intermediate shell forging and the core region metal that were oriented in both the tangential (strong) and axial (weak) orientations. When the surveillance program Charpy impact specimens are used with the drop-weight NDTT values obtained by the vessel fabricator, the initial RTNDT values obtained using NRC BTP MTEB 5-2 are found to be conservative.

The irradiated RTNDT, termed the Adjusted Reference Temperature (ART), is used to establish the pressure-Temperature (P-T) limit curves for the vessel as documented in the Pressure and Temperature Limits Report (PTLR). The PTLR for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.2.4.3. The initial P-T limit curves are based on predictions of the effects of irradiation using the methods in NRC Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials." As post-irradiation test results become available from the evaluation of test specimens from the Watts Bar Unit 2 reactor vessel surveillance program, ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels", uses those test results to assess the accuracy and conservatism of the predictions based on the methods of NRC Regulatory Guide 1.99, Revision 2. The reactor vessel irradiation surveillance program for Watts Bar Unit 2 is discussed in Unit 2 FSAR Section 5.4.3.6. The effect of irradiation is measured using the Charpy impact specimens. Note that there are no drop-weight test specimens irradiated as part of the Watts Bar Unit 2 surveillance program. The drop-weight specimens are used only for tests on the unirradiated material to determine the drop-weight NDTT.

In summary, both drop-weight and Charpy impact specimens (strong orientation) were tested and the results were evaluated to determine the initial (unirradiated) RTNDT following the methods in NRC BTP MTEB 5-2. Additional tests performed as part of the reactor vessel surveillance program using Charpy impact specimens (weak orientation for the intermediate shell forging), and those data obtained following the ASME Code, Section III, Subarticle NB-2300 demonstrated the initial RTNDT following the methods in NRC BTP MTEB 5-2 to be conservative. The irradiated RTNDT, termed the ART, will be determined using the methods in NRC Regulatory Guide 1.99. As post-irradiation test results become available from the reactor vessel surveillance program materials (the intermediate shell forging and the core region weld metal), those data will be used to assess the accuracy and conservatism of the predictions."

Open Item 45:

"Revision 1 (effective August 12, 2010) to the Unit 2 System Description for the Reactor Coolant System (WBN2-68-4001) was revised to reflect the required revisions to the PTLR. Appendix B, Section 3.2 (Arming Temperature) states, "COMS shall be armed when any RCS cold leg temperature is <225°F."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION

Open Item 46:

"Revision 1 (effective August 12, 2010) to the Unit 2 System Description for the Reactor Coolant System (WBN2-68-4001) was revised to reflect the required revisions to the PTLR. Appendix B, TABLE 3.1-1 (Watts Bar Unit 2 PORV Setpoints vs Temperature) contains the lift settings."

REVISION 08 UPDATE:

5.3.2 of SSER25 reads:

"5.3.2 Pressure-Temperature Limits

"Open Item 45

TVA stated, in its response to RAI 5.3.2-2, dated July 31, 2010, that it would revise the PTLR to incorporate the cold overpressure mitigation system (COMS) arming temperature (SSER 22, Section 5.3.2, pp 5-28–29, 5-32). The staff identified Open Item 45 to verify incorporation of the COMS arming temperature into the PTLR.

In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), in response to Open Item 45, TVA stated that Revision 1 (effective August 12, 2010) to WBN2-68-4001 reflected the required revision to the PTLR. Appendix B, Section 3.2, "Arming Temperature," states, "COMS shall be armed when any RCS [reactor coolant system] cold leg temperature is less than / equal to 225 °F."

The staff concludes that TVA's response to Open Item 45 is acceptable because it confirms that TVA revised the PTLR to specify the COMS arming temperature. Therefore, Open Item 45 is closed.

Open Item 46

TVA did not include the low-temperature overpressure protection (LTOP) lift settings in the PTLR but provided them in its response to RAI 5.3.2-2 in its letter dated July 31, 2010. In its RAI response, TVA stated that it would revise the PTLR to incorporate the LTOP lift settings (SSER 22, Section 5.3.2, pp 5-28–29, 5-32). The staff identified Open Item 46 to verify incorporation of the LTOP settings into the PTLR.

In a letter dated April 6, 2011 (ADAMS Accession No. ML110980637), in response to Open Item 46, TVA stated that Revision 1 (effective August 12, 2010) to WBN2-68-4001 reflected the required revisions to the PTLR. Appendix B, Table 3.1-1, "Watts Bar Unit 2 PORV [Power-Operated Relief Valve] Setpoints vs. Temperature," contains the LTOP lift settings.

The staff concludes that TVA's response to Open Item 46 is acceptable because it confirms that TVA revised the PTLR to include the LTOP lift settings into the PTLR. Therefore, Open Item 46 is closed."

SSER25 shows the status for this item as "Resolved."

7.5.2	25	OI	OUTSTANDING ISSUE involving RG 1.97 instruments following course of an accident
		08	In the original 1982 SER, the staff stated that WBN did not use RG 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plants and Environs Conditions During and Following an Accident," for the design because the design predated the RG. In SSER7, an outstanding issue was opened. TVA provided NRC information on exceptions to RG 1.97. A detailed review was performed for both units (Appendix V of SSER9). The staff concluded that WBN conforms to or has adequately justified deviations from the guidance of RG 1.97, Revision 2. TVA submitted additional deviations for both units in letters dated May 9, 1994, and April 21, 1995. In SSER14 and SSER15, the additional deviations to RG 1.97 were reviewed and accepted by NRC. NUREG-0737, II.F.1.2, ""Accident Monitoring Instrumentation" – Reviewed in SSER9.

* = See last page for status code definition.

Unit 2 Actions: Install Noble gas, Iodine / particulate sampling, and Containment High Range Monitors.

CI in NRC May 28, 2008, letter.

REVISION 02 UPDATE:

The status in SSER21 is Open (NRR).

REVISION 07 UPDATE:

[all portions are from SSER23]

7.5.2.2.3 includes:

"SRP Section 7.5, Revision 5 identifies IEEE Std. 603-1991 as being applicable to accident monitoring instrumentation. Based on its review of this item, the staff has the following open items:

* TVA should provide to the staff either information that demonstrates that the WBN Unit 2 Common Q PAMS meets the applicable requirements in IEEE Std. 603-1991, or justification for why the Common Q PAMS should not meet those requirements. This is Open Item 94 (Appendix HH).

* TVA should update FSAR Table 7.1-1, 'Watts Bar Nuclear Plant NRC Regulatory Guide Conformance,' to reference IEEE Std. 603-1991 for the WBN Unit 2 Common Q PAMS. This is Open Item 95 (Appendix HH).

AND

"The NRC staff's detailed evaluation of the Common Q PAMS equipment against the environmental criteria is addressed in SSER Section 7.5.2.2.3.5. RG 1.100, Revision 1 is used, in part, to address WBN Unit 2 Design Criterion 2. Based on its review of this item, the NRC staff has the following open item:

* TVA should (1) update FSAR Table 7.1-1 to include RG 1.100, Revision 3 for the Common Q PAMS, or (2) demonstrate that the Common Q PAMS is in conformance with RG 1.100, Revision 1, or (3) provide justification for not conforming. This is Open Item 96 (Appendix HH)."

AND

"Based on the reasoning quoted above, the staff concludes that TVA did not evaluate the Common Q PAMS against the criteria of RG 1.153, Revision 1; therefore, the staff has the following open item (see also Open Items 94 and 95 above):

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.153, Revision 1 or provide justification for not conforming. This is Open Item 97 (Appendix HH)."

AND

"Based on the review of this item, the NRC staff has the following open item:

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.152, Revision 2, or provide justification for not conforming. This is Open Item 98 (Appendix HH)."

AND

"The WBN Unit 2 FSAR references IEEE 7-4.3.2-1982, 'IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations,' as endorsed by RG 1.152, Revision 0 for the Eagle 21 system. The current staff position is documented in RG 1.152, Revision 2, which endorses

IEEE Std. 7-4.3.2-2003, 'IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations,' as an acceptable method for using digital computers to meet IEEE Std. 603-1991. Based on the review of this item, the NRC staff has the following open item:

* TVA should update FSAR Table 7.1-1 to reference IEEE 7-4.3.2-2003 as being applicable to the WBN Unit 2 Common Q PAMS. This is Open Item 99 (Appendix HH)."

AND

"The current staff positions are documented in RG 1.168, Revision 1, IEEE 1012-1998; and IEEE 1028-1997. Based on its review of this item, the NRC staff has the following open item:

* TVA should update FSAR Table 7.1-1 to reference RG 1.168, Revision 1, IEEE Std. 1012-1998, and IEEE 1028-1997 as being applicable to the WBN Unit 2 Common Q PAMS. This is Open Item 100 (Appendix HH)."

AND

"The Common Q PAMS was designed and implemented in accordance with the SPM, which was found by the NRC staff to meet the requirements of RG 1.168, Revision 0, issued September 1997; IEEE Std. 1012-1986, 'IEEE Standard for Software Verification and Validation Plans'; and IEEE Std. 1028-1988, 'IEEE Standard Software Reviews and Audits.' (See NRC reports (1) 'Safety Evaluation by the Office of Nuclear Reactor Regulation CE Nuclear Power Topical Report CENPD-396-P 'Common Qualified Platform' Project No. 692,' issued August 2000, Section 4.3.1 .j, 'Software Verification and Validation Plan' (ADAMS Accession No. ML003740165), and (2) WCAP-16096-NP-A, 'Software Program Manual for Common Q Systems,' Revision 1A, NRC safety evaluation incorporated into the document, Section 2, 'Regulatory Evaluation' (ADAMS Accession No. ML050350234)). Based on its review of this item, the staff has the following open item:

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS application software is in conformance with RG 1.168, Revision 1 or provide justification for not conforming. This is Open Item 101 (Appendix HH).

AND

"The WBN Unit 2 FSAR does not reference Regulatory Guide 1.209, which endorses IEEE Std. 323-2003, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations.' TVA did not perform a comparison evaluation of the Common Q PAMS with the criteria in RG 1.209. Based on its review, the NRC staff has the following open items:

* TVA should update FSAR Table 7.1-1 to reference RG 1.209 and IEEE Std. 323-2003 as being applicable to the WBN Unit 2 Common Q PAMS. This is Open Item 102 (Appendix HH).

* TVA should demonstrate that the WBN Unit 2 Common Q PAMS conforms to RG 1.209 and IEEE Std. 323-2003 or provide justification for not conforming. This is Open Item 103 (Appendix HH)."

AND

"TVA did not provide a comparison evaluation of Common Q PAMS to the criteria in IEEE Std. 323-2003. (See Open Item 103 above.)"

7.5.2.2.3.4.1 includes:

"The NRC revised RG 1.152 and 1.168 after the staff's approval of the SPM. Open Item Nos. 98 and 101 address the acceptability of the SPM for complying with the guidance of RGs 1.152 and 1.168, respectively (Appendix HH). The remaining RGs used to determine the acceptability of the SPM have not changed, and the processes described in the SPM have not changed; therefore, the staff considers the SPM to be acceptable for these unchanged aspects."

7.5.2.2.3.4.2 includes:

"The NRC staff will review the WEC self-assessment to verify that the WBN Unit 2 PAMS complies with the V&V requirements in the SPM or that deviations from the requirements are adequately justified. This is Open Item 104 (Appendix HH)."

7.5.2.2.3.4.2.2 includes:

"During its audit from February 28 to March 4, 2011, of the WEC CGD activities, the NRC staff examined implementation of the vendor's SWP, as specified in SPM Section 5, for the WBN Unit 2 Common Q PAMS. The staff concluded that only some aspects of the SWP were followed, and that the QA oversight of the SPM did not identify the discrepancies. As described above in SSER Section 7.5.2.2.3.4.2, 'Software Implementation Documentation,' TVA/WEC took project-specific and generic action items to address the discrepancies. The NRC staff's verification of these actions is included in Open Item 104 (Appendix HH). Pending closure of Open Item 104, the NRC staff concludes that implementation of V&V for the Common Q PAMS is acceptable."

7.5.2.2.3.4.2.4 includes:

"The SPM describes the software testing and documents that TVA will create (e.g., SPM Section 5.8, 'V&V Test Documentation Requirements,' Section 8.8, 'Test Documentation'). The SPM also describes the testing tasks that TVA is to carry out. The acceptance criterion for software test implementation is that the tasks in the SPM have been carried out in their entirety. The three subsections below address the three different testing activities evaluated by the NRC staff. Other aspects regarding the acceptability of testing activities are addressed in Open Items Nos. 101 and 104 (Appendix HH)."

7.5.2.2.3.4.3.1 includes:

"The audit report (ADAMS Accession No. ML1 10691232, not publicly available) stated the following:

For the WBN2 PAMS project, Westinghouse will provide documentation in their Rockville MD offices demonstrating that each document requiring independent review was in fact independently reviewed. CAPs No. 11-061-M047 will contain a commitment to provided documented evidence of appropriate independent reviews.

This is included in Open Item 104 (Appendix HH)."

AND

"Based on (1) the review of the SysRS and SRS, (2) the audit of the RTMs, and (3) the review of the traceability analysis in the LTR, the staff has the following open items (Appendix HH):

* Open Item 105: TVA should provide to the NRC staff an acceptable description of how the WBN Unit 2 Common Q PAMS SysRS and SRS implement the design-basis requirements of IEEE Std. 603-1991, Clause 4.

* Open Item 106: TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SRS is independently reviewed."

7.5.2.2.3.4.3.2 includes:

"The SDDs do not include any documented evidence that they were independently reviewed. As a result, the NRC staff has the following open item (Appendix HH):

* Open Item 107: TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SDDs are independently reviewed."

7.5.2.2.3.5.2 includes:

"Table 5.3-1 of the qualification summary report provides the test environmental conditions from the various test programs. Based on the NRC staff's review of the test program results, the staff concluded that the required environmental test conditions satisfy the WBN Unit 2 plant-specific environmental requirements, including a heat rise inside the PAMS cabinet. The tested conditions from the various test programs envelop the required environmental test conditions at WBN Unit 2. Therefore, the NRC staff concludes that the environmental qualification of the Common Q PAMS meets the acceptance criteria of RG 1.209. The staff had two open items. Based on its review of the environmental qualification reports, the staff could not determine whether or not TVA had considered in the equipment testing any potential synergistic effects between temperature and humidity. This is Open Item 108 (Appendix HH). Because the staff used the criteria of RG 1.209, Open Item 102 (SSER Section 7.5.2.2.3; Appendix HH) also applies to this SSER subsection.

Open Item 108: TVA should demonstrate to the NRC staff that there are no synergistic effects between temperature and humidity for the Common Q PAMS equipment."

7.5.2.2.3.5.3 includes:

"The seismic qualification testing of the AC160/Common Q equipment was performed to both IEEE Std. 344-1975 and IEEE Std. 344-1987. However, as noted in the WBN Unit 2 Common Q PAMS SysRS, the PAMS must be seismically qualified to IEEE Std. 344-1975. The seismic testing on the AC160/Common Q equipment that was performed in accordance with IEEE Std. 344-1987 bounds the requirements specified in IEEE Std. 344-1975. Therefore, the staff concludes that all of the AC160/Common Q seismic qualification testing was performed in accordance with IEEE Std. 344-1975, and that the seismic qualification is acceptable. Open Item 96 (Appendix HH; SSER Section 7.5.2.2.3) also applies to this SSER subsection because RG 1.100, Revision 3 references IEEE Std. 344-1987."

7.5.2.2.3.7 includes:

"There is no communication between PAMS divisions. The divisions are physically separate, with no interconnection between divisions throughout the system architecture (i.e., from the input to the displays). The communications isolation between the safety-related Common Q PAMS and the plant computer are unidirectional via the MTP software and a nonsafety-related data diode. The MTP is presumed to fail during certain postulated failures of the connected nonsafety-related equipment. These failures have been demonstrated (i.e., via data storm testing) to not affect the connected AC160 components or the OM (see Open Item 109 below; Appendix HH). Data storm testing along with the DI&C-ISG-04 compliance analysis (documented in the subsection below) provide reasonable assurance that the independence criteria (i.e., IEEE Std. 603, Clause 5.5 and IEEE Std. 7-4.3.2, Clause 5.6) are met; therefore, the Common Q PAMS communications independence is acceptable to the NRC staff."

7.5.2.2.3.7.1.8 includes:

"No data are exchanged between safety divisions in the PAMS, but data are communicated through a one-way data link to the nonsafety-related plant computer. The one-way aspects of this nonsafety-related data link are not credited because the MTP is the credited isolation device. The MTP is postulated to fail during a data storm, but this failure was demonstrated by testing not to affect the AC160 processor or the OM (i.e., to not affect the safety function). Based on the testing results, the use of the MTP in this manner is acceptable. Therefore, the WBN Unit 2 Common Q PAMS communications meet the staff position and are acceptable. The staff had one open item (Appendix HH) for followup.

* Open Item 109: TVA should demonstrate to the NRC staff acceptable data storm testing of the

Common Q PAMS."

7.5.2.2.3.9 includes:

"TVA has not provided an analysis demonstrating that the criteria of IEEE Std. 603-1991 have been met (see Open Item 94, Appendix HH). However, the NRC staff performed its own analysis, as documented in the subsections below, and concluded, pending the resolution of Open Item 94, that there is reasonable assurance that the regulatory criteria in IEEE Std. 603-1991 have been met, and that the WBN Unit 2 Common Q PAMS system is acceptable."

7.5.2.2.3.9.2.6 includes:

"Each of the PAMS channels is designed to permit periodic software testing of the CET and saturation margin algorithms on demand; however, there appeared to be no description of how the RVLIS algorithm is periodically tested. This is Open Item 110 (Appendix HH).

* Open Item 110: TVA should provide information to the NRC staff describing how the WBN Unit 2 Common Q PAMS design supports periodic testing of the RVLIS function."

7.5.2.2.3.11 includes:

"TVA should confirm to the staff that there are no changes required to the technical specifications as a result of the modification installing the Common Q PAMS. If any changes to the technical specifications are required, TVA should provide the changes to the NRC staff for review. This is Open Item 111 (Appendix HH)."

7.5.2.2.3.12 includes:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.152, Revision 2 or provide justification for not conforming. As noted in SSER Section 7.5.2.2.3, this is Open Item 98 (Appendix HH)."

7.5.2.2.4 reads:

"Based on the review of the WBN Unit 2 Common Q PAMS design, as described above, the NRC staff concludes that there is reasonable assurance that the system fully conforms to the design, quality, functional and TMI-related criteria summarized above in SSER Section 7.5.2.2.2, with the open items (Appendix HH) noted in SSER Section 7.5.2.2."

7.5.2.3.4 includes:

"It is unclear to the NRC staff which software V&V documents are applicable to the HRCAR monitors. TVA should clarify which software V&V documents are applicable in order for the staff to complete its evaluation. This is Open Item 77 (Appendix HH)."

AND

"The staff asked TVA to address the radiation qualification of the HRCAR monitors. In its response dated February 25, 2011 (item number 349; ADAMS Accession No. MLI 10620219), TVA stated, in part, the following:

Calculation WBNAPS3-126 will be revised to add the control room to the calculation with a dose of less than 1 x 10E3 RAD by July 1, 2011. Since the control room TID will be documented in calculation WBNAPS3-126 to be less than 1 x 10E3 RAD, radiation qualification of the RM-1000 is not required.

This is Open Item 78 (Appendix HH) until TVA issues its revised calculation reflecting that the total integrated dose (TID) in the control room is less than 1 x 10E3 rads, and the staff completes its review.

The staff evaluated TVA's testing for EMI/RFI, as discussed in this section below with regard to compliance with RG 1.180. However, TVA specified no exclusion distances for the HRCAR monitors. TVA should perform a radiated susceptibility survey, after the installation of the hardware but before the RM-1 000 is placed in service, to establish the need for exclusion distance for the HRCAR monitors while using handheld portable devices (e.g., walkie-talkie) in the control room, as documented in Attachment 23 to TVA's letter dated February 25, 2011, and item number 355 of TVA's letter dated April 15, 2011. This is Open Item 79 (Appendix HH). The seismic qualification of the monitors is enveloped by the staff's evaluation of electrical equipment in Section 3.10 of this SSER. Pending closure of Open Items 78 and 79, the staff concludes that the HRCAR monitors have been qualified by test and analysis and meet the applicable seismic and environmental requirements. This satisfies Clause 5.4 of IEEE Std. 603-1991.

AND

"TVA should provide clarification to the staff on how TVA Standard Specification SS-E18-14.1 meets the guidance of RG 1.180 and should address any deviations from the guidance of the RG. This is Open Item 80 (Appendix HH)."

AND

"As noted above, this is Open Item 78 (Appendix HH) until TVA issues its revised calculation reflecting that the TID in the control room is less than 1 x 10E3 rads, and the staff completes its review."

AND

"As documented (item number 353) in the NRC/TVA open item master list status report dated April 8, 2011 (ADAMS Accession No. ML1 11050009), TVA stated that GA's commercial dedication program did not require multiple dedication methods in accordance with the guidance of EPRI TR-1 06439, but that GA has taken additional measures to assure quality. TA should provide information about the extent to which GA complies with EPRI TR-1 06439 and the methods that GA used for its commercial dedication process to the NRC staff for review. This is Open Item 81 (Appendix HH)."

7.5.2.3.5 reads:

"Based on its evaluation of the information provided by TVA as described above, the NRC staff concludes that the digital HRCAR monitors comply with the applicable regulatory requirements of 10 CFR 50.55a(a)(1), 10 CFR 50.55a(h), Appendix B to 10 CFR Part 50, 10 CFR 50.34(f)(2)(xix), GDC 13, GDC 19, GDC 24, GDC 64, and IEEE Std. 603-1991, and with the regulatory guidance of RG 1.97, Revision 2, RG 1.180, Revision 1, and RG 1.209. Therefore, the HRCAR monitors are acceptable, pending closure of the open items in SSER Section 7.5.2.3."

SSER23 shows the status for this item as "Open (Inspection)."

Open Item 77 (Appendix HH) reads as follows:

"It is unclear to the NRC staff which software V&V documents are applicable to the HRCAR monitors. TVA should clarify which software V&V documents are applicable, in order for the staff to complete its evaluation. (Section 7.5.2.3)

Open Item 78 (Appendix HH) reads as follows:

"TVA intends to issue a revised calculation reflecting that the TID in the control room is less than 1 x 10E3 rads, which will be evaluated by the NRC staff. (Section 7.5.2.3)"

Open Item 79 (Appendix HH) reads as follows:

"TVA should perform a radiated susceptibility survey, after the installation of the hardware but prior to the RM-1000 being placed in service, to establish the need for exclusion distance for the HRCAR monitors while using handheld portable devices (e.g., walkietalkie) in the control room, as documented in Attachment 23 to TVA's letter dated February 25, 2011, and item number 355 of TVA's letter dated April 15, 2011. (Section 7.5.2.3)"

Open Item 80 (Appendix HH) reads as follows:

"TVA should provide clarification to the staff on how TVA Standard Specification SS-E18-14.1 meets the guidance of RG 1.180, and should address any deviations from the guidance of the RG. (Section 7.5.2.3)"

Open Item 81 (Appendix HH) reads as follows:

"The extent to which TVA's supplier, General Atomics (GA), complies with EPRI TR-106439 and the methods that GA used for its commercial dedication process should be provided by TVA to the NRC staff for review. (Section 7.5.2.3)"

Open Item 94 (Appendix HH) reads as follows:

"TVA should provide to the staff either information that demonstrates that the WBN Unit 2 Common Q PAMS meets the applicable requirements in IEEE Std. 603-1991, or justification for why the Common Q PAMS should not meet those requirements. (Section 7.5.2.2.3)"

Open Item 95 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1, "Watts Bar Nuclear Plant NRC Regulatory Guide Conformance," to reference IEEE Std. 603-1991 for the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 96 (Appendix HH) reads as follows:

"TVA should (1) update FSAR Table 7.1-1 to include RG 1.100, Revision 3, for the Common Q PAMS, or (2) demonstrate that the Common Q PAMS is in conformance with RG 1.100, Revision 1, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 97 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.153, Revision 1, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 98 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.152, Revision 2, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 99 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1 to reference IEEE 7-4.3.2-2003 as being applicable to the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 100 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1 to reference RG 1.168, Revision 1; IEEE 1012-1998; and IEEE 1028-1997 as being applicable to the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 101 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS application software is in conformance with RG 1.168, Revision 1, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 102 (Appendix HH) reads as follows:

"TVA should update FSAR Table 7.1-1 to reference RG 1.209 and IEEE Std. 323-2003 as being applicable to the WBN Unit 2 Common Q PAMS. (Section 7.5.2.2.3)"

Open Item 103 (Appendix HH) reads as follows:

"TVA should demonstrate that the WBN Unit 2 Common Q PAMS conforms to RG 1.209 and IEEE Std. 323-2003, or provide justification for not conforming. (Section 7.5.2.2.3)"

Open Item 104 (Appendix HH) reads as follows:

"The NRC staff will review the WEC self assessment to verify that it the WBN Unit 2 PAMS is compliant to the V&V requirements in the SPM or that deviations from the requirements are adequately justified. (Section 7.5.2.2.3.4.2)"

Open Item 105 (Appendix HH) reads as follows:

"TVA should produce an acceptable description of how the WBN Unit 2 Common Q PAMS SysRS and SRS implement the design basis requirements of IEEE Std. 603-1991 Clause 4. (Section 7.5.2.2.3.4.3.1)"

Open Item 106 (Appendix HH) reads as follows:

"TVA should produce a final WBN Unit 2 Common Q PAMS SRS that is independently reviewed. (Section 7.5.2.2.3.4.3.1)"

Open Item 107 (Appendix HH) reads as follows:

"TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SDDs that are independently reviewed.
(Section 7.5.2.2.3.4.3.2)"

Open Item 108 (Appendix HH) reads as follows:

"TVA should demonstrate to the NRC staff that there are no synergistic effects between temperature and humidity for the Common Q PAMS equipment. (Section 7.5.2.2.3.5.2)"

Open Item 109 (Appendix HH) reads as follows:

"TVA should demonstrate to the NRC staff acceptable data storm testing of the Common Q PAMS. (Section 7.5.2.2.3.7.1.8)"

Open Item 110 (Appendix HH) reads as follows:

"TVA should provide information to the NRC staff describing how the WBN Unit 2 Common Q PAMS design supports periodic testing of the RVLIS function. (Section 7.5.2.2.3.9.2.6)"

Open Item 111 (Appendix HH) reads as follows:

"TVA should confirm to the staff that there are no changes required to the technical specifications as a result of the modification installing the Common Q PAMS. If any changes to the technical specifications are required, TVA should provide the changes to the NRC staff for review. (Section 7.5.2.2.3.11)"

REVISION 08 UPDATE:

7.5.2 of SSER25 reads:

"7.5.2 Postaccident Monitoring System

7.5.2.2 Common Qualified Platform—Postaccident Monitoring System

Disposition of Open Items (Appendix HH)

Open Item 72

Open Item 72 states, 'The NRC staff should complete its review and evaluation of the additional information provided by TVA regarding the ICC [inadequate core cooling] instrumentation.' The item was generated during the U.S. Nuclear Regulatory Commission (NRC) staff's review of the Tennessee Valley Authority's (TVA's) Watts Bar Nuclear (WBN) reactor in Section 4.4.8 of Supplemental Safety Evaluation Report (SSER) 23, issued July 2011.

The NRC staff documented its review of the Common Q postaccident monitoring system (PAMS) and ICC in Section 7.5.2.2 of SSER 23. The staff generated Open Items 94–111 (Appendix HH) during its review. Therefore, Open Item 72 is closed, because it is subsumed by Open Items 94–111.

Open Item 95

Open Item 95 states, 'TVA should update FSAR Table 7.1-1, 'Watts Bar Nuclear Plant NRC Regulatory Guide Conformance,' to reference IEEE Std. 603-1991 for the WBN Unit 2 Common Q PAMS.'

In Table 7.1-1 of Final Safety Analysis Report (FSAR) Amendment 105, dated August 12, 2011, TVA stated the following:

IEEE Std. 603-1991, 'IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,' (See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability
These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised wording in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 95 is closed.

Open Item 96

Open Item 96 states, 'TVA should (1) update FSAR Table 7.1-1 to include RG 1.100, Revision 3 for the Common Q PAMS, or (2) demonstrate that the Common Q PAMS is in conformance with RG 1.100, Revision 1, or (3) provide justification for not conforming.'

By letter dated August 4, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11222A113), TVA responded to the open item, stating that it will add Regulatory Guide (RG) 1.100, 'Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants,' Revision 3, issued September 2009, to Table 7.1-1 for Common Q PAMS. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.100, Revision 3, September 2009, 'Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants' (See Notes 13, 14, and 16).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability
These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Note 16 Conformance to Regulatory Guide 1.100, Revision 3 and IEEE 344-2004
The Common Q new design modules used in the PAMS; and the RM-1000 radiation monitors comply with IEEE 344-2004 and with Regulatory Guide 1.100 Revision 3 with the exception of issues associated with testing above 33Hz.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 96 is closed.

Open Item 97

Open Item 97 states, 'TVA should demonstrate that the WBN Unit 2 Common Q PAMS is in conformance with RG 1.153, Revision 1 or provide justification for not conforming.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item, stating that it will add RG 1.153, 'Criteria for Safety Systems,' Revision 1, issued June 1996, to FSAR Table 7.1-1 for Common Q PAMS. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.153, Revision 1, June 1996, 'Criteria for Safety Systems' (See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability
These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 97 is closed.

Open Item 99

Open Item 99 states, 'TVA should update FSAR Table 7.1-1 to reference IEEE 7-4.3.2-2003 as being applicable to the WBN Unit 2 Common Q PAMS.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this action item, stating that it would add Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 7-4.3.2, 'Application Criteria for Programmable Digital Computer Systems in Safety Systems of Nuclear Power Generating Stations,' to Table 7.1-1 for Common Q PAMS. Table 7.1-1 of FSAR Amendment 105 states the following:

IEEE Std. 7-4.3.2-2003 'Application Criteria for Programmable Digital Computer Systems in Safety Systems of Nuclear Power Generating Stations' (See Notes 13 and 18).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability

These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

...

Note 18 Conformance to IEEE 7-4.3.2-2003

The Common Q PAMS meets the applicable requirements of IEEE 7-4.3.2-2003, except as noted below:

1. The quality program is in accordance with WCAP-16096-NP-1A 'Software Program Manual' (SPM).

2. The commercial item dedication program is in accordance with the Westinghouse 10CFR50.54 Appendix B program.'

However, in its audit report dated April 27, 2011 (ADAMS Accession No. ML110980761), the NRC staff identified several examples of practices that do not comply with the software program manual, or where Westinghouse no longer followed the software program manual. The software program manual also contains criteria for commercial-grade dedication. Based on the revised wording in FSAR Amendment 105, the NRC staff concluded that TVA did not adequately address the item.

By letter dated September 30, 2011 (ADAMS Accession No. ML11286A037, Enclosure 1, Item 17), TVA stated the following:

The inclusion of Note 18 was caused by a misinterpretation of the requirements of RG 1.152 Revision 3 as it applied to IEEE 7-4.3.2 2003 by the TVA reviewer. Discussion with the NRC reviewer determined that the note was not required. Note 18 was removed in FSAR Amendment 106.

Since TVA updated the FSAR to include reference IEEE Std. 7-4.3.2-2003 as applicable to the WBN Unit 2 Common Q PAMS, Open Item 99 is closed.

Open Item 100

Open Item 100 states, 'TVA should update FSAR Table 7.1-1 to reference RG 1.168, Revision 1, IEEE Std. 1012-1998, and IEEE 1028-1997 as being applicable to the WBN Unit 2 Common Q PAMS.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item, stating that it would add RG 1.168, 'Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants,' Revision 1, issued February 2004; IEEE Std. 1012-1998, 'IEEE Standard for Software Verification and Validation'; and IEEE Std. 1028-1997, 'IEEE Standard for Software Reviews,' to Table 7.1-1 for Common Q PAMS. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.168, Revision 1, February 2004, 'Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants' (See Note 13)...IEEE Std. 1012-1998, 'IEEE Standard for Software Verification and Validation' (See Note 13). IEEE Std. 1028-1997, 'IEEE Standard for Software Reviews'(See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability

These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 100 is closed.

Open Item 102

Open Item 102 states, 'TVA should update FSAR Table 7.1-1 to reference RG 1.209 and IEEE Std. 323-2003 as being applicable to the WBN Unit 2 Common Q PAMS.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item, stating that it would add RG 1.209, 'Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants,' issued March 2007, and IEEE Std. 323-2003, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations,' to Table 7.1-1. In Table 7.1-1 of FSAR Amendment 105, TVA stated the following:

Regulatory Guide 1.209, Revision 0, March 2007, 'Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants' (See Note 13)...IEEE Std. 323-2003, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations,' (See Note 13).

...

Note 13 Common Q Post Accident Monitoring System (PAMS) Applicability

These Rules, Regulations and standards are applicable to the design of the Common Q PAMS system cabinets.

Based on the revised words in FSAR Amendment 105, the NRC staff concludes that the open item has been adequately addressed. Therefore, Open Item 102 is closed.

Open Item 103

Open Item 103 states, 'TVA should demonstrate that the WBN Unit 2 Common Q PAMS conforms to RG 1.209 and IEEE Std. 323-2003 or provide justification for not conforming.'

By letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), TVA responded to this open item; Attachment 3 to the letter included the requested evaluation.

Based on its review of the information submitted by TVA, the staff concluded that TVA provided an adequate evaluation of conformance with RG 1.209 and IEEE Std. 323-2003. herefore, Open Item 103 is closed.

Open Item 104

Open Item 104 states, 'The NRC staff will review the WEC [Westinghouse Electric Corporation] self-assessment to verify that the WBN Unit 2 PAMS complies with the V&V [verification and validation] requirements in the SPM or that deviations from the requirements are adequately justified.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA provided information to address this item (see letter item 15, 'NRC Common Q PAMS Audit Action Items Response'). The information provided and the information subsequently reviewed demonstrate that Westinghouse did not consistently follow the software program manual and that Westinghouse did not plan and document these deviations beforehand; however, TVA did provide sufficient information to allow the NRC staff to determine, with reasonable assurance, that the Common Q PAMS does not pose a threat to public health and safety. Therefore, Open Item 104 is closed.

Open Item 106

Open Item 106 states, 'TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SRS [system requirements specification] is independently reviewed.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA responded to 'NRC Request (Item Number 372),' documenting why it concluded that the reviews were independent. The information provided was essentially an affirmation that the documents were independently reviewed. The Westinghouse internal guidance (reviewed during the NRC audit documented at ADAMS Accession No. ML110980761) is inconsistent on how to document that a review was an 'independent review - satisfying Appendix B' versus a more informal review. However, the NRC staff considers that the affirmation provided by TVA in its letter dated June 10, 2011, is sufficient; therefore, Open Item 106 is closed.

Open Item 107

Open Item 107 states, 'TVA should provide to the NRC staff documentation to confirm that the final WBN Unit 2 Common Q PAMS SDDs [software design documents] are independently reviewed.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA responded to 'NRC Request (Item Number 373),' documenting why it concluded that the reviews were independent. The information provided was essentially an affirmation that the documents were independently reviewed. The Westinghouse internal guidance (reviewed during the NRC audit documented at ADAMS Accession No. ML110980761) is inconsistent on how to document that a review was an 'independent review - satisfying Appendix B' versus a more informal review. However, the NRC staff considers the affirmation provided by TVA in its letter dated June 10, 2011, to be sufficient; therefore, Open Item 107 is closed.

Open Item 109

Open Item 109 states, 'TVA should demonstrate to the NRC staff acceptable data storm testing of the Common Q PAMS.'

By letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA responded to '18. NRC Verbal Request,' which stated the following:

Watts Bar Unit 2 Post Accident Monitoring System went through a Data Storm Test to verify that the safety related functions of the system driven by the Advant Controller 160 (AC 160) and the safety related indications monitored on the Operator Module (OM) located in the Main Control Room (MCR) are not affected when the Ethernet network interface of the Maintenance and Test Panel (MTP) is under data storm conditions. This test was requested by TVA.

The purpose of the data storm test was to test the ability of the MTP to handle the possible volume of traffic generated by a broadcast storm without impacting the safety functions. A broadcast storm occurs when a large number of broadcast packets are received. Forwarding these packets can cause the network to slow down or to time out.

Another objective of the data storm test was to test the ability of the MTP to handle malformed packets possibly generated by a data storm without impacting the safety functions.

TVA also described the pass/fail criteria and associated results. The PAMS continued to perform its safety function during the data storm testing, as demonstrated by its meeting the acceptance criteria.

Based on its review of the information provided by TVA, the NRC staff concludes that the open item was acceptably addressed. Therefore, Open Item 109 is closed.

7.5.2.2.3.9.2.5 IEEE Std. 603-1991, Clause 5.6, Independence

In Section 7.5.2.2.3.9.2.5 of SSER 23, issued July 2011, the NRC staff concluded that the Common Q PAMS meets the acceptance criteria for independence and the requirements of Clause 5.6; therefore, the PAMS is acceptable.

Core exit thermocouples (CETs) are bundled together with the non-Class 1E self-powered neutron detectors in the mineral insulated cable and thus do not meet the separation requirements between safety- and nonsafety-related equipment in IEEE Std. 384-1981, 'IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits.' The NRC staff documented its separation/isolation evaluation for the CETs in Section 7.7.1.9 of SSER 24, issued September 2011.

7.5.2.3 High-Range Containment Area Radiation Monitors

Disposition of Open Items (Appendix HH)

Open Item 78

Open Item 78 states, 'TVA intends to issue a revised calculation reflecting that the TID [total integrated dose] in the control room is less than 1×103 rads, which will be evaluated by the NRC staff.'
TVA's letter dated August 4, 2011 (ADAMS Accession No. ML11222A113), responded to the open item, and Enclosure 1 to the letter provided TVA's supporting calculation (Calculation No. WBNAPS3-127, Revision 0). TVA stated that the TID for the main control room, where the radiation monitors are located,

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			is 362.76 rads. This radiation dose is acceptable to the NRC staff for mild environments according to the guidance in RG 1.209. Based on its review of the information provided in TVA's letter dated August 4, 2011, and the calculation summary, the staff concluded that TVA provided an adequate response. Therefore, Open Item 78 is closed." SSER25 shows the status for this item as "Open (Inspection)."
7.7.1	25	O 08	Approved for both units in SER. REVISION 07 UPDATE : [portions from SSER23] 7.7.1.4.4.1 includes: "One aspect of the analysis that has not yet been confirmed by TVA is the ability of the network to sustain a data storm event without experiencing a plant upset, as necessary to verify compliance with Clause 6.3 of IEEE Std. 603-1991. In Enclosure 2 of its letter dated August 11, 2010 (ADAMS Accession No. ML102240384), TVA stated the following: A network data storm test will be performed with the system installed and prior to final commissioning. The test will confirm that the system will continue to function with a failed communication network without any plant upset. TVA should confirm to the NRC staff the completion of the data storm test on the DCS. This is Open Item 83 (Appendix HH)." 7.7.1.4.5 (Conclusion) reads: The NRC staff reviewed the WBN Unit 2 DCS as described in FSAR Amendments 96 through 103. Based on its review, the staff concludes that the information provided in FSAR Section 7.7.1.11 meets the relevant regulatory requirements identified in SRP Section 7.7, Revision 5, including 10 CFR 50.55a(a)(1), GDC 1, and GDC 13. The staff also concludes that TVA's analysis shows that the new DCS is consistent with Clause 6.3 of IEEE Std. 603-1991 and does not introduce any new failures, or change the probability or consequences of existing failures, not already addressed in the FSAR safety analyses. Additional evaluation by the NRC staff regarding conformance with Clause 5.6.3 of IEEE Std. 603-1991 and GDC 24 is contained in Section 7.9 of this SSER. SSER23 shows the status for this item as "Open (NRR)." Open Item 83 (Appendix HH) reads as follows: "TVA should confirm to the NRC staff the completion of the data storm test on the DCS. (Section 7.7.1.4)" [portions from SSER24] 7.7.1.9.2 includes: "The WINCISE system uses Optimized Proportional Axis Region Signal Separation Extended Life (OPARSSEL™) IITAs, containing five vanadium SPNDs and one CET. The individual vanadium emitter generates a signal proportional to the neutron flux activation at its specific location. Within an IITA, each

* = See last page for status code definition.

vanadium emitter has a different length to allow the IITA to measure the axial power distribution in five segments (i.e., each segment of detector has a different length that permits measurement of a different axial core segment). If an individual SPND were to fail, the BEACON system will continue to perform, but with a decreased axial resolution of the core power measurement within the assembly. The other vanadium detectors within the IITA would still be deemed operable. TVA should provide to the NRC staff a description of how the other vanadium detectors within the IITA would be operable following the failure of an SPND. This is Open Item 118 (Appendix HH). The extension member for each detector within the IITA ensures that all five vanadium detectors and the CET have an appropriate length to correctly locate them within the IITA."

7.7.1.9.5 includes:

"Westinghouse document WNA-DS-01811-WBT, Revision 0, 'WINCISE Signal Processing System Design Requirements,' which the NRC staff reviewed during audits conducted on June 28–29 and July 15, 2011, at the Westinghouse Electric Corporation office in Rockville, MD (audit report at ADAMS Accession No. ML112092667; not publicly available), required a power supply of 120 volts alternating current (VAC) ±10 percent for the SPS cabinet. Based on this requirement, Westinghouse determined the maximum overvoltage or surge voltage to be 264 VAC based on the information provided for the Quint power supplies to be installed in the SPS cabinet, as well as taking into account the maximum supply voltage of 220 VAC, even though the 120-VAC, Class 1E bus feeding the SPS cabinet is employed. The NRC staff evaluated the Westinghouse analysis performed to demonstrate how the SPS design meets the isolation requirements. Calculation Note WNA-CN-00157-WBT, Revision 0, 'Watts Bar 2 Incore Instrumentation System Signal Processing System Isolation Requirements,' summarizes this analysis. The NRC staff reviewed this calculation note during audits conducted on June 28–29 and July 15, 2011, at the Westinghouse Electric Corporation office in Rockville, MD (audit report at ADAMS Accession No. ML112092667; not publicly available). TVA should submit WNA-CN-00157-WBT to the NRC by letter to establish the record of the NRC staff's basis and its conclusions. This is Open Item 119 (Appendix HH).

The analysis showed that a surge voltage or overvoltage could originate from the SPS cabinet power supply, the 120-VAC, Class 1E power supply bus, ethernet communication, or cable voltage buildup. The analysis stated that the maximum overvoltage or surge voltage that could affect the system was 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC. TVA should confirm to the NRC staff that the maximum overvoltage or surge voltage that could affect the system is 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC. This is Open Item 120 (Appendix HH).

The analysis assumed that testing was performed for the IITA assembly, and the MI cable could withstand an overvoltage or surge voltage not greater than 600 volts direct current (Vdc). The analysis showed that no credible source of faulting can negatively impact the CETs or PAMS train. The NRC staff should confirm by review of WNA-CN-00157-WBT, Revision 0, that no credible source of faulting can negatively impact the CETs or PAMS train. Open Item 119 (Appendix HH) includes this issue.

As mentioned above, WNA-CN-00157-WBT, Revision 0, requires that the IITA assemblies and MI cable be tested for overvoltage and surge voltage of up to 600 Vdc. In a letter from R.W. Morris to D. Menard (LTR-ME-10-3, 'Watts Bar 2 Incore Instrumentation System Dielectric Characteristics of Completed MI Cable Assemblies,' dated January 11, 2010), which the NRC staff reviewed during audits conducted on June 28–29 and July 15, 2011, at the Westinghouse Electric Corporation office in Rockville, MD (audit report at ADAMS Accession No. ML112092667; not publicly available), Westinghouse summarized the evaluation performed to determine whether the MI cable could withstand an overvoltage and surge voltage of up to 600 Vdc. The NRC staff reviewed LTR-ME-10-3 and confirmed that all 58 1-to-2 transition cable assemblies were subjected to and successfully passed a 600-Vdc dielectric strength test. Since Westinghouse has only tested the MI cable, the same evaluation should be performed for the IITA assembly. This is Open Item 121 (Appendix HH), pending TVA submittal of the test results for the IITA assembly for NRC staff review.

Assuming satisfactory completion of the open items described above, the NRC staff concludes that the TVA analysis of the maximum credible overvoltage or surge voltage that can propagate from the non-Class 1E power supplies in the SPS cabinets to the SPND input signals is adequate. TVA also demonstrated that the MI cable and the IITA assembly can withstand overvoltage and surge voltage equal to 600 Vdc. Thus, the MI cable design allows for the isolation of the Class 1E CETs and non-Class 1E SPND signals. This hardware analysis requirement satisfies the requirements for testing or analysis of

associated circuit interaction with Class 1E circuits contained in IEEE Std. 384-1981 for overvoltage conditions.

To further mitigate the possibility of a transient surge voltage condition in the SPS cabinet's input power supply in excess of the identified maximum overvoltage value that might disable both divisions of the CET signals used by the PAMS, different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. Specifically, the power supply routed to PAMS train A is the same as that routed to SPS cabinet 1, and the power supply routed to PAMS train B is the same as that routed to SPS cabinet 2. TVA should confirm to the NRC staff that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. This is Open Item 122 (Appendix HH)."

AND

"Further, after the seal table, the MI cable configuration is a Y split, and the SPND signals are routed to SPS cabinets 1 and 2. The Y split separates the Class 1E CET signal from the associated SPND cabling. The SPS cabinet digitizes the SPND signal. The system performs periodic automatic diagnostic testing to confirm SPND signal quality. One of these tests is a leakage resistance determination. If the SPND does not pass this test, the system will assign a data quality value to notify the power distribution calculation software to disregard data from this SPND. TVA should explain to the NRC staff how the system will assign a data quality value to notify the power distribution calculation software to disregard data from a failed SPND. This is Open Item 123 (Appendix HH).

The digitized SPND signal is then transferred to the WINCISE application servers, integrated computer system (ICS), and BEACON. The SPS transfers digitized SPND signals to the BEACON ovation data highway, where the BEACON datalink collects the data. The ICS provides plant conditions for the BEACON to use in calculating core power distribution. The WINCISE nonsafety-related internet protocol switches provide the main hub for traffic flow from the SPS cabinets, BEACON servers, WINCISE application servers, and the ICS. In its letter dated April 15, 2011 (ADAMS Accession No. ML11136A053), TVA explained that transmission of information from BEACON or SPS cabinets to the ICS is only done via the WINCISE application servers. While the BEACON datalink on the application server can connect to either BEACON machine, only BEACON A is used for communication. TVA should clarify to the NRC staff whether automatic switchover to the other server is permitted. This is Open Item 124 (Appendix HH)."

AND

"Equipment Qualification

The WINCISE is a nonsafety-related system; only the IITA assembly and the MI cable are safety related. The SPND signals are considered quality related, and the CETs are safety related. Because these signals are bundled together in the IITA, as previously described, all MI cables and IITA connectors provided are environmentally qualified and Class 1E qualified. TVA should clarify to the NRC staff the type of connector used with the MI cable in WBN Unit 2 and which environmental qualification test is applicable. This is Open Item 125 (Appendix HH). To enable the NRC staff to evaluate and review the IITA environmental qualification, TVA should also provide the summary report of the environmental qualification for the IITA. This is Open Item 126 (Appendix HH).

In Attachment 8 to its letter dated May 6, 2011 (ADAMS Accession No. ML11129A205), TVA submitted the Westinghouse report, DAR-ME-09-10, Revision 0, 'Qualification Summary Report for the WINCISE Cable and Connector Upgrade at Watts Bar Unit 2.' This report summarizes the environmental and seismic/structural qualification of the MI cable, in accordance with IEEE Std. 323-1974, 'IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations,' and IEEE Std. 344-1975, 'IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations,' including NUREG-0588, Revision 1, 'Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment.' This report identifies similarity analysis as the method of qualification. The report shows that the tested MI cable fulfilled the electrical operability acceptance criteria throughout all phases of testing and met the specified WBN Unit 2 environmental parameters and inputs. In addition, the MI cable is qualified for the Class 1E application. TVA should provide a summary to the NRC staff of the electromagnetic interference/radiofrequency interference testing for the MI cable electromagnetic compatibility (EMC) qualification test results. This is Open Item 127 (Appendix HH).

The thermocouple cables, connectors, and cables outside the containment are part of the Westinghouse Common Q PAMS cabinet qualification. Section 7.5.2.2 of SSER 23 discusses this qualification.

As previously described, the SPS cabinets are used for conditioning and processing of low-current signals from in-containment neutron flux monitors. The SPS cabinets do not perform any direct Class 1E function and are classified as non-Class 1E. However, because the SPS cabinets are being installed in the reactor building (a seismic Category I structure), the SPS must be qualified in accordance with RG 1.100, Revision 3, 'Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants,' issued September 2009;, IEEE Std. 344-1975; and IEEE Std. 344-1987, 'IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations.' Specifically, the SPS cabinet must be able to withstand the effects of five operational basis earthquakes and one safe-shutdown earthquake without the loss of physical integrity or creation of missile hazards. The NRC staff reviewed the summary description provided in Attachment 5 of TVA's letter dated June 10, 2011 (ADAMS Accession No. ML11167A110). TVA stated that the cabinet maintained structural integrity without any component detachment throughout the test program and thus complies with the WBN Unit 2 seismic qualification specification, WB-DC-40-31.2, Revision 8, 'Watts Bar Nuclear Plant Seismic Qualification of Category 1 Fluid System Components and Electrical or Mechanical Equipment,' with testing performed in accordance with RG 1.100, IEEE Std. 344-1975, and IEEE Std. 344-1987. TVA should submit the seismic qualification test report procedures and results for the SPS cabinets to the NRC staff for review. This is Open Item 128 (Appendix HH)."

AND

"Specifically, WNA-CN-00157-WBT requires the analysis to demonstrate that surge events up to 4 kilovolts (kV) on the WINCISE SPS alternating current (ac) power feed into the cabinet could not propagate through the cabinet. Westinghouse performed an analysis to evaluate this fault. WNA-CN-00157-WBT, Revision 0, summarizes the results of the Westinghouse analysis. This analysis demonstrated that no credible source of faulting of a 600-Vdc limit can negatively affect the PAMS. This analysis identified a Westinghouse open item requiring the Quint power supply (to be installed in the SPS cabinet) to undergo EMC testing of 4 kV to validate the assumptions made in the Westinghouse analysis. TVA should verify to the NRC staff resolution of the open item in WNA-CN-00157-WBT, which requires the Quint power supply (to be installed in the SPS cabinet) to undergo EMC testing of 4 kV to validate the assumptions made in the Westinghouse analysis. This is Open Item 129 (Appendix HH). For additional information about the Westinghouse analysis, refer to the evaluation of IEEE Std. 384 described above in this SSER section entitled "Separation/Isolation Evaluation."

The acceptance criteria for the surge tests require that the 24-Vdc cabinet electronics do not suffer damage during surge events. As long as this requirement is maintained, any surge propagation into the cabinet will remain far less than the 600-Vdc limit. In Attachment 5 of its letter dated June 10, 2011 (ADAMS Accession No. ML11167A110), TVA provided a summary of the environmental qualification. This summary states that the SPS cabinet successfully complied with the emissions requirements of RG 1.180, Revision 1, "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems," issued October 2003. TVA should provide a summary to the NRC staff of the EMC qualification test results of the SPS cabinets. This is Open Item 130 (Appendix HH)."

AND

"RG 1.97 identifies the necessary range of the CETs as 200 to 2,300 degrees F, which is the same range described in the WBN Unit 2 FSAR. However, as described previously, because of the new CET location and IITA configuration, the CETs in WBN Unit 2 can differ from the CETs in WBN Unit 1 by up to 15 degrees F under certain accident scenarios. In its letter dated June 23, 2011, TVA explained that, during accident conditions in which the reactor coolant pumps are operating, the water mixing and travelling through the fuel element channels in which the IITA guides (and thus the CETs) are located will cause the temperature seen by WBN Unit 2 to be lower than the temperature indicated for WBN Unit 1. The emergency operating procedure (EOP) for WBN Unit 2 should consider this difference in temperature. As a result, TVA should review the EOP action level setpoint to account for this difference between core exit temperature readings for WBN Unit 1 and Unit 2 and confirm the EOP action level setpoint to the NRC staff. This is Open Item 131 (Appendix HH)."

7.7.1.9.6 (Conclusion) reads:

"Based on the above, the NRC staff concludes that the IIS complies with the acceptance criteria of SRP

Section 7.7, Revision 5; BTP 7-19, Revision 5; RG 1.97, Revision 2; and RG 1.75, Revision 2, and therefore meets the requirements of 10 CFR 50.55a(a)(1), 10 CFR 50.55a(h), GDC 13, and GDC 24. Therefore, the WBN Unit 2 IIS is acceptable."

7.7.1 ends with:

"Conclusion

Based on its review of the information provided by TVA, as described above, the NRC staff concluded that TVA adequately addressed the aging degradation of the materials used in the IITAs. Since aging degradation due to wear does not occur in IITAs, and any breach of the IITAs does not result in loss of RCS pressure boundary, the NRC staff concludes that the IITAs do not require routine inspections under TVA's plant maintenance program. Therefore, the NRC staff concludes that TVA has adequately addressed the issue of aging degradation of the materials used in IITAs in the WINCISE system and meets the requirements of GDC 10."

SSER24 shows the status for this item as "Open (NRR)."

Open Item 118 (Appendix HH) reads as follows:

"TVA should provide to the NRC staff a description of how the other vanadium detectors within the IITA would be operable following the failure of an SPND. (SSER 24, Section 7.7.1.9.2)"

Open Item 119 (Appendix HH) reads as follows:

"TVA should submit WNA-CN-00157-WBT, Revision 0, to the NRC by letter. The NRC staff should confirm by review of WNA-CN-00157-WBT, Revision 0, that no credible source of faulting can negatively impact the CETs or PAMS train. (SSER 24, Section 7.7.1.9.5)"

Open Item 120 (Appendix HH) reads as follows:

"TVA should confirm to the NRC staff that the maximum over-voltage or surge voltage that could affect the system is 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC. (SSER 24, Section 7.7.1.9.5)"

Open Item 121 (Appendix HH) reads as follows:

"TVA should submit the results to the NRC staff of a 600 VDC dielectric strength test performed on the IITA assembly. (SSER 24, Section 7.7.1.9.5)"

Open Item 122 (Appendix HH) reads as follows:

"TVA should confirm to the NRC staff that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. (SSER 24, Section 7.7.1.9.5)"

Open Item 123 (Appendix HH) reads as follows:

"TVA should provide an explanation to the NRC staff of how the system will assign a data quality value to notify the power distribution calculation software to disregard data from a failed SPND. (SSER 24, Section 7.7.1.9.5)"

Open Item 124 (Appendix HH) reads as follows:

"While the BEACON datalink on the Application server can connect to either BEACON machine, only BEACON A is used for communication. TVA should clarify to the NRC staff whether automatic switchover to the other server is not permitted. (SSER 24, Section 7.7.1.9.5)"

Open Item 125 (Appendix HH) reads as follows:

"TVA should provide clarification to the NRC staff of the type of connector used with the MI cable in Unit 2, and which EQ test is applicable. (SSER 24, Section 7.7.1.9.5)"

Open Item 126 (Appendix HH) reads as follows:

"To enable the NRC staff to evaluate and review the IITA environmental qualification, TVA should provide the summary report of the environmental qualification for the IITA. (SSER 24, Section 7.7.1.9.5)"

Open Item 127 (Appendix HH) reads as follows:

"TVA should provide a summary to the NRC staff of the electro-magnetic interference/radio-frequency interference (EMI/RFI) testing for the MI cable electro-magnetic compatibility (EMC) qualification test results. (SSER 24, Section 7.7.1.9.5)"

Open Item 128 (Appendix HH) reads as follows:

"TVA should submit the seismic qualification test report procedures and results for the SPS cabinets to the NRC staff for review. (SSER 24, Section 7.7.1.9.5)"

Open Item 129 (Appendix HH) reads as follows:

"TVA should verify to the NRC staff resolution of the open item in WNA-CN-00157-WBT for the Quint power supply (to be installed in the SPS cabinet) to undergo EMC testing of 4 kV to validate the assumptions made in the Westinghouse analysis. (SSER 24, Section 7.7.1.9.5)"

Open Item 130 (Appendix HH) reads as follows:

"TVA should provide a summary to the NRC staff of the EMC qualification test results of the SPS cabinets. (SSER 24, Section 7.7.1.9.5)"

Open Item 131 (Appendix HH) reads as follows:

"TVA should review the EOP action level setpoint to account for the difference between core exit temperature readings for Unit 1 and Unit 2 and confirm the EOP action level setpoint to the NRC staff. (SSER 24, Section 7.7.1.9.5)"

REVISION 08 UPDATE:

7.7.1.9 of SSER25 reads:

"7.7.1.9 In-Core Instrumentation System

Disposition of Open Items (Appendix HH)

Open Item 119

Open Item 119 states, 'TVA should submit WNA-CN-00157-WBT, Revision 0, to the NRC by letter. The NRC staff should confirm by review of WNA-CN-00157-WBT, Revision 0, that no credible source of faulting can negatively impact the CETs or PAMS train.'

In Enclosure 1 and in Attachment 2 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA responded to this open item. Attachment 2 included a copy of Westinghouse analysis WNA-CN-00157-WBT, Revision 0, 'Watts Bar 2 Incore Instrument System (IIS) Signal Processing System (SPS) Isolation Requirements.' The analysis shows the following:

1. No fault originating either within the WINCISE (Westinghouse INCore Information, Surveillance, and Engineering system) signal processing system (SPS) cabinet or electrical surges on the input power lines or output communications link can result in fault voltage affecting CET signals.

2. Inadvertent disconnection or failures of any IITA (in-core instrumentation thimble assembly) emitter wire or wires at the WINCISE SPS cabinet, or anywhere in the cabling between the IITA seal table connector and the WINCISE SPS cabinet, will not cause voltage charge-up on the emitter wire to exceed 600 volts direct current during worst case (full-power) plant operation, thus preventing the fault voltage from affecting the associated CET.

3. For large input overvoltage conditions on the 120-volt alternating current (Vac) input instrument bus used in both the SPS cabinet and associated PAMS train, the SPS will not cause any failure within the PAMS train that would not otherwise occur as a direct result of the overvoltage condition within the PAMS power supply.

The impact of a failed CET on a PAMS channel is addressed in Westinghouse analysis WNA-AR-00180-WBT-P, Revision 2, 'Failure Modes and Effects Analysis (FMEA) for the Post Accident Monitoring System,' page 3-6, in TVA's letter dated March 2, 2011 (ADAMS Accession No. ML110620411).

Based on the analysis results, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 119 is closed.

Open Item 120

Open Item 120 states, 'TVA should confirm to the NRC staff that the maximum over-voltage or surge voltage that could affect the system is 264 VAC, assuming that the power supply cable to the SPS cabinet is not routed with other cables greater than 264 VAC.'

In Enclosure 1 and in Attachments 2 and 5 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA responded to this open item. The information provided by TVA confirms that 264 Vac is the estimated maximum voltage, or surge-voltage, that could affect WINCISE. Furthermore, the equipment qualification for the WINCISE SPS, provided in Attachment 5, shows that the SPS cabinets can withstand a maximum surge of 4,000 volts with no loss of function after the surge.
However, TVA's response did not confirm that the power supply cable to the WINCISE SPS cabinet would not be routed with other cables carrying greater than 264 Vac. TVA must confirm that the power supply cable to the SPS cabinet is not routed with other cables with voltage greater than 264 Vac. Open Item 120 remains open.

Open Item 122

Open Item 122 states, 'TVA should confirm to the NRC staff that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits.'

In Enclosure 1 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA confirmed that different divisions of safety power are supplied to the IIS SPS cabinets, with the power cables routed in separate shielded conduits. Therefore, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 122 is closed.

Open Item 124

Open Item 124 states, 'While the BEACON datalink on the Application server can connect to either BEACON machine, only BEACON A is used for communication. TVA should clarify to the NRC staff whether automatic switchover to the other server is not permitted.'

In Enclosure 1 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA explained that the feature to automatically switch over to BEACON B is not configured for WBN Unit 2, and the BEACON datalink on the application server can only connect to BEACON A. TVA provided further information in Attachment 3 to its letter dated June 10, 2011 (ADAMS Accession No. ML11167A110). The NRC staff reviewed the information provided in TVA's letters dated June 10 and September 1, 2011, and concluded that its response was acceptable. Therefore, Open Item 124 is closed.

Open Item 128

Open Item 128 states, 'TVA should submit the seismic qualification test report procedures and results for the SPS cabinets to the NRC staff for review.'

In Enclosure 1 and in Attachment 5 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA responded to this open item. Attachment 5 includes a copy of the Westinghouse report EQ-QR-39-WBT, Revision 0, 'Equipment Qualification Summary Report for WINCISE Signal Processing System.' This summary report describes the seismic qualification test performed and the results obtained. The WINCISE SPS cabinet maintained structural integrity without any component detachment throughout the test program and thus complied with WBN Unit 2 seismic qualification specification WB-DC-40-31.2, with testing performed in accordance with NRC RG 1.100, IEEE Std. 344-1975, and IEEE Std. 344-1987, 'IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations.' Based on the information in the summary report, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 128 is closed.

Open Item 130

Open Item 130 states, 'TVA should provide a summary to the NRC staff of the EMC [electromagnetic compatibility] qualification test results of the SPS cabinets.'

In Enclosure 1 and in Attachment 5 to its letter dated September 1, 2011 (ADAMS Accession No. ML11257A048), TVA responded to this open item. Attachment 5 includes a copy of the Westinghouse report EQ-QR-39-WBT, Revision 0, 'Equipment Qualification Summary Report for WINCISE Signal Processing System.' This summary report describes the EMC qualification test performed and the results obtained. The report states that the WINCISE SPS cabinet successfully complied with the emissions requirements of NRC RG 1.180, Revision 1, 'Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems,' and the supplemental-surge-withstand testing required in WNA-CN-00157-WBT. Therefore, the NRC staff concludes that TVA adequately addressed the issue, and Open Item 130 is closed."

SSER25 shows the status for this item as "Open (NRR)."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
7.9.0	23	O 08	Area not addressed in 1981 Standard Review Plan. REVISION 07 UPDATE: 7.9.4 (Conclusion) of SSER23 reads: "Based on the NRC staff's review of the interfaces between the data communication systems and plant systems described in WBN Unit 2 FSAR Amendment 103, as supplemented by the TVA documents referenced above, the staff concludes that the data communication systems meet the relevant acceptance criteria identified in SRP Section 7.9, Revision 5, including the requirements of IEEE Std. 603-1991, Clause 5.6.3, and GDC 24 with regard to control and protection system interactions." SSER23 DID NOT PROVIDE A STATUS; VERBIAGE SUGGESTS THE STATUS WOULD BE "RESOLVED." REVISION 08 UPDATE: 7.9.3.2 of SSER23 includes: "However, the NRC staff was not able to confirm that sufficient testing was performed to demonstrate that two-way communication was precluded by the specific configuration changes described above. TVA should confirm to the staff that testing has sufficiently demonstrated that two-way communication is precluded with the described configurations. This is Open Item 93 (Appendix HH)."
11.3.0	25	C 08	In the SER, the staff identified that the hydrogen and oxygen monitoring system did not meet the acceptance criteria because redundant monitors had not been provided and because the system was not designed to automatically initiate action to mitigate the potential for explosion in the event of high oxygen content. This issue was addressed by Technical Specifications discussed in the original SER and in SSER8 but was later resolved in SSER16. Based upon NRC review of TVA's February 17, 1995, letter (submitted on both dockets), the staff accepted the WBN's system approach of preclusive of gas buildup, as allowed by SRP Section 11.3 guidelines, if TVA submitted an administrative program to satisfy administrative controls for TS 5.7.2.15, "Explosive Gas and Storage Tank Radioactivity Monitoring Program." As stated in TVA's letter dated July 21, 1995, the program would provide for monitoring and control of potential explosive mixtures, limit the concentration of oxygen, and surveillance to ensure that the limits are not exceeded. As a result of an SSER16 review, the staff concluded that the GWMS for Watts Bar Units 1 and 2 met the acceptance criteria of SRP Section 11.3 and was acceptable. REVISION 07 UPDATE: 11.3 of SSER24 reads: "Both TVA's and the staff's calculations indicate that the design objectives in Sections II.A, II.B, and II.C of Appendix I to 10 CFR Part 50 are met. However, the calculations do not support a conclusion that the criteria for gaseous effluents in RM 50-2, and thus Section II.D of Appendix I, are met. As noted in SSER Section 11.0 above, TVA has committed to demonstrating compliance with the dose-based criteria in RM 50-2, in lieu of providing a WBN liquid and gaseous effluent systems cost-benefit analysis. Specifically, Table 11.3-3 of this SSER indicates that the calculated maxim organ dose from the operation of two reactor units at the WBN site would be in excess of 18 mrem. This result does not meet Criterion C.1 in RM 50-2 for gaseous effluent releases of 15 mrem per year to the maximally exposed organ 'from all light-water-cooled nuclear power reactors at a site.' Section II.D of Appendix I to 10 CFR Part 50 states, 'In addition to the provisions of paragraphs A, B, and C above, the applicant shall include in the radwaste

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system all items of reasonably demonstrated technology that, when added to the system sequentially and in order of diminishing cost-benefit return, can for a favorable cost-benefit ratio effect reductions in dose to the population reasonably expected to be within 50 miles of the reactor.' TVA has not provided the analysis required by Section II.D of Appendix I to 10 CFR Part 50. TVA must demonstrate through a cost-benefit analysis that reasonable changes to the design of the WBN gaseous effluent processing systems would not sufficiently reduce the collective dose to the public within a 50-mile radius. Therefore, the staff cannot conclude that the doses to members of the public from effluent releases during the normal operation of WBN will be ALARA. This is Open Item 135 (Appendix HH)."

SSER24 shows the status for this item as "Open (NRR)."

Open Item 135 (Appendix HH) reads as follows:

"TVA has not provided the analysis required by 10 CFR Part 50, Appendix I, subsection II.D. TVA must demonstrate with a cost-benefit analysis that a sufficient reduction in the collective dose to the public within a 50-mile radius would not be achieved by reasonable changes to the design of the WBN gaseous effluent processing systems. (SSER 24, Section 11.3)"

TVA to NRC letter dated July 28, 2011 (ADAMS Accession Number ML11213A261), "Watts Bar Nuclear Plant (WBN) Unit 2 – Results from Cost-Benefit Analysis of Radwaste System Enhancements," included the following:

"The purpose of this letter is to provide a summary of the results of a cost-benefit study of enhancements to the WBN Unit 2 radwaste systems as committed to Reference 1.

Reference 2 Section II.D requires the preparation of a cost-benefit analysis to determine if enhancements to a plant's radwaste system should be incorporated into the plant design as part of applying the as low as reasonably achievable philosophy to normal plant releases of radiation. The cost-benefit analysis was prepared in accordance with the regulatory positions in Reference 3.

The analysis concluded that none of the enhancements evaluated were cost-beneficial and should be added to the WBN Unit 2 design. The enclosure provides the details from the cost-benefit analysis."

See the letter for the References.

REVISION 08 UPDATE:

The Conclusions portion of 11.3 of SSER25 included:

"Based on the NRC staff's evaluation, as documented in SSER 24, and the results of the cost-benefit analysis, the staff concludes that the WBN effluent systems can maintain gaseous releases within the design objectives in 10 CFR Part 50, Appendix I, Sections II.A, II.B, and II.C, and are as low as is reasonably achievable, as required in 10 CFR Part 50, Appendix I, Section II.D. Therefore, Open Item 135 is closed. The results of the cost-benefit analysis required by 10 CFR Part 50, Appendix I, subsection II.D, should be provided in the WBN Unit 2 FSAR. Upon receipt of the updated FSAR, the NRC staff will confirm that the update has been made by TVA. This is Open Item 139 (Appendix HH)."

SSER25 shows the status for this item as "Resolved."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
11.5.0	24	C 08	In SSER16, the staff updated its review to Amendment 89, and TVA's submittal dated February 17, 1995. The staff concluded that the process and effluent radiological monitoring and sampling system for Watts Bar Unit 1 complied with 10 CFR 20.1302 and GDCs 60, 63, and 64. The staff also concluded that the system design conformed to the guidelines of NUREG-0737, RGs 1.21 and 4.15, and applicable guidelines of RG 1.97 (Rev. 2). Thus, the system met the acceptance criteria of SRP Section 11.5 and was, therefore, acceptable. In SSER20, the staff agreed that TVA did not commit to RG-4.15, Revision 1 as reflected in TVA's July 21, 1995 letter. In that letter, TVA had stated that the radiation monitoring system generally agrees with and satisfies the intent of the RG 4.15 except for specific calibration techniques and frequencies. The staff then reiterated its earlier finding stated in SSER16, Section 11.5.1, that the radiation monitoring system for Watts Bar Unit 1 meets the intent and purpose of RG 4.15, with respect to quality assurance provisions for the system. The staff modified one sentence from SSER16 and then concluded by stating that the other conclusions given in SSER16 continued to be valid. Unit 2 Action: Provide system description and information on QA provisions for the Unit 2 Radiation Monitoring System. --- --- REVISION 07 UPDATE: 11.5 of SSER24 reads: "Because no substantive differences between the two units exist in regard to the design and operation of the process and effluent radiological monitoring and sampling system, the NRC staff concludes that the system at WBN Unit 2 meets the requirements in GDC 60, GDC 63, and GDC 64 of Appendix A to 10 CFR Part 50 and the guidelines in RG 1.21, Revision 1; RG 1.97, Revision 2; and the intent and purpose of RG 4.15, Revision 1, and that it is therefore acceptable." SSER24 shows the status for this item as "Resolved." --- --- REVISION 08 UPDATE: "TVA to NRC letter dated December 22, 2011 provided response to Instrumentation and Controls Staff Information Requests. The response to item 6 read as follows: 'TVA Response TVA does not publish a system description document for the Radiation Monitoring system. The information requested is contained in TVA design criteria document WB-DC-40-24, 'Radiation Monitoring (Unit 1/Unit 2).' The document was recently revised to reflect the Unit 2 design. Attachment 8 contains TVA design criteria document WB-DC-40-24, 'Radiation Monitoring (Unit 1/Unit 2)," Revision 24, dated November 30, 2011.'"
13.1.3	25	C 08	LICENSE CONDITION – Use of experienced personnel during startup In the original 1982 SER, NRC provided a LICENSE CONDITION to ensure TVA augmented the shift staff with individuals that had prior experience with large pressurized water reactor operations. In SSER8, NRC reviewed TVA's commitment in the FSAR and the Nuclear Quality Assurance Plan to comply with RG 1.8, "Personnel Selection and Training,". NRC staff considered that this provided adequate assurance, and eliminated the LICENSE CONDITION. Unit 2 Action: Submit staffing and NQAP for two unit operation. ---

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REVISION 06 UPDATE:

Section 13.1.3 includes:

"In order to complete its evaluation of TVA's plant staff organization, TVA should provide information to the NRC staff to allow the staff to confirm that:

1) The education and experience of management and principal supervisory positions down through the shift supervisory level conform to RG 1.8. The staff will review the resumes to confirm this.

2) TVA has an adequate number of licensed and non-licensed operators in the training pipeline to support the preoperational test program, fuel loading, and dual unit operation.

3) The plant administrative procedures clearly state that when the Assistant Shift Engineer assumes his duties as Fire Brigade Leader, his control room duties are temporarily assumed by the Shift Supervisor (Shift Engineer), or by another SRO, if one is available. The staff will confirm that the plant administrative procedures clearly describe this transfer of control room duties.

These are Open Items 9, 10, and 11 (Appendix HH)."

SSER22 shows the status for this item as "Open (NRR)."

Per TVA letter to NRC dated April 6, 2011, Open Items 9 and 11 are for NRC Inspection / Review.

REVISION 08 UPDATE:

13.1.3 of SSER25 reads:

"13.1.3 Plant Staff Organization

Disposition of Open Items (Appendix HH)

Open Item 11 (Appendix HH) states the following:

The plant administrative procedures should clearly state that, when the Assistant Shift Engineer assumes his duties as Fire Brigade Leader, his control room duties are temporarily assumed by the Shift Supervisor (Shift Engineer), or by another SRO [senior reactor operator], if one is available. The plant administrative procedures should clearly describe this transfer of control room duties.

In Enclosure 1 of its letter dated August 15, 2011 (Agencywide Documents Access and Management System Accession No. ML11230A385), the Tennessee Valley Authority provided its revised Watts Bar Nuclear Plant Unit 1/Unit 2 as-designed fire protection report. The U.S. Nuclear Regulatory Commission staff reviewed Section 9.1, 'Fire Brigade Staffing,' of the fire protection report and concluded that, because it ensures that the fire brigade will not use members of the minimum shift crew, there is no need for an administrative procedure to describe a transfer of control room duties. Therefore, Open Item 11 is closed. "

SSER25 shows the status for this item as "Resolved."

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
13.3.2	22	CO 08	In SSER13, NRC reviewed the Watts Bar Nuclear Plant Radiological Emergency Plan submitted February 12, 1993. This review superseded the review in the SER. In SSER13, the staff concluded that the WBN Radiological Emergency Plan (REP) provided an adequate planning basis for an acceptable state of onsite emergency preparedness. In SSER20, NRC completed the review and found that the REP complied with NRC requirements and was acceptable for the full-power license of WBN Unit 1. Unit 2 Action: Submit WBN REP for two unit operation. --- --- REVISION 06 UPDATE: Section 13.3.2.18 of SSER22 includes: "Section V of Appendix E to 10 CFR Part 50 requires TVA to submit its detailed implementing procedures for its emergency plan no less than 180 days before the scheduled issuance of an OL. Completion of this requirement is an open item that must be resolved before the issuance of an OL. This is Open Item 43 (Appendix HH)." SSER22 shows the status for this item as "Open (NRR)." --- --- REVISION 08 UPDATE: 13.3.2 of SSER22 includes: "The NRC staff review documented in this SSER used Revision 92 of the NP-REP and the WBN Unit 1/2 version of Appendix C, designated as Revision 92xx. Unless otherwise stated, "WBN REP," as used in this supplement, refers to Revision 92 of the NP-REP and the WBN Unit 1/2 version of Appendix C, Revision 92xx. The staff has identified an open item to review the combined WBN Appendix C before issuance of the Unit 2 OL to confirm (1) that the proposed Unit 2 changes were incorporated into Appendix C and (2) that changes made to Appendix C for Unit 1 since Revision 92 and the changes made to the NP-REP since Revision 92 do not affect the bases of the staff's findings in this SER supplement. This is Open Item 37 (Appendix HH)." and "In its April 27, 2010, response to RAI 6, TVA stated that Unit 1 and Unit 2 will share a common control room, TSC, and OSC and that the Unit 1 communication facilities were originally designed and built to serve both units. As described in SSER 13, TVA's Central Emergency Control Center (CECC), located in Chattanooga, TN, serves as the EOF for Unit 1 and will serve as the EOF for Unit 2. TVA also stated in its response to RAI 7 that the Unit 2 design would provide plant data to the NRC's Emergency Response Data System (ERDS) as is currently done for Unit 1. The staff finds that no dual-unit or unit-specific changes are necessary to reflect Unit 2, in that the communication capabilities were originally designed and built to serve both units. The staff plans to confirm the availability and operability of the ERDS for Unit 2 before issuance of the Unit 2 OL. This is Open Item 38 (Appendix HH). The staff also plans to confirm the adequacy of the communications capability to support dual-unit operations before issuance of the Unit 2 OL. This is Open Item 39 (Appendix HH)." [13.3.2.6] and "In its April 27, 2010, response to RAI 8, TVA stated that Unit 1 and Unit 2 will share a common control room, TSC, OSC, and a local recovery center and that the Unit 1 facilities in place were originally designed and built to serve both units. As described in SSER 13, TVA's CECC, located in Chattanooga, TN, serves as the EOF for Unit 1 and will serve as the EOF for Unit 2. No dual-unit or unit-specific changes are necessary to reflect Unit 2, because that the facilities and equipment were originally

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			designed and built to serve both units. The staff should confirm the adequacy of the emergency facilities and equipment to support dual-unit operations before issuance of the Unit 2 OL. This is Open Item 40 (Appendix HH)." [13.3.2.8] and "In its April 27, 2010, response to RAI 9, TVA stated that Unit 1 and Unit 2 will share a common control room, TSC, and OSC and that the Unit 1 facilities in place were originally designed and built to serve both units. As described in SSER 13, TVA's CECC, located in Chattanooga, TN, serves as the EOF for Unit 1 and will serve as the EOF for Unit 2. TVA also committed to (1) updating plant data displays as necessary to include Unit 2 and (2) updating dose assessment models to provide capabilities for assessing releases from both WBN units. The staff plans to confirm the adequacy of these items before issuance of the Unit 2 OL. This is Open Item 41 (Appendix HH)." [13.3.2.9] and "Since these actions are currently in progress, the staff will confirm the adequacy of these assessment capabilities to support dual unit operations before issuance of the Unit 2 OL. This is Open Item 42 (Appendix HH)." [13.3.2.9] --- --- REVISION 08 UPDATE: NRC Inspection Report 391/2011-609 closed SSER (Appendix H) Open Items Number 39 and 42.
15.4.1	25	CO --- 08	In SSER5, NRC reviewed a change to the estimated fractions in leakage pathways for the release of radioactive material following a LOCA. In SSER9, NRC corrected the filter efficiency for organic iodine. The conclusions reached in the SER and supplements remained unchanged. In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. In FSAR amendment 90, TVA increased the amount of leakage that enters the auxiliary building following a LOCA. In SSER18, NRC confirmed this was within the guidelines of 10 CFR Part 100. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 08 UPDATE: 15.4.1 of SSER25 includes: "The NRC staff review concluded that the aforementioned unit-specific changes used to evaluate the WBN Unit 2 LOCA analysis are based on physical differences in the units, unit-specific operational differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences resulting from a postulated

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			LOCA at the EAB, LPZ, and CR comply with the reference values and the CR dose criterion provided in 10 CFR 100.11, 'Determination of Exclusion Area, Low-Population Zone, and Population Center Distance,' and in 10 CFR Part 50, 'Domestic Licensing of Production and Utilization Facilities,' Appendix A, 'General Design Criteria for Nuclear Power Plants,' General Design Criterion (GDC) 19, 'Control Room,' as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff's review concluded that TVA used analyses, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in Table 15.2 and TVA's calculated dose results in Table 15.1 of this SSER were acceptable. The NRC staff concludes that TVA's estimates of the dose consequences of a design-basis LOCA are in accordance with the SRP acceptance criteria." SSER25 shows the status for this item as "Resolved."
15.4.2	25	CO 08	In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. REVISION 08 UPDATE: 15.4.2 of SSER25 includes: "Iodine Spike Assumptions For Unit 2, the short-term maximum allowable dose equivalent iodine-131 (DEI) value is 14 microcuries/gram (µCi/gm). TVA has informed the NRC staff (reference Agencywide Documents Access and Management System (ADAMS) Accession No. ML11252A530) that it will submit a license amendment request to revise the Unit 1 technical specification (TS) short-term maximum allowable DEI from 21 µCi/gm to 14 µCi/gm. This change is necessary, since the dose conversion factors (DCFs) were changed from International Commission on Radiological Protection (ICRP)-2, 'Permissible Dose for Internal Radiation,' 1959, values to the values in RG 1.109, 'Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I,' Revision 1, issued October 1977. The Unit 1 TS require that RG 1.109 be used to determine the DEI. With this change, the short-term maximum allowable DEI value of 14 µCi/gm will be consistent for both WBN Unit 1 and Unit 2. The NRC staff has endorsed the use of the DCFs from RG 1.109 in dose consequence analyses." and "The NRC staff review found that the aforementioned unit-specific changes used to evaluate the WBN Unit 2 MSLB analysis are based on physical differences in the units, unit-specific operational differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences resulting from the postulated MSLB at the EAB, LPZ, and CR comply with the reference values and the CR dose criterion provided in 10 CFR 100.11 and 10 CFR Part 50, Appendix A, GDC 19, as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff concluded that TVA used analyses, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in Table 15.3 and TVA's calculated dose results given in Table 15.1 of this SSER were acceptable. The NRC staff concluded that TVA's estimates of the dose consequences of a design-basis MSLB are in

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			accordance with the SRP acceptance criteria. "
			SSER25 shows the status for this item as "Open (NRR)."
15.4.3	25	CO	LICENSE CONDITION – Steam Generator tube rupture
		08	In SSER2, NRC performed an initial evaluation of an actual Steam Generator Tube Rupture (SGTR) that occurred at Ginna. As part of the Westinghouse Owners Group (WOG), WBN committed to implement all corrective actions recommended by the WOG. In SSER5, NRC reviewed the WOG SGTR analysis and determined that plant specific information was required. In SSER12, the staff identified 5 items that required resolution involving 1) operator action times; 2) radiation offsite consequence analysis; 3) systems, 4) associated components credited for accident mitigation in SG tube rupture emergency operating procedures; and 5) system compatibility with bounding analysis. Items 2-5 were resolved in SSER12. In SSER14, the staff stated that a revised SG tube rupture analysis was more conservative and did not alter the conclusions of their Original safety evaluation. With regard to operator response times, TVA letters dated April 21, 1994, and August 15, 1994, and NRC letter dated June 28, 1994, dealt with simulator runs to address response times and operator performance during simulated SG tube ruptures. The staff concluded, after review of the TVA letters, that the times assumed in the tube rupture analysis were satisfactorily verified and deleted this condition. In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. --- --- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. --- --- REVISION 08 UPDATE: 15.4.3 of SSER25 includes: "The NRC staff review concluded that the aforementioned unit-specific changes used to evaluate the WBN Unit 2 SGTR analysis are based on physical differences in the units, unit-specific operational differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences resulting from the postulated SGTR at the EAB, LPZ, and CR comply with the reference values and the CR dose criterion provided in 10 CFR 100.11 and 10 CFR Part 50, Appendix A, GDC 19, as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff's review found that TVA used analysis, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in Table 15.4 and the TVA's calculated dose results given in Table 15.1 of this SSER were acceptable. The NRC staff concludes that TVA's estimates of the dose consequences of a design-basis SGTR are in accordance with the SRP acceptance criteria." SSER25 shows the status for this item as "Resolved."

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
15.4.4	25	CO 08	In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. REVISION 08 UPDATE: 15.4.4 of SSER25 includes: "The NRC staff evaluated the control rod ejection accident in Section 15.4.4 of the SER (NUREG-0847), and there have been no supplements to this section. The current WBN Unit 2 FSAR Section 15.5, 'Environmental Consequences of Accidents,' does not include a detailed evaluation of this accident except to state that it is bounded by the LOCA. The LOCA dose consequence results for WBN Unit 2 are less than 25 percent of the reference values in 10 CFR 100.11. Since the source term for a control rod ejection accident is considerably less than for a LOCA, and the dose consequence results for the WBN Unit 2 LOCA are less than the SRP acceptance criteria for a rod ejection accident (25 percent of the reference values in 10 CFR 100.11), the staff concludes that the dose consequence for the rod ejection accident will be bounded by the LOCA for WBN Unit 2." SSER25 shows the status for this item as "Resolved."
15.4.5	25	CO 08	In SSER4, NRC reevaluated the consequences of a fuel handling accident inside primary containment. NRC concluded WBN met the relevant requirements of GDC 61. In SSER15, NRC reviewed revised short term atmospheric relative concentration factors. The conclusions reached in the SER and supplements remained unchanged. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. REVISION 08 UPDATE: 15.4.5 of SSER25 includes: 15.4.5.1 "The NRC staff reviewed the unit-specific changes used to evaluate the RG 1.25 WBN Unit 2 FHA analysis and finds that these changes are based on physical differences in the units, unit-specific

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SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			operational differences, or updated information that has been accepted by the NRC staff for use in dose consequence analyses. The TVA evaluation concluded that the radiological consequences at the EAB, LPZ, and CR resulting from the postulated FHA inside containment, with the containment closed and the RBPVS operating, comply with the reference values and the CR dose criterion provided in 10 CFR 100.11 and 10 CFR Part 50, Appendix A, GDC 19, as well as with the accident-specific dose guidelines specified in the SRP. The NRC staff's review concluded that TVA used analyses, assumptions, and inputs consistent with those described in the SRP. The NRC staff concluded that the assumptions presented in Table 15.5 and TVA's calculated dose results given in Table 15.1 of this SSER were acceptable. The NRC staff concludes that TVA's estimates of the dose consequences of a design-basis FHA inside containment with the containment isolated and the RBPVS operating are in accordance with the SRP acceptance criteria." 15.4.5.2 "TVA considered the analysis of the FHA both within the containment and within the auxiliary building. The dropped fuel assembly inside the containment is assumed to occur with the equipment maintenance hatch fully open, and the fuel assembly drop inside the auxiliary building credits no filtration of the exhaust. A minimum water level of 23 feet above the damaged fuel assembly is maintained for release locations both inside containment and the auxiliary building. This minimum water covering acts as a barrier to many of the radionuclides released from the dropped assembly. TVA assumed retention of all noniodine particulates in the pool, while the iodine releases from the fuel gap into the pool are assumed to be decontaminated by an overall factor of 200. This DF results in 0.5 percent (i.e., 99.5 percent of the iodine is retained in the pool) of the radioiodine escaping the overlying water with a composition of 70-percent elemental and 30-percent organic iodine. In accordance with Regulatory Position 3 of RG 1.183, the applicant assumed that 100 percent of the noble gas activity is released from the pool. All fission products released to the environment are assumed to release over a 2-hour period. In the subject RG 1.183 FHA analysis, TVA does not credit dilution within the surrounding structures before release to the atmosphere. These assumptions follow the guidance of RG 1.183 and are, therefore, acceptable to the staff." 15.4.5.3 "TVA evaluated an FHA in the SFP area and in an open containment with no credit taken for the ABGTS or containment purge system filters and concluded that the radiological consequences at the EAB, outer boundary of the LPZ, and CR are within the reference values and the CR dose criterion provided in 10 CFR 50.67, 'Accident Source Term,' as well as the accident-specific dose guidelines specified in SRP Section 15.0.1. The staff's review concluded that TVA used analyses, assumptions, and inputs consistent with the regulatory guidance specified in RG 1.183 for the evaluation of an FHA using the AST. The staff concluded that the assumptions by TVA presented in Table 15.6 of this SSER were acceptable. Table 15.1 of this SSER gives TVA's calculated dose results. The staff concludes that the doses estimated by TVA for the WBN Unit 2 FHA will meet the requirements of 10 CFR 50.67 and the guidelines of RG 1.183 and are, therefore, acceptable." ---------- SSER25 shows the status for this item as "Resolved."
15.4.6	25	CO ---------- 08	Approved for both units in SER. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. ---------- ----------

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			REVISION 08 UPDATE: 15.4.6 of SSER25 states: "The NRC staff previously evaluated the failure of small lines carrying coolant outside containment in Section 15.4.6 of the SER (NUREG-0847). There have been no supplements to this section. The current WBN Unit 2 FSAR Section 15.5, 'Environmental Consequences of Accidents,' does not include an evaluation of this accident. In the analysis reviewed in the SER, the primary coolant maximum equilibrium fission product concentration was evaluated at 1.0 µCi/gm DEI. The current WBN Unit 2 TS limit for the primary coolant maximum equilibrium fission product concentration of DEI is 0.265 µCi/gm. Therefore, the analysis reviewed in the SER would be bounding for WBN Unit 2." ---------- SSER25 shows the status for this item as "Resolved."
15.4.7	25	CO --- 08	Approved for both units in SER. Unit 2 action: Use Westinghouse RFA-2 fuel as currently installed in Unit 1 for the initial cycle. ---------- ---------- REVISION 02 UPDATE: Amendment 97 to the Unit 2 FSAR was submitted on January 21, 2010. Chapter 15 was updated to address the application of RFA-2 fuel. ---------- ---------- REVISION 08 UPDATE: 15.4.7 of SSER25 includes: "NUREG-0847 does not include an NRC staff review for the radiological dose consequences of a postulated loss of ac power to the plant auxiliaries. For the completion of this SSER, the NRC staff used the CLB assumptions for Unit 1 loss of ac power as a benchmark for acceptability of the Unit 2 analysis and only addressed the following revised Unit 1 parameters and assumptions that are different for Unit 2. " and "Table 15.1 of this SSER shows TVA's calculated gamma and thyroid doses for the loss of ac power to the plant auxiliaries at the EAB and LPZ for both the realistic and conservative analyses. The doses for this accident are well within the limits of 10 CFR 100.11. Table 15.1 presents TVA's estimated whole body and thyroid dose to CR personnel from the radiation sources discussed above. Table 15.9 of this SSER includes parameters for the CR analysis. The whole body dose is below the 10 CFR Part 50, Appendix A, GDC 19 limit of 5 rem for CR personnel, and the thyroid dose is below the 30-rem acceptance criteria stated in SRP Section 6.4, 'Control Room Habitability System,' Revision 3, issued March 2007; therefore, they are acceptable." ---------- SSER25 shows the status for this item as "Resolved."

* = See last page for status code definition.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
15.4.8	25	C 08	REVISION 08 UPDATE: 15.4.7 of SSER25 includes: "There are no revised Unit 2 parameters for this accident analysis because the waste gas system is common to Units 1 and 2. Therefore, the licensing basis for the proposed Unit 2 analysis is the same as the licensing basis for Unit 1 regarding the environmental consequences of a postulated waste gas decay tank rupture. Since the NRC staff has approved the analysis for Unit 1, it is also acceptable for Unit 2. " --- SSER25 shows the status for this item as "Resolved."

STATUS CODE DEFINITIONS

C: CLOSED: Previous staff review of NUREG-0847 and/or supplements has closed the item either for both units at WBN or explicitly for WBN Unit 2.

CI: CLOSED/IMPLEMENTATION: Staff has approved either for both units at WBN or explicitly for WBN Unit 2; there is no change to the approved design; and implementation is recommended through Regional Inspection.

CO: CLOSED - OPEN: Staff has approved closure of the item; however, TVA actions remain to be completed.

CT: CLOSED/TECHNICAL SPECIFICATIONS: Item has been approved either for both units at WBN or explicitly for WBN Unit 2; however, a change to the original approval requires submittal of the Technical Specifications and staff review.

NA: NOT APPLICABLE: Justification as to why a section / subsection is not applicable is provided in the ADDITIONAL INFORMATION column.

O: OPEN: No action or documentation is provided that shows the staff has reviewed the item for WBN Unit 2.

OI: OPEN / INSPECTION: Staff has reviewed the item for WBN Unit 2; inspection is required to complete review / close the item.

OT: OPEN/TECHNICAL SPECIFICATIONS: No action or documentation is provided that shows the staff has reviewed the item for WBN Unit 2, and the resolution is through submittal of a Technical Specification.

OV: OPEN/VALIDATION: The proposed approach has been approved for Watts Bar Unit 1; the same approach is proposed for use on WBN Unit 2 without change.

S: SUBMITTED: Information has been submitted, and is under review by NRC staff.

*** = See last page for status code definition.**

Enclosure 3

Generic Communications - Master Table

GENERIC COMMUNICATIONS: MASTER TABLE

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 71-002	PWR Reactor Trip Circuit Breakers	NA	Addressed to specific plant(s).
B 71-003	Catastrophic Failure of Main Steam Line Relief Valve Headers	NA	Addressed to specific plant(s).
B 72-001	Failed Hangers for Emergency Core Cooling System Suction Header	NA	Addressed to specific plant(s).
B 72-002	Simultaneous Actuation of a Safety Injection Signal on Both Units of a Dual Unit Facility	NA	Addressed to specific plant(s).
B 72-003	Limitorque Valve Operator Failures	NA	Addressed to specific plant(s).
B 73-001	Faulty Overcurrent Trip Delay Device in Circuit Breakers for Engineered Safety Systems	C	TVA: letter dated April 4, 1973 NRC: IR 390/391 75-5
B 73-002	Malfunction of Containment Purge Supply Valve Switch	C	TVA: letter dated August 22, 1973 NRC: IR 390/391 75-5
B 73-003	Defective Hydraulic Snubbers and Restraints	C	TVA: letter dated February 7, 1985 NRC: IR 390/391 85-08
B 73-004	Defective Bergen-Patterson Hydraulic Shock Absorbers	C	TVA: memo dated February 7, 1985 NRC: IR 390/391 85-08
B 73-005	Manufacturing Defect in BWR Control Rods	NA	Boiling Water Reactor
B 73-006	Inadvertent Criticality in a BWR	NA	Boiling Water Reactor
B 74-001	Valve Deficiencies	C	TVA: letter dated April 15, 1974 NRC: IR 390/391 75-5
B 74-002	Truck Strike Possibility	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 74-003	Failure of Structural or Seismic Support Bolts on Class I Components	CI 06	TVA: memo dated January 22, 1985 NRC: IR 390/391 85-08 ---------- Approach accepted in IR 50-390/85-08 and 50-391/85-08 (March 29, 1985). Unit 2 Action: Implement per NUREG-0577 as was done for Unit 1. ---------- REVISION 06 UPDATE: Corrective action for this item consisted of a bolting reheat treatment program for both units; it has been completed.
B 74-004	Malfunction of Target Rock Safety Relief Valves	NA	Boiling Water Reactor
B 74-005	Shipment of an Improperly Shielded Source	NA	Does not apply to power reactor.
B 74-006	Defective Westinghouse Type W-2 Control Switch Component	C	TVA: letter dated October 18, 1974 NRC: IR 390/391 75-6
B 74-007	Personnel Exposure – Irradiation Facility	NA	Does not apply to power reactor.
B 74-008	Deficiency in the ITE Molded Case Circuit Breakers, Type HE-3	C	TVA: letter dated August 21, 1974 NRC: IR 390/391 75-5
B 74-009	Deficiency in GE Model 4KV Magne-Blast Circuit Breakers	C	TVA: letter dated September 20, 1974 NRC: IR 390/391 76-6
B 74-010	Failures in 4-Inch Bypass Pipe at Dresden 2	NA	Boiling Water Reactor
B 74-011	Improper Wiring of Safety Injection Logic at Zion 1 & 2	C	NRC: IR 390/391 75-6
B 74-012	Incorrect Coils in Westinghouse Type SG Relays at Trojan	C	NRC: IR 390/391 75-5
B 74-013	Improper Factory Wiring on GE Motor Control Centers at Fort Calhoun	C	TVA: letter dated December 24, 1974 NRC: IR 390/391 75-5

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 74-014	BWR Relief Valve Discharge to Suppression Pool	NA	Boiling Water Reactor
B 74-015	Misapplication of Cutler-Hammer Three Position Maintained Switch Model No. 10250T	C 06	TVA: letter dated May 5, 1975 NRC: IR 390/391 75-5 --- Unit 2 Action: Install modified A3 Cutler-Hammer 10250T switches. --- REVISION 06 UPDATE: It has been confirmed that WBN Unit 2 never had the faulty switches. --- NRC Inspection Report 391/2010-605 closed B 74-015.
B 74-016	Improper Machining of Pistons in Colt Industries (Fairbanks-Morse) Diesel-Generators	C	TVA: letter dated January 2, 1975 NRC: IR 390/391 75-3
B 75-001	Through-Wall Cracks in Core Spray Piping at Dresden-2	NA	Boiling Water Reactor
B 75-002	Defective Radionics Radiograph Exposure Devices and Source Changers	NA	Does not apply to power reactor.
B 75-003	Incorrect Lower Disc Spring and Clearance Dimension in Series 8300 and 8302 ASCO Solenoid Valves	CO 08	TVA: letter dated May 16, 1975 NRC: IR 390/391 75-6 --- NRC accepted in IR 50-390/75-6 and 50-391/75-6 (August 21, 1975). Unit 2 Action: Modify valves not modified at factory. --- REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
B 75-004	Cable Fire at BFNPP	CI	NRC: IR 390/391 85-08 Closed to Fire Protection CAP --- Part of Fire Protection CAP

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 75-005	Operability of Category I Hydraulic Shock and Sway Suppressors	CO 08	TVA: letter dated June 16, 1975 NRC: IR 390/391 75-6 --- NRC accepted in IR 50-390/75-6 and 50-391/75-6 (August 21, 1975). Unit 2 Action: Install proper suppressors. --- REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
B 75-006	Defective Westinghouse Type OT-2 Control Switches	C 07	TVA: letter dated July 31, 1975 NRC: IR 390/85-25 and 391/85-20 --- Unit 2 Action: Inspect Westinghouse Type OT-2 control switches. [WAS "NOTE 3."] --- REVISION 06 UPDATE: All Unit 2 Type OT-2 switches procured or refurbished are inspected and tested. --- REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed B 75-006.
B 75-007	Exothermic Reaction in Radwaste Shipment	NA	Does not apply to power reactor.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 75-008	PWR Pressure Instrumentation	S 02	NRC: IR 390/391 85-08 Unit 2 Action: Ensure that Technical Specifications and Site Operating Instructions address importance of maintaining temperature and pressure within prescribed limits. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. Adherence to Pressure and Temperature limits is required by the following portions of the Unit 2 TS: 1.1 [definition of "PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)"]; 3.4.3 ["RCS Pressure and Temperature (P/T) Limits"]; 3.4.12 ["Cold Overpressure Mitigation System (COMS)"]; and 5.9.6 ["Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)"].
B 76-001	BWR Isolation Condenser Tube Failure	NA	Boiling Water Reactor
B 76-002	Relay Coil Failures – GE Types HFA, HGA, HKA, HMA Relays	CI	Unit 2 Action: Repair or replace relays before preoperational tests.
B 76-003	Relay Malfunctions – GE Type STD Relays	C	TVA: letter dated May 17, 1976 NRC: IR 390/391 76-6
B 76-004	Cracks in Cold Worked Piping at BWRs	NA	Boiling Water Reactor
B 76-005	Relay Failures – Westinghouse BFD Relays	C	TVA: letter dated June 7, 1976 NRC: IR 390/391 85-08
B 76-006	Diaphragm Failures in Air Operated Auxiliary Actuators for Safety/Relief Valves	C	TVA: memo dated January 25, 1985 NRC: IR 390/391 85-08
B 76-007	Crane Hoist Control Circuit Modifications	C	TVA: letter dated October 29, 1976 NRC: IR 390/391 85-08
B 76-008	Teletherapy Units	NA	Does not apply to power reactor.
B 77-001	Pneumatic Time Delay Relay Setpoint Drift	C	TVA: letter dated July 1, 1977 NRC: IR 390/391 85-08

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 77-002	Potential Failure Mechanism in Certain Westinghouse AR Relays with Latch Attachments	C	TVA: letter dated November 11, 1977 NRC: IR 390/391 85-08
B 77-003	On-Line Testing of the Westinghouse Solid State Protection System	CI	Unit 2 Action: Include necessary periodic testing in test procedures.
B 77-004	Calculation Error Affecting The Design Performance of a System for Controlling pH of Containment Sump Water Following a LOCA	S 02	TVA: letter dated January 23, 1978 NRC: IR 390/78-11 and 391/78-09 ---------- Unit 2 Action: Ensure Technical Specifications includes limit on Boron concentration. ---------- ---------- REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS Surveillance Requirement 3.6.11.5 requires verification that the boron concentration is within a specified range.
B 77-005 and B 77-005 A	Electrical Connector Assemblies	C	TVA: letter dated January 17, 1978 NRC: IR 390/78-11 and 391/78-09
B 77-006	Potential Problems with Containment Electrical Penetration Assemblies	C	Item was applicable only to units with operating license at the time the item was issued. ---------- NRC: IR 390/391 85-08
B 77-007	Containment Electrical Penetration Assemblies at Nuclear Power Plants Under Construction	C	TVA: letter dated January 20, 1978 NRC: IR 390/78-11 and 391/78-09
B 77-008	Assurance of Safety and Safeguards During an Emergency – Locking Systems	C	Item concerns a multi-unit issue that was completed for both units. ---------- TVA: letter dated March 1, 1978 NRC: IR 390/78-11 and 391/78-09
B 78-001	Flammable Contact – Arm Retainers in GE CR120A Relays	C	TVA: letter dated March 20, 1978 NRC: IR 390/78-11 and 391/78-09
B 78-002	Terminal Block Qualification	C	TVA: letter dated March 1, 1978 NRC: IR 390/78-11 and 391/78-09

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 78-003	Potential Explosive Gas Mixture Accumulations Associated with BWR Offgas System Operations	NA	Boiling Water Reactor
B 78-004	Environmental Qualification of Certain Stem Mounted Limit Switches Inside Reactor Containment	C 08	TVA: letter dated December 19, 1978 NRC: IR 390/82-13 and 391/82-10 Closed to EQ Program ---------- IR 50-390/82-13 and 50-391/82-10 (April 22, 1982) accepted approach. Unit 2 Action: Ensure NAMCO switches have been replaced. ---------- REVISION 08 UPDATE: The NAMCO switches were replaced. NRC Inspection Report 391/2012-605 closed this item.
B 78-005	Malfunctioning of Circuit Breaker Auxiliary Contact Mechanism – GE Model CR105X	C	TVA: letter dated June 12, 1978 NRC: IR 390/78-17 and 391/78-15
B 78-006	Defective Cutler-Hammer Type M Relays With DC Coils	C	NRC: IR 390/78-22 and 391/78-19
B 78-007	Protection Afforded by Air-Line Respirators and Supplied-Air Hoods	NA	Item was applicable only to units with operating license at the time the item was issued.
B 78-008	Radiation Levels from Fuel Element Transfer Tubes	NA	Item was applicable only to units with operating license at the time the item was issued. ---------- NRC: IR 390/391 85-08
B 78-009	BWR Drywell Leakage Paths Associated with Inadequate Drywell Closures	NA	Boiling Water Reactor
B 78-010	Bergen-Patterson Hydraulic Shock Suppressor Accumulator Spring Coils	C	TVA: letter dated August 14, 1978 NRC: IR 390/78-22 and 391/78-19
B 78-011	Examination of Mark I Containment Torus Welds	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 78-012	Atypical Weld Material in Reactor Pressure Vessel Welds	C	TVA: Westinghouse letter dated October 29, 1979 NRC: IR 390/391 81-04
B 78-013	Failures in Source Heads Kay Ray, Inc. Gauges Models 7050, 7050B, 7051, 7051B, 7060, 7060B, 7061 and 7061B	NA	Does not apply to power reactor.
B 78-014	Deterioration of Buna-N Components in ASCO Solenoids	NA	Boiling Water Reactor
B 79-001	Environmental Qualification of Class 1E Equipment	C	NRC: IR 390/80-06 and 391/80-05
B 79-002	Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts	CI	NRC review of HAAUP Program in NUREG-1232, SSER6, and SSER8. Unit 2 Actions: Addressed in CAP/SP. Conduct a complete review of affected support calculations, and perform the necessary revisions to design documents and field modifications to achieve compliance.
B 79-003	Longitudinal Weld Defects in ASME SA-312 Type 304 SS Pipe Spools Manufactured by Youngstown Welding & Engineering	C	TVA: letter dated July 16, 1981 NRC: IRs 390/82-21 and 391/82-17; 390/84-35 and 391/84-33
B 79-004	Incorrect Weights for Swing Check Valves Manufactured by Velan Engineering Corporation	C	TVA: letter dated October 20, 1980 NRC: IR 390/83-15 and 391/83-11
B 79-005	Nuclear Incident at TMI	NA	Applies only to Babcock and Wilcox designed plants
B 79-006	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	C	NRC: IR 390/80-06 and 391/80-05
B 79-007	Seismic Stress Analysis of Safety-Related Piping	C	TVA: letter dated May 31, 1979 NRC: IR 390/79-30 and 391/79-25
B 79-008	Events Relevant to BWRs Identified During TMI Incident	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 79-009	Failure of GE Type AK-2 Circuit Breaker in Safety Related Systems	CI 06	TVA: letter dated June 20, 1979 ---------- Unit 2 Action: Complete preservice preventive maintenance on AK-2 Circuit Breakers. [WAS "NOTE 3."] ---------- REVISION 06 UPDATE: It has been confirmed that AK-2 Circuit Breakers are not used on Unit 2.
B 79-010	Requalification Training Program Statistics	NA	Item was applicable only to units with operating license at the time the item was issued.
B 79-011	Faulty Overcurrent Trip Device in Circuit Breakers for Engineering Safety Systems	C	TVA: letter dated July 20, 1979 NRC: IR 390/79-30 and 391/79-25
B 79-012	Short Period Scrams at BWR Facilities	NA	Boiling Water Reactor
B 79-013	Cracking in Feedwater Piping	C	Item was applicable only to units with operating license at the time the item was issued. ---------- TVA: letter dated December 1, 1983 NRC: IR 390/391 85-08
B 79-014	Seismic Analysis for As-Built Safety-Related Piping Systems	CI	NRC review of HAAUP Program in NUREG-1232, SSER6, and SSER8. Unit 2 Actions: * Addressed in CAP/SP. * Initiate a Unit 2 hanger walkdown and hanger analysis program similar to the program for Unit 1. * Complete re-analysis of piping and associated supports as necessary. * Perform modifications as required by re-analysis.
B 79-015	Deep Draft Pump Deficiencies	C	TVA: letter dated January 24, 1992 NRC: IR 390/391 95-70

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 79-016	Vital Area Access Controls	NA	Item was applicable only to units with operating license at the time the item was issued. --- NRC: IR 390/80-06 and 391/80-05
B 79-017	Pipe Cracks in Stagnant Borated Water Systems at PWR Plants	NA	Item was applicable only to units with operating license at the time the item was issued. NRC: IR 390/80-06 and 391/80-05; NUREG/ CR 5286
B 79-018	Audibility Problems Encountered on Evacuation of Personnel from High-Noise Areas	NA	Item was applicable only to units with operating license at the time the item was issued. --- NRC: IR 390/80-06 and 391/80-05
B 79-019	Packaging of Low-Level Radioactive Waste for Transport and Burial	NA	Item was applicable only to units with operating license at the time the item was issued. --- NRC: IR 390/80-06 and 391/80-05
B 79-020	Packaging, Transport and Burial of Low-Level Radioactive Waste	NA	Item was applicable only to units with operating license at the time the item was issued. --- NRC: IR 390/80-06 and 391/80-05
B 79-021	Temperature Effects on Level Measurements	C 06	Reviewed in 7.2.5 of both the original 1982 SER and SSER14. Unit 2 Action: Update accident calculation. --- CONFIRMATORY ISSUE - address IEB 79-21 to alleviate temperature dependence problem associated with measuring SG water level In SSER14, NRC concurred with TVA's assessment to not insulate the steam generator water level instrument reference leg. Unit 2 Action: Update accident calculation. --- --- REVISION 06 UPDATE: The calculations were updated. --- NRC Inspection Report 391/2010-605 closed B 79-021.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 79-022	Possible Leakage of Tubes of Tritium Gas Used in Time Pieces for Luminosity	NA	Does not apply to power reactor. ---------- NRC: IR 390/80-06 and 391/80-05
B 79-023	Potential Failure of Emergency Diesel Generator Field Exciter Transformer	C	TVA: letter dated October 29, 1979 NRC: IR 390/80-06 and 391/80-05
B 79-024	Frozen Lines	CI	Unit 2 Actions: * Insulate the section of piping in the containment spray full-flow test line that is exposed to outside air. * Confirm installation of heat tracing on the sensing lines off the feedwater flow elements.
B 79-025	Failures of Westinghouse BFD Relays in Safety-Related Systems	C	TVA: letter dated January 4, 1980 NRC: IR 390/80-03 and 391/80-02
B 79-026	Boron Loss from BWR Control Blades	NA	Boiling Water Reactor
B 79-027	Loss of Non-Class 1E I & C Power System Bus During Operation	CI	TVA responded to the Bulletin on March 1, 1982. Reviewed in 7.5.3 of the original 1982 SER. Unit 2 Action: Issue appropriate emergency procedures.
B 79-028	Possible Malfunction of NAMCO Model EA180 Limit Switches at Elevated Temperatures	C	TVA: letter dated April 1, 1993 NRC: IR 390/391 93-32
B 80-001	Operability of ADS Valve Pneumatic Supply	NA	Boiling Water Reactor
B 80-002	Inadequate QA for Nuclear Supplied Equipment	NA	Boiling Water Reactor
B 80-003	Loss of Charcoal from Standard Type II, 2 Inch, Tray Adsorber Cells	C	TVA: letter dated March 21, 1980 NRC: IR 390/80-15 and 391/80-12

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 80-004	Analysis of a PWR Main Steam Line Break with Continued Feedwater Addition	CI 06	IR 50-390/85-60 and 50-391/85-49 (December 6, 1985) required completion of actions that included determination of temperature profiles inside and outside of containment following a MSLB for Unit 1. Unit 2 Action: Complete analysis for Unit 2. REVISION 06 UPDATE: The analysis for Unit 2 was completed.
B 80-005	Vacuum Condition Resulting in Damage to Chemical Volume Control System Holdup Tanks	CI	Closed in IR 50-390/84-59 and 50-391/84-45. Unit 2 Action: Complete surveillance procedures for Unit 2.
B 80-006	Engineered Safety Feature Reset Control	CI	TVA response dated March 11, 1982. Reviewed in 7.3.5 of the original 1982 SER. Unit 2 Action: Perform verification during the preoperational testing.
B 80-007	BWR Jet Pump Assembly Failure	NA	Boiling Water Reactor
B 80-008	Examination of Containment Liner Penetration Welds	C	TVA: letter dated July 8, 1980 NRC: IR 390/391 81-19
B 80-009	Hydramotor Actuator Deficiencies	C	TVA: letter dated January 15, 1981 NRC: NUREG/ CR 5291; IR 390/391 85-08; IR 390/85-60 and 391/85-49
B 80-010	Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment	CI 06	Unit 2 Actions: 2) Include proper monitoring of non-radioactive systems in procedures. REVISION 06 UPDATE: Chemistry procedure CM-3.01 (System Chemistry Specification) includes a radiation monitoring system for non-radioactive systems and provides appropriate surveillance limits. Additionally, it provides required actions if the surveillance limits are not met.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 80-010	Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment	CI 06	Unit 2 Actions: 1) Correct deficiencies involving monitoring of systems. --- --- REVISION 06 UPDATE: Chemistry procedure CM-3.01 (System Chemistry Specification) includes a radiation monitoring system for non-radioactive systems and provides appropriate surveillance limits. Additionally, it provides required actions if the surveillance limits are not met.
B 80-011	Masonry Wall Design	CI 08	NRC accepted all but completion of corrective actions in IR 50-390/93-01 and 50-391/93-01(February 25, 1993) and closed for Unit 1 in IR 50-390/95-46 (August 1, 1995). Unit 2 Action: Complete implementation for Unit 2. --- --- REVISION 08 UPDATE: NRC Inspection Report 391/2011-610 closed this item.
B 80-012	Decay Heat Removal System Operability	CI	NRC: IR 390/391 85-08; NUREG/CR 4005 --- Unit 2 Action: Implement operating instructions and abnormal operating instructions (AOIs) for RHR. [WAS "NOTE 3."]
B 80-013	Cracking in Core Spray Spargers	NA	Boiling Water Reactor
B 80-014	Degradation of Scram Discharge Volume Capability	NA	Boiling Water Reactor
B 80-015	Possible Loss of Emergency Notification System with Loss of Offsite Power	C	Item concerns a multi-unit issue that was completed for both units. --- NRC: IR 390/391 85-08
B 80-016	Potential Misapplication of Rosemount, Inc. Models 1151 and 1152 Pressure Transmitters With Either "A" or "D" Output Codes	C	TVA: letter dated August 29, 1980 NRC: IR 390/391 81-17
B 80-017	Failure of 76 of 185 Control Rods to Fully Insert During a Scram at a BWR	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 80-018	Maintenance of Adequate Minimum Flow Thru Centrifugal Charging Pumps Following Secondary Side High Energy Rupture	CO 06	IR 50-390/85-60 and 50-391/85-49 (Unit 1) Unit 2 Action: Implement design and procedure changes. REVISION 06 UPDATE: NRC Inspection Report 391/2011-604 closed B 80-018.
B 80-019	Mercury-Wetted Matrix Relay in Reactor Protective Systems of Operating Nuclear Power Plants Designed by CE	C	TVA: letter dated September 4, 1980 NRC: NUREG/CR 4933; IR 390/391 81-17
B 80-020	Failure of Westinghouse Type W-2 Spring Return to Neutral Control Switches	C 08	Unit 2 Action: Modify switches. REVISION 06 UPDATE: The switches were modified. NRC Inspection Report 391/2011-604 closed B 80-020. REVISION 08 UPDATE: Changed status from "CI" to "C."
B 80-021	Valve Yokes Supplied by Malcolm Foundry Co., Inc.	C	TVA: letter dated May 6, 1981 NRC: 390/391 85-08
B 80-022	Automation Industries, Model 200-520-008 Sealed-Source Connectors	NA	Does not apply to power reactor.
B 80-023	Failures of Solenoid Valves Manufactured by Valcor Engineering Corporation	C	TVA: letter dated March 31, 1981 NRC: IR 390/391 81-17; NUREG/CR 5292

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 80-024	Prevention of Damage Due to Water Leakage Inside Containment (10/17/80 Indian Point 2 Event)	CI 06	Unit 2 Action: Confirm that the reactor cavity can not be flooded, resulting in the partial or total submergence of the reactor vessel unnoticed by the reactor operators. REVISION 06 UPDATE: It was confirmed that the reactor cavity can not be flooded, resulting in the partial or total submergence of the reactor vessel unnoticed by the reactor operators.
B 80-025	Operating Problems with Target Rock Safety-Relief Valves at BWRs	NA	Boiling Water Reactor
B 81-001	Surveillance of Mechanical Snubbers	NA	NRC: IR 390/391 81-17
B 81-002	Failure of Gate Type Valves to Close Against Differential Pressure	C	TVA: letter dated September 30, 1983 NRC: IR 390/391 84-03
B 81-003	Flow Blockage of Cooling Water to Safety System Components by Asiatic Clams and Mussels	C	TVA: letters dated July 21, 1981 and March 21, 1983 NRC: IR 390/391 81-17
B 82-001	Alteration of Radiographs of Welds in Piping Subassemblies	C	NRC: IR 390/391 85-08
B 82-002	Degradation of Threaded Fasteners in the Reactor Coolant Pressure Boundary of PWR Plants	CI 06	TVA: memo dated February 6, 1985 NRC: IR 390/391 85-08 Approach accepted in IR 50-390/85-08 and 50-391/85-08 (March 29, 1985). Unit 2 Action: Implement same approach as Unit 1. REVISION 06 UPDATE: The boric acid corrosion program applies to both units.
B 82-003	Stress Corrosion Cracking in Thick-Wall, Large Diameter, Stainless Steel, Recirculation System Piping at BWR Plants	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 82-004	Deficiencies in Primary Containment Electrical Penetration Assemblies	C	TVA: letter dated January 24, 1983 NRC: IR 390/83-10 and 391/83-08
B 83-001	Failure of Trip Breakers (Westinghouse DB-50) to Open on Automatic Trip Signal	C	NRC: IRs 390/391 85-08 and 390/391 92-13
B 83-002	Stress Corrosion Cracking in Large-Diameter Stainless Steel Recirculation System Piping at BWR Plants	NA	Boiling Water Reactor
B 83-003	Check Valve Failures in Raw Water Cooling Systems of Diesel Generators	NA	Addressed by Inservice Testing for Construction Permit holders
B 83-004	Failure of the Undervoltage Trip Function of Reactor Trip Breakers	C 06	NRC: IR 390/391 85-08 Unit 2 Action: Install new undervoltage attachment with wider grooves on the reactor trip breakers. REVISION 06 UPDATE: New breakers have been installed on Unit 2. NRC Inspection Report 391/2011-602 closed B 83-004.
B 83-005	ASME Nuclear Code Pumps and Spare Parts Manufactured by the Hayward Tyler Pump Company	C	TVA: letter dated September 7, 1983 NRC: IR 390/85-03 and 391/85-04; NUREG/CR 5297
B 83-006	Nonconforming Material Supplied by Tube-Line Facilities	C 08	TVA: letter dated February 2, 1984 NRC: IR 390/391 84-03; NUREG/CR 4934 NRC SER for both units dated September 23, 1991, provided an alternate acceptance for fittings supplied by Tube-Line. Unit 2 Action: Implement as necessary. REVISION 04 UPDATE: NRC Inspection Report Nos. 50-390/90-02 and 50-391/90-02 found the

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			proposed alternative to ASME code paragraph NA-3451 (a) to be acceptable. It noted that TVA must revise the FSAR to document this deviation from ASME Section III requirements. TVA letter to NRC dated October 11, 2007, stated the Unit 1 exemption is applicable to Unit 2 and was submitted to the NRC as being required for Unit 2 construction. Final action was to incorporate the exemption in the Unit 2 FSAR. This exemption is documented in Unit 2 FSAR Section 3.2 in paragraph 3.2.3.2 and Table 3.2-2a as explained in Note 4. of the table. --- --- REVISION 08 UPDATE: NRC Inspection Report 391/2012-603 closed this item.
B 83-007	Apparently Fraudulent Products Sold by Ray Miller, Inc.	C	TVA: letter dated March 22, 1984 NRC: IR 390/85-03 and 391/85-04
B 83-008	Electrical Circuit Breakers With an Undervoltage Trip Feature in Safety-Related Applications Other Than the Reactor Trip System	C	TVA: letter dated March 29, 1984 NRC: IR 390/84-35 and 391/84-33
B 84-001	Cracks in BWR Mark 1 Containment Vent Headers	NA	Boiling Water Reactor
B 84-002	Failure of GE Type HFA Relays In Use In Class 1E Safety Systems	C	TVA: letter dated July 10, 1984 NRC: IR 390/391 84-42 and IR 390/84-77 and 391/84-54
B 84-003	Refueling Cavity Water Seal	CI	Reviewed in IR 390/93-11. Unit 2 Action: Ensure appropriate abnormal operating instructions (AOIs) are used for Unit 2.
B 85-001	Steam Binding of Auxiliary Feedwater Pumps	CI	TVA: letter dated January 27, 1986 NRC: IR 390/391 90-20 --- NRC accepted approach in letter dated July 20, 1988, and reviewed response in Appendix EE of SSER16. Unit 2 Action: Procedures and hardware will be in place to ensure recognition of indications of steam binding and maintenance of system operability until check valves are repaired and back leakage stopped.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 85-002	Undervoltage Trip Attachment of Westinghouse DB-50 Type Reactor Trip Breakers	C 06	Unit 2 Action: Install automatic shunt trip on the Westinghouse DS-416 reactor trip breakers on Unit 2. REVISION 06 UPDATE: New breakers (including an automatic shunt trip) have been installed on Unit 2. NRC Inspection Report 391/2011-602 closed B 85-002.
B 85-003	Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings	C	Superseded by GL 89-10
B 86-001	Minimum Flow Logic Problems That Could Disable RHR Pumps	NA	Boiling Water Reactor
B 86-002	Static "O" Ring Differential Pressure Switches	C	TVA: letter dated November 20, 1986 NRC: IR 390/391/90-24
B 86-003	Potential Failure of Multiple ECCS Pumps Due to Single Failure of Air-Operated Valve in Minimum Flow Recirculation Line	C	TVA: letter dated November 14, 1986 NRC: IR 390/391/87-03
B 86-004	Defective Teletherapy Timer That May Not Terminate Treatment Dose	NA	Does not apply to power reactor.
B 87-001	Thinning of Pipe Walls in Nuclear Power Plants	C	TVA: letter dated September 18, 1987 NRC: NUREG/CR 5287 Closed to GL 89-08

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 87-002	Fastener Testing to Determine Conformance with Applicable Material Specifications	CI 03	TVA: letters dated April 15, 1988, July 6, 1988, September 12, 1988, and January 27, 1989 NRC: letter dated August 18, 1989 ---------- NRC closed in letter dated August 18, 1989. Unit 2 Action: Complete for Unit 2, using information used for Unit 1, as applicable. ---------- ---------- REVISION 03 UPDATE: Unit 2 has completed fastener testing as required by this Bulletin.
B 88-001	Defects in Westinghouse Circuit Breakers	C	TVA: letter dated November 15, 1991 NRC: IR 390/391 93-01
B 88-002	Rapidly Propagating Fatigue Cracks in Steam Generator Tubes	CI 07	NRC acceptance letter dated June 7, 1990, for both units. Unit 2 Actions: * Evaluate E/C data to determine anti-vibration bar penetration depth; * perform T/H analysis to identify susceptible tubes; * modify, if necessary. ---------- ---------- REVISION 07 UPDATE: The following actions have been completed: * E/C data was evaluated to determine anti-vibration bar penetration depth; * T/H analysis was completed identifying susceptible tubes; * modifications, as necessary, were completed.
B 88-003	Inadequate Latch Engagement in HFA Type Latching Relays Manufactured by General Electric (GE) Company	C	TVA: letter dated April 13, 1992 NRC: IR 390/391 92-13

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 88-004	Potential Safety-Related Pump Loss	CI 08	NRC acceptance letter dated May 24, 1990, for both units. Unit 2 Actions: * Perform calculations, and * install check valves to prevent pump to pump interaction. REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
B 88-005	Nonconforming Materials Supplied by Piping Supplies, Inc. and West Jersey Manufacturing Company	CI	NRC reviewed in Appendix EE of SSER16. Unit 2 Actions: * Complete review to locate installed WJM material, and * perform in-situ hardness testing for Unit 2.
B 88-006	Actions to be Taken for the Transfer of Model No. SPEC 2-T Radiographic Exposure Device	NA	Does not apply to power reactor.
B 88-007	Power Oscillations in BWRs	NA	Boiling Water Reactor
B 88-008	Thermal Stresses in Piping Connected to Reactor Cooling Systems	CI 08	NRC acceptance letter dated September 19, 1991 (both units). NRC acceptance letter dated June 26, 1995 (Unit 1). Unit 2 Action: * Implement program to prevent thermal stratification. * Submit a letter to NRC that confirms actions are complete for WBN Unit 2 within 30 days of completion of the modifications.
B 88-009	Thimble Tube Thinning in Westinghouse Reactors	CI 06	Reviewed in Appendix EE of SSER16. Unit 2 Action: TVA letter dated March 11, 1994, for both units committed to establish a program and inspect the thimble tubes during the first refueling outage. REVISION 06 UPDATE: Unit 2 is installing the Westinghouse In-core, Information, Surveillance, and Engineering (WINCISE) system. Westinghouse has analyzed WINCISE to exhibit essentially no wear due to vibrations, and should there be a breach of the thimble tube there would not be a loss of into the seal table room, Therefore, the thimble tubes for WINCISE do not need eddy current testing.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 88-010	Nonconforming Molded-Case Circuit Breakers	C 08	Unit 2 Action: Replace those circuits not traceable to a circuit breaker manufacturer. REVISION 07 UPDATE: All Unit 2 safety-related molded case circuit breakers were replaced with new qualified breakers procured from the original equipment manufacturers. REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
B 88-011	Pressurizer Surge Line Thermal Stratification	CI	NRC SER on "Leak-Before-Break" (April 28, 1993) and reviewed in Appendix EE of SSER16. Unit 2 Actions: * Complete modifications to accommodate Surge Line thermal movements, and * incorporate a temperature limitation during heatup and cooldown operations into Unit 2 procedures.
B 89-001	Failure of Westinghouse Steam Generator Tube Mechanical Plugs	C 06	NRC acceptance letter dated September 26, 1991 for both units. Unit 2 Action: Remove SG tube plugs. REVISION 06 UPDATE: The SG tube plugs were removed. NRC Inspection Report 391/2011-602 closed B 89-001.
B 89-002	Stress Corrosion Cracking of High-Hardness Type 410 Stainless Steel Internal Preloaded Bolting in Anchor Darling Model S350W Swing Check Valves or Valves of Similar Nature	CI 06	NRC reviewed in Appendix EE of SSER16. Unit 2 Actions: * Replace the flapper assembly hold-down bolts fabricated on the 14 (12 valves are installed) Atwood and Morrell Mark No. 47W450-53 check valves. * Replacement bolts are to be fabricated from ASTM F593 Alloy 630. * A review of the remaining Unit 2 safety related swing check valves will be performed.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			--- --- REVISION 06 UPDATE: * Bolts fabricated from ASTM F593 Alloy 630 have been procured. * The review of the remaining Unit 2 safety related swing check valves was completed. Needed corrective actions were initiated.
B 89-003	Potential Loss of Required Shutdown Margin During Refueling Operations	CI 07	TVA: letter dated June 19, 1990 NRC: IR 390/391 94-04 and letter dated June 22, 1990 --- NRC acceptance letter dated June 22, 1990. Unit 2 Action: Ensure that requirements for fuel assembly configuration, fuel loading and training are included in Unit 2. --- --- REVISION 07 UPDATE: Requirements for fuel assembly configuration, fuel loading and training are included in Unit 2.
B 90-001	Loss of Fill-Oil in Transmitters Manufactured by Rosemount	CO 06	Unit 2 Action: Implement applicable recommendations from this Bulletin including identification of potentially defective transmitters and an enhanced surveillance program which monitors transmitters for loss of fill oil. --- --- REVISION 06 UPDATE: NRC Inspection Report 391/2011-603 closed B 90-001.
B 90-002	Loss of Thermal Margin Caused by Channel Box Bow	NA	Boiling Water Reactor
B 91-001	Reporting Loss of Criticality Safety Controls	NA	Does not apply to power reactor.
B 92-001	Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free From Fire Damage	NA 02	--- --- REVISION 02 UPDATE: This bulletin was provided for information only to plants with construction permits. See Generic Letter 92-08 for Thermo-lag related actions.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 92-002	Safety Concerns Related to "End of Life" of Aging Theratronics Teletherapy Units	NA	Does not apply to power reactor.
B 92-003	Release of Patients After Brachytherapy	NA	Does not apply to power reactor.
B 93-001	Release of Patients After Brachytherapy Treatment with Remote Afterloading Devices	NA	Does not apply to power reactor.
B 93-002	Debris Plugging of Emergency Core Cooling Suction Strainers	C 02	Boiling Water Reactor REVISION 02 UPDATE: In Rev. 01, this was characterized as "NA - BWR only". This Bulletin was provided for Information to holders of construction permits. No WBN response was found. B-93-02 was closed in IR 50-390/94-04 and 50-391/94-04.
B 93-003	Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs	NA	Boiling Water Reactor
B 94-001	Potential Fuel Pool Draindown Caused by Inadequate Maintenance Practices at Dresden Unit 1	NA	Addressed to holders of licenses for nuclear power reactors that are permanently shut down with spent fuel in the spent fuel pool
B 94-002	Corrosion Problems in Certain Stainless Steel Packagings Used to Transport Uranium Hexafluoride	NA	Does not apply to power reactor.
B 95-001	Quality Assurance Program for Transportation of Radioactive Material	NA	Does not apply to power reactor.
B 95-002	Unexpected Clogging of a Residual Heat Removal Pump Strainer While Operating in Suppression Pool Cooling Mode	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 96-001, first part	Control Rod Insertion Problems (PWR)	CI 04	NRC acceptance letter for Unit 1 dated July 22, 1996 – Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Issue Emergency Operating Procedure. REVISION 02 UPDATE: Unit 2 will load all new RFA-2 fuel for the initial fuel load. REVISION 03 UPDATE: NRC issued the Safety Evaluation (corrected) for Bulletin 1996-001 on May 3, 2010. REVISION 04 UPDATE: Corrected status from "OV" to "CI" due to NRC issuance of Safety Evaluation as noted in Revision 03 update.
B 96-001, last part	Control Rod Insertion Problems (PWR)	CI 06	NRC acceptance letter for Unit 1 dated July 22, 1996 – Initial response for Unit 2 on September 7, 2007. Unit 2 Action: and provide core map. REVISION 03 UPDATE: NRC issued the Safety Evaluation (corrected) for Bulletin 1996-001 on May 3, 2010. REVISION 04 UPDATE: Corrected status from "OV" to "CI" due to NRC issuance of Safety Evaluation as noted in Revision 03 update. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC letter dated May 3, 2010 (ADAMS Accession No. ML101200035) required Confirmatory Action (See Appendix HH)" The applicable item from SER22, Appendix HH for this item is Open

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			Item 5, "Verify timely submittal of pre-startup core map and perform technical review. (TVA letter dated September 7, 2007, ADAMS Accession No. ML072570676)." TVA to NRC letter dated April 6, 2011 provided the following response to Open Item 5: "Attachment 1 provides the requested core map."
B 96-002	Movement of Heavy Loads over Spent Fuel, Over Fuel in the Reactor, or Over Safety-Related Equipment	CI 06	NRC closure letter dated May 20, 1998. Unit 2 Action: Unit 2 Heavy Loads Program will be in compliance with NUREG-0612. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Bulletin 1996-002 on March 4, 2010. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC letter dated March 4, 2010 (ADAMS Accession No. ML100480062)"
B 96-003	Potential Plugging of ECCS Suction Strainers by Debris in BWRs	NA	Boiling Water Reactor
B 96-004	Chemical, Galvanic, or Other Reactions in Spent Fuel Storage and Transportation Casks	NA	Info
B 97-001	Potential for Erroneous Calibration, Dose Rate, or Radiation Exposure Measurements with Certain Victoreen Model 530 and 531SI Electrometer/Dosemeters	NA	Does not apply to power reactor.
B 97-002	Puncture Testing of Shipping Packages Under 10 CFR Part 71	NA	Does not apply to power reactor.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 01-001	Circumferential Cracking of Reactor Pressure Vessel (RPV) Head Penetration Nozzles	C 06	NRC acceptance letter dated November 20, 2001 (Unit 1) – Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Perform baseline inspection. --- --- REVISION 02 UPDATE: Unit 2 Actions: * Perform baseline inspection. * Evaluate or repair as necessary. --- --- REVISION 03 UPDATE: NRC issued the Safety Evaluation for Bulletin 2001-001 on June 30, 2010. --- --- REVISION 04 UPDATE: Corrected status from "OV" to "CI" due to NRC issuance of Safety Evaluation as noted in Revision 03 update. --- --- REVISION 06 UPDATE: The baseline inspection was performed with evaluations and repairs as necessary. --- SSER22 contained the following for NRC Action: "Closed. See NRC Letter dated June 30, 2010 (ADAMS Accession No. ML 100539515)" --- NRC Inspection Report 391/2011-602 closed B 01-001.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 02-001	RPV Head Degradation and Reactor Coolant Pressure Boundary Integrity	C 06	NRC review of Unit 1's 15 day response in letter dated May 20, 2002 – Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Perform baseline inspection. --- --- REVISION 02 UPDATE: Unit 2 Actions: * Perform baseline inspection. * Evaluate or repair as necessary. --- --- REVISION 03 UPDATE: NRC issued the Safety Evaluation for Bulletin 2002-001 on June 30, 2010. --- --- REVISION 04 UPDATE: Corrected status from "OV" to "CI" due to NRC issuance of Safety Evaluation as noted in Revision 03 update. --- --- REVISION 06 UPDATE: The baseline inspection was performed with evaluations and repairs as necessary. --- SSSER22 contained the following for NRC Action: "Closed. See NRC Letter dated June 30, 2010 (ADAMS Accession No. ML 100539515)" --- NRC Inspection Report 391/2011-602 closed B 02-001.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 02-002	RPV Head and Vessel Head Penetration Nozzle Inspection Programs	C 06	NRC acceptance letter dated December 20, 2002 (Unit 1) – Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Perform baseline inspection. --- --- REVISION 02 UPDATE: Unit 2 Actions: * Perform baseline inspection. * Evaluate or repair as necessary. --- --- REVISION 03 UPDATE: NRC issued the Safety Evaluation for Bulletin 2002-002 on June 30, 2010. --- --- REVISION 04 UPDATE: Corrected status from "OV" to "CI" due to NRC issuance of Safety Evaluation as noted in Revision 03 update. --- --- REVISION 06 UPDATE: The baseline inspection was performed with evaluations and repairs as necessary. --- SSSER22 contained the following for NRC Action: "Closed. See NRC Letter dated June 30, 2010 (ADAMS Accession No. ML 100539515)" --- NRC Inspection Report 391/2011-602 closed B 02-002.
B 03-001	Potential Impact of Debris Blockage on Emergency Sump Recirculation at PWRs	NA	TVA: letter dated September 7, 2007

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 03-002	Leakage from RPV Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity (PWRs)	CI 06	NRC acceptance letter dated October 6, 2004 (Unit 1) – Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Perform baseline inspection. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Bulletin 2003-002 on January 21, 2010. Unit 2 Actions: * Perform baseline inspection. * Evaluate or repair as necessary. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061)"
B 03-003	Potentially Deficient 1-inch Valves for Uranium Hexaflouride Cylinders	NA	Does not apply to power reactor.
B 03-004	Rebaselining of Data in the Nuclear Management and Safeguards System	C	TVA: letter dated December 18, 2003 Item concerns a multi-unit issue that was completed for both units.
B 04-001	Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at PWRs	CO 07	Initial response for Unit 2 on September 7, 2007. Unit 2 Actions: * Provide details of pressurizer and penetrations, and * apply Material Stress Improvement Process. REVISION 02 UPDATE: TVA provided details of the pressurizer and penetrations on September 29, 2008. This letter committed to: Prior to placing the pressurizer in service, TVA will apply the Material Stress Improvement Process (MSIP) to the Pressurizer Power Operated Relief Valve connections, the safety relief valve connections, the spray line nozzle and surge line nozzle connections.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			TVA will perform a bare metal visual (BMV) inspection of the upper pressurizer Alloy 600 locations at the first refueling outage. REVISION 03 UPDATE: April 1, 2010, letter committed to: TVA will perform NDE prior to and after performance of the MSIP. If circumferential cracking is observed in either pressure boundary or non-pressure boundary portions of any locations covered under the scope of the bulletin, TVA will develop plans to perform an adequate extent-of-condition evaluation, and TVA will discuss those plans with cognizant NRC technical staff prior to starting Unit 2. After performing the BMV inspection during the first refueling outage, if any evidence of apparent reactor coolant pressure boundary leakage is discovered, then NDE capable of determining crack orientation will be performed in order to accurately characterize the flaw, the orientation, and extent. TVA will develop plans to perform an adequate extent of condition evaluation, and plans to possibly expand the scope of NDE to other components in the pressurizer will be discussed with NRC technical staff prior to restarting of Unit 2. REVISION 04 UPDATE: NRC issued the Safety Evaluation for Bulletin 2004-001 on August 4, 2010. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated August 4, 2010 (ADAMS Accession No. ML102080017)" REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed
B 05-001	Material Control and Accounting at Reactors and Wet Spent Fuel Storage Facilities	C	TVA: letters dated March 21, 2005 and May 11, 2005 Item concerns a multi-unit issue that was completed for both units.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 05-002	Emergency Preparedness and Response Actions for Security-Based Events	C	TVA: letters dated January 20, 2006 and August 16, 2006. ---------- Item concerns a multi-unit issue that was completed for both units.
B 07-001	Security Officer Attentiveness	C 06	Item concerns a multi-unit issue that was completed for both units. ---------- REVISION 05 UPDATE: The NRC closed this bulletin via letter dated March 25, 2010 (ADAMS Accession No. ML100770549). ---------- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated March 25, 2010 (ADAMS Accession No. ML 100770549)"
C 76-001	Crane Hoist Control Circuit Modifications	C	See B 76-007 for additional information.
C 76-002	Relay Failures - Westinghouse BF (AC) and BFD (DC) Relays	C	TVA: letter dated November 22, 1976 informed NRC that these relay types are not used in Class 1E circuits. NRC: IR 50/390/76-11 and 50/391/76-11
C 76-003	Radiation Exposures in Reactor Cavities	NA	Info
C 76-004	Neutron Monitor and Flow Bypass Switch Malfunctions	NA	Boiling Water Reactor
C 76-005	Hydraulic Shock And Sway Suppressors - Maintenance of Bleed and Lock-Up Velocities on ITT Grinnell's Model Nos. - Fig. 200 And Fig. 201, Catalog Ph-74-R	C	TVA: letter dated January 7, 1977 informed NRC that no Grinnell shock suppressors or sway braces have been or will be installed at WBN.
C 76-006	Stress Corrosion Cracks in Stagnant, Low Pressure Stainless Piping Containing Boric Acid Solution at PWRs	NA	Item was applicable only to units with operating license at the time the item was issued.
C 76-007	Inadequate Performance by Reactor Operating and Support Staff Members	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 77-001	Malfunctions of Limitorque Valve Operators	NA	Info
C 77-002a	Potential Heavy Spring Flooding (CP)	NA	Item was applicable only to units with operating license at the time the item was issued.
C 77-003	Fire Inside a Motor Control Center	NA	Info
C 77-004	Inadequate Lock Assemblies	NA	Info
C 77-005	Fluid Entrapment in Valve Bonnets	NA	Info
C 77-006	Effects of Hydraulic Fluid on Electrical Cables	NA	Info
C 77-007	Short Period During Reactor Startup	NA	Boiling Water Reactor
C 77-008	Failure of Feedwater Sample Probe	NA	Item was applicable only to units with operating license at the time the item was issued.
C 77-009	Improper Fuse Coordination in BWR Standby Liquid Control System Control Circuits	NA	Boiling Water Reactor
C 77-010	Vacuum Conditions Resulting in Damage to Liquid Process Tanks	NA	Item was applicable only to units with operating license at the time the item was issued.
C 77-011	Leakage of Containment Isolation Valves with Resilient Seats	NA	Info
C 77-012	Dropped Fuel Assemblies at BWR Facilities	NA	Boiling Water Reactor
C 77-013	Reactor Safety Signals Negated During Testing	NA	Info
C 77-014	Separation of Contaminated Water Systems from Noncontaminated Plant Systems	NA	Info
C 77-015	Degradation of Fuel Oil Flow to the Emergency Diesel Generator	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 77-016	Emergency Diesel Generator Electrical Trip Lock-Out Features	NA	Info
C 78-001	Loss of Well Logging Source	NA	Does not apply to power reactor.
C 78-002	Proper Lubricating Oil for Terry Turbines	NA	Info
C 78-003	Packaging Greater Than Type A Quantities of Low Specific Activity Radioactive Material for Transport	NA	Info
C 78-004	Installation Errors That Could Prevent Closing of Fire Doors	NA	Info
C 78-005	Inadvertent Safety Injection During Cooldown	NA	Info
C 78-006	Potential Common Mode Flooding of ECCS Equipment Rooms at BWR Facilities	NA	Info
C 78-007	Damaged Components of a Bergen-Paterson Series 25000 Hydraulic Test Stand	NA	Info
C 78-008	Environmental Qualification of Safety-Related Electrical Equipment at Nuclear Power Plants	NA	Info
C 78-009	Arcing of General Electric Company Size 2 Contactors	NA	Info
C 78-010	Control of Sealed Sources in Radiation Therapy	NA	Does not apply to power reactor.
C 78-011	Recirculation MG Set Overspeed Stops	NA	Boiling Water Reactor
C 78-012	HPCI Turbine Control Valve Lift Rod Bending	NA	Boiling Water Reactor
C 78-013	Inoperability of Service Water Pumps	NA	Info
C 78-014	HPCI Turbine Reversing Chamber Hold Down Bolting	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 78-015	Tilting Disc Check Valves Fail to Close with Gravity in Vertical Position	NA	Info
C 78-016	Limitorque Valve Actuators	NA	Info
C 78-017	Inadequate Guard Training/Qualification and Falsified Training Records	NA	Info
C 78-018	UL Fire Test	NA	Info
C 78-019	Manual Override (Bypass) of Safety System Actuation Signals	NA	Info
C 79-001	Administration of Unauthorized Byproduct Material to Humans	NA	Does not apply to power reactor.
C 79-002	Failure of 120 Volt Vital AC Power Supplies	NA	Info
C 79-003	Inadequate Guard Training - Qualification and Falsified Training Records	NA	Info
C 79-004	Loose Locking Nut on Limitorque Valve Operators	NA	Info
C 79-005	Moisture Leakage in Stranded Wire Conductors	NA	Info
C 79-006	Failure to Use Syringe and Bottle Shields in Nuclear Medicine	NA	Does not apply to power reactor.
C 79-007	Unexpected Speed Increase of Reactor Recirculation MG Set Resulted in Reactor Power Increase	NA	Boiling Water Reactor
C 79-008	Attempted Extortion - Low Enriched Uranium	NA	Fuel facilities and operating reactors at the time the item was issued
C 79-009	Occurrences of Split or Punctured Regulator Diaphragms in Certain Self Contained Breathing Apparatus	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 79-010	Pipefittings Manufactured from Unacceptable Material	NA	Info
C 79-011	Design/Construction Interface Problem	NA	Info
C 79-012	Potential Diesel Generator Turbocharger Problem	NA	Info
C 79-013	Replacement of Diesel Fire Pump Starting Contactors	NA	Info
C 79-014	Unauthorized Procurement and Distribution of XE-133	NA	Does not apply to power reactor.
C 79-015	Bursting of High Pressure Hose and Malfunction of Relief Valve O-Ring in Certain Self-Contained Breathing Apparatus	NA	Item was applicable only to units with operating license at the time the item was issued.
C 79-016	Excessive Radiation Exposures to Members of the General Public and a Radiographer	NA	Does not apply to power reactor.
C 79-017	Contact Problem in SB-12 Switches on General Electric Company Metalclad Circuit Breakers	NA	Info
C 79-018	Proper Installation of Target Rock Safety-Relief Valves	NA	Boiling Water Reactor
C 79-019	Loose Locking Devices on Ingersoll-Rand Pumps	NA	Info
C 79-020	Failure of GTE Sylvania Relay Type PM Bulletin 7305 Catalog 5U12-11-AC with a 120V AC Coil	NA	Info
C 79-021	Prevention of Unplanned Releases of Radioactivity	NA	Info
C 79-022	Stroke Times for Power Operated Relief Valves	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 79-023	Motor Starters and Contactors Failed to Operate	C 01	The Circular did not require a response. TVA reported a nonconformance under 10 CFR 50.55e on January 17, 1980, that four motor starters of this type had been located in the 480V control and auxiliary vent boards at WBN. Gould factory representatives supervised the replacement of the carrier assemblies in accordance with the Gould instructions. The starters with replaced carriers were acceptable. NRC IR 50-390/80-03 and 50-391/80-02 reviewed and closed the associated nonconformance reports.
C 79-024	Proper Installation and Calibration of Core Spray Pipe Break Detection Equipment on BWRs	NA	Boiling Water Reactor
C 79-025	Shock Arrestor Strut Assembly Interference	C 01	The Circular did not require a response. TVA reported a nonconformance under 10 CFR 50.55e on March 6, 1980, that a review had determined that nine installed supports had brackets with the potential of hindering full function of the support. Additional supports that were not installed had the same potential problem. TVA initially determined that the supports would be modified in accordance with a vendor approved drawing. TVA subsequently determined that no actual problem existed and no field work was required. NRC IR 50-390/83-15 and 50-391/83-11 reviewed and closed the associated nonconformance reports.
C 80-001	Service Advice for GE Induction Disc Relays	NA	Info
C 80-002	Nuclear Power Plant Staff Work Hours	NA	Info
C 80-003	Protection from Toxic Gas Hazards	NA	Info
C 80-004	Securing of Threaded Locking Devices on Safety-Related Equipment	NA	Info
C 80-005	Emergency Diesel-Generator Lubricating Oil Addition and Onsite Supply	NA	Info
C 80-006	Control and Accountability Systems for Implant Therapy Sources	NA	Does not apply to power reactor.
C 80-007	Problems with HPCI Turbine Oil System	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 80-008	BWR Technical Specification Inconsistency - RPS Response Time	NA	Boiling Water Reactor
C 80-009	Problems with Plant Internal Communications Systems	NA	Info
C 80-010	Failure to Maintain Environmental Qualification of Equipment	NA	Info
C 80-011	Emergency Diesel Generator Lube Oil Cooler Failures	NA	Info
C 80-012	Valve-Shaft-to-Actuator Key May Fall Out of Place when Mounted Below Horizontal Axis	NA	Info
C 80-013	Grid Strap Damage in Westinghouse Fuel Assemblies	NA	Info
C 80-014	Radioactive Contamination of Plant Demineralized Water System and Resultant Internal Contamination of Personnel	NA	Info
C 80-015	Loss of Reactor Coolant Pump Cooling and Natural Circulation Cooldown	NA	Info
C 80-016	Operational Deficiencies in Rosemount Model 510DU Trip Units and Model 1152 Pressure Transmitters	NA	Info
C 80-017	Fuel Pin Damage Due to Water Jet from Baffle Plate Corner	NA	Info
C 80-018	10 CFR 50.59 Safety Evaluations for Changes to Radioactive Waste Treatment Systems	NA	Info
C 80-019	Noncompliance with License Requirements for Medical Licensees	NA	Does not apply to power reactor.
C 80-020	Changes in Safe-Slab Tank Dimensions	NA	Info
C 80-021	Regulation of Refueling Crews	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 80-022	Confirmation of Employee Qualifications	NA	Info
C 80-023	Potential Defects in Beloit Power Systems Emergency Generators	NA	Info
C 80-024	AECL Teletherapy Unit Malfunction	NA	Does not apply to power reactor.
C 80-025	Case Histories of Radiography Events	NA	Does not apply to power reactor.
C 81-001	Design Problems Involving Indicating Pushbutton Switches Manufactured by Honeywell Incorporated	NA	Info
C 81-002	Performance of NRC-Licensed Individuals while on Duty	NA	Item was applicable only to units with operating license at the time the item was issued.
C 81-003	Inoperable Seismic Monitoring Instrumentation	NA	Info
C 81-004	The Role of Shift Technical Advisors and Importance of Reporting Operational Events	NA	Info
C 81-005	Self-Aligning Rod End Bushings for Pipe Supports	NA	Info
C 81-006	Potential Deficiency Affecting Certain Foxboro 10 to 50 Milliampere Transmitters	NA	Info
C 81-007	Control of Radioactively Contaminated Material	NA	Info
C 81-008	Foundation Materials	NA	Info
C 81-009	Containment Effluent Water that Bypasses Radioactivity Monitor	NA	Info
C 81-010	Steam Voiding in the Reactor Coolant System During Decay Heat Removal Cooldown	NA	Item was applicable only to units with operating license at the time the item was issued.
C 81-011	Inadequate Decay Heat Removal During Reactor Shutdown	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
C 81-012	Inadequate Periodic Test Procedure of PWR Reactor Protection System	NA	Info
C 81-013	Torque Switch Electrical Bypass Circuit for Safeguard Service Valve Motors	C 01	The Circular did not require a response. TVA reported a nonconformance under 10 CFR 50.55e on April 4, 1986 (NCR W367-P), that required closing torque switches were found improperly wired. This issue (Torque switch and overload relay bypass capability for active safety related valves) is part of the Electrical Issues Corrective Action Program for WBN Unit 2.
C 81-014	Main Steam Isolation Valve Failures to Close	NA	Info
C 81-015	Unnecessary Radiation Exposures to the Public and Workers During Events Involving Thickness and Level Measuring Devices	NA	Info
GL 77-001	Intrusion Detection Systems Handbook	NA	Info
GL 77-002	Fire Protection Functional Responsibilities	NA	Info
GL 77-003	Transmittal of NUREG-0321, "A Study of the Nuclear Regulatory Commission Quality Assurance Program"	NA	Info
GL 77-004	Shipments of Contaminated Components From NRC Licensed Power Facilities to Vendors & Service Companies	NA	Info
GL 77-005	Nonconformity of Addressees of Items Directed to the Office of Nuclear Reactor Regulation	NA	Info
GL 77-006	Enclosing Questionnaire Related to Steam Generators	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 77-007	Reliability of Standby Diesel Generator Units	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 77-008	Revised Intrusion Detection Handbook and Entry Control Systems Handbook	NA	Info
GL 78-001	Correction to Letter of 12/15/77 [GL 77-07]	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 78-002	Asymmetric Loads Background and Revised Request for Additional Information	C	NRC: Reviewed in SSER15 – Appendix C (June 1995). Resolved by approval of leak-before-break analysis.
GL 78-003	Request For Information on Cavity Annulus Seal Ring	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 78-004	GAO Blanket Clearance for Letter Dated 12/09/77 [GL 77-06]	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 78-005	Internal Distribution of Correspondence – Asking for Comments on Mass Mailing System	NA	Info
GL 78-006	This GL was never issued.	NA	
GL 78-007	This GL was never issued.	NA	
GL 78-008	Enclosing NUREG-0408 Re Mark I Containments, and Granting Exemption from GDC 50 and Enclosing Sample Notice	NA	Boiling Water Reactor
GL 78-009	Multiple-Subsequent Actuations of Safety/Relief Valves Following an Isolation Event	NA	Boiling Water Reactor
GL 78-010	Guidance on Radiological Environmental Monitoring	NA	Info
GL 78-011	Guidance on Spent Fuel Pool Modifications	NA	Info
GL 78-012	Notice of Meeting Regarding "Implementation of 10 CFR 73.55 Requirements and Status of Research ..."	NA	Info
GL 78-013	Forwarding of NUREG-0219	NA	Info
GL 78-014	Transmittal of Draft NUREG-0219 for Comment	NA	Info
GL 78-015	Request for Information on Control of Heavy Loads Near Spent Fuel	NA	See GL 81-007.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 78-016	Request for Information on Control of Heavy Loads Near Spent Fuel Pools	NA	Info
GL 78-017	Corrected Letter on Heavy Loads Over Spent Fuel	NA	Info
GL 78-018	Corrected Letter on Heavy Loads Over Spent Fuel	NA	Duplicate of GL 81-007
GL 78-019	Enclosing Sandia Report SAND 77-0777, "Barrier Technology Handbook"	NA	Info
GL 78-020	Enclosing – "A Systematic Approach to the Conceptual Design of Physical Protection Systems for Nuclear Facilities	NA	Info
GL 78-021	Transmitting NUREG/CR-0181, "Concerning Barrier and Penetration Data Needed for Physical Security System Assessment"	NA	Info
GL 78-022	Revision to Intrusion Detection Systems and Entry Control Systems Handbooks and Nuclear Safeguards Technology Handbook	NA	Info
GL 78-023	Manpower Requirements for Operating Reactors	NA	Info
GL 78-024	Model Appendix I Technical Specifications and Submittal Schedule For BWRs	NA	Boiling Water Reactor
GL 78-025	This GL was never issued.	NA	
GL 78-026	Excessive Control Rod Guide Tube Wear	NA	Applies only to Babcock and Wilcox designed plants
GL 78-027	Forwarding of NUREG-0181	NA	Info
GL 78-028	Forwarding pages omitted from 07/11/78 letter [GL 78-24]	NA	Boiling Water Reactor
GL 78-029	Notice of PWR Steam Generator Conference	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 78-030	Forwarding of NUREG-0219	NA	Info
GL 78-031	Notice of Steam Generator Conference Agenda	NA	Info
GL 78-032	Reactor Protection System Power Supplies	NA	Boiling Water Reactor
GL 78-033	Meeting Schedule and Locations For Upgraded Guard Qualification	NA	Info
GL 78-034	Reactor Vessel Atypical Weld Material	C	See B 78-12.
GL 78-035	Regional Meetings to Discuss Upgraded Guard Qualifications	NA	Info
GL 78-036	Cessation of Plutonium Shipments by Air Except In NRC Approved Containers	NA	Does not apply to power reactor.
GL 78-037	Revised Meeting Schedule & Locations For Upgraded Guard Qualifications	NA	Info
GL 78-038	Forwarding of 2 Tables of Appendix I, Draft Radiological Effluent Technical Specifications, PWR, and NUREG-0133	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 78-039	Forwarding of 2 Tables of Appendix I, Draft Radiological Effluent Technical Specifications, BWR, and NUREG-0133	NA	Boiling Water Reactor
GL 78-040	Training & Qualification Program Workshops	NA	Info
GL 78-041	Mark II Generic Acceptance Criteria For Lead Plants	NA	Boiling Water Reactor
GL 78-042	Training and Qualification Program Workshops	NA	Info
GL 79-001	Interservice Procedures for Instructional Systems Development - TRADOC	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 79-002	Transmitting Rev. to Entry Control Systems Handbook (SAND 77-1033), Intrusion Detection Handbook (SAND 76-0554), and Barrier Penetration Database	NA	Info
GL 79-003	Offsite Dose Calculation Manual	NA	Info
GL 79-004	Referencing 4/14/78 Letter - Modifications to NRC Guidance "Review and Acceptance of Spent Fuel Pool Storage and Handling"	NA	Info
GL 79-005	Information Relating to Categorization of Recent Regulatory Guides by the Regulatory Requirements Review Committee	NA	Info
GL 79-006	Contents of the Offsite Dose Calculation Manual	NA	Info
GL 79-007	Seismic (SSE) and LOCA Responses (NUREG-0484)	NA	Info
GL 79-008	Amendment to 10 CFR 73.55	NA	Info
GL 79-009	Staff Evaluation of Interim Multiple-Consecutive Safety-Relief Valve Actuations	NA	Boiling Water Reactor
GL 79-010	Transmitting Regulatory Guide 2.6 for Comment	NA	Does not apply to power reactor.
GL 79-011	Transmitting "Summary of Operating Experience with Recalculating Steam Generators, January 1979," NUREG-0523	NA	Info
GL 79-012	ATWS - Enclosing Letter to GE, with NUREG-0460, Vol. 3	NA	Info
GL 79-013	Schedule for Implementation and Resolution of Mark I Containment Long Term Program	NA	Info
GL 79-014	Pipe Crack Study Group - Enclosing NUREG-0531 and Notice	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 79-015	Steam Generators - Enclosing Summary of Operating Experience with Recirculating Steam Generators, NUREG-0523	NA	Info
GL 79-016	Meeting Re Implementation of Physical Security Requirements	NA	Info
GL 79-017	Reliability of Onsite Diesel Generators at Light Water Reactors	NA	Info
GL 79-018	Westinghouse Two-Loop NSSS	NA	Addressed to specific plant(s).
GL 79-019	NRC Staff Review of Responses to Bs 79-06 and 79-06a	NA	Addressed to specific plant(s).
GL 79-020	Cracking in Feedwater Lines	C	See B 79-13.
GL 79-021	Enclosing NUREG/CR-0660, Enhancement of on Site Emergency Diesel Generator Reliability"	NA	Info
GL 79-022	Enclosing NUREG-0560, "Staff Report on the Generic Assessment of Feedwater Transients in PWRs Designed by B&W"	NA	Applies only to Babcock and Wilcox designed plants
GL 79-023	NRC Staff Review of Responses to B 79-08	NA	Boiling Water Reactor
GL 79-024	Multiple Equipment Failures in Safety-Related Systems	NA 01	GL 79-24 provided a discussion of an inadvertent reactor scram and safety injection during monthly surveillance tests of the safeguards system at a PWR facility. The GL requested a review to determine if similar errors had or could have occurred at other PWRs. The GL further requested a review of management policies and procedures to assure that multiple equipment failures in safety-related systems will be vigorously pursued and analyzed to identify significant reduction in the ability of safety systems to function as required. A response was requested within 30 days of receipt of the GL with the results of these reviews. TVA does not have a record of receiving or responding to this GL. Thus, TVA concluded that this item was applicable only to PWRs with an operating license at the time the GL was issued.
GL 79-025	Information Required to Review Corporate Capabilities	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 79-026	Upgraded Standard Technical Specification Bases Program	NA	Info
GL 79-027	Operability Testing of Relief and Safety Relief Valves	NA	Boiling Water Reactor
GL 79-028	Evaluation of Semi-Scale Small Break Experiment	NA	Info
GL 79-029	Transmitting NUREG-0473, Revision 2, Draft Radiological Effluent Technical Specifications	NA	Info
GL 79-030	Transmitting NUREG-0472, Revision 2, Draft Radiological Technical Specifications	NA	Info
GL 79-031	Submittal of Copies of Response to 6/29/79 NRC Request [79-25]	NA	Info
GL 79-032	Transmitting NUREG-0578, "TMI-2 Lessons Learned"	NA	Info
GL 79-033	Transmitting NUREG-0576, "Security Training and Qualification Plans"	NA	Info
GL 79-034	New Physical Security Plans (FR 43280-285)	NA	Does not apply to power reactor.
GL 79-035	Regional Meetings to Discuss Impacts on Emergency Planning	NA	Info
GL 79-036	Adequacy of Station Electric Distribution Systems Voltages	CI	This GL tracked compliance with BTP PSB-1, "Adequacy of Station Electric Distribution System Voltages." Unit 2 Action: Perform verification during the preoperational testing.
GL 79-037	Amendment to 10 CFR 73.55 Deferral from 8/1/79 to 11/1/79	NA	Info
GL 79-038	BWR Off-Gas Systems - Enclosing NUREG/CR-0727	NA	Boiling Water Reactor
GL 79-039	Transmitting Division 5 Draft Regulatory Guide and Value Impact Statement	NA	Does not apply to power reactor.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 79-040	Follow-up Actions Resulting from the NRC Staff Reviews Regarding the TMI-2 Accident	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 79-041	Compliance with 40 CFR 190, EPA Uranium Fuel Cycle Standard	NA	Info
GL 79-042	Potentially Unreviewed Safety Question on Interaction Between Non-Safety Grade Systems and Safety Grade Systems	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 79-043	Reactor Cavity Seal Ring Generic Issue	NA	Addressed to specific plant(s).
GL 79-044	Referencing 6/29/79 Letter Re Multiple Equipment Failures	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 79-045	Transmittal of Reports Regarding Foreign Reactor Operating Experiences	NA	Info
GL 79-046	Containment Purge and Venting During Normal Operation – Guidelines for Valve Operability	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 79-047	Radiation Training	NA	Info
GL 79-048	Confirmatory Requirements Relating to Condensation Oscillation Loads for the Mark I Containment Long Term Program	NA	Boiling Water Reactor
GL 79-049	Summary of Meetings Held on 9/18-20/79 to Discuss Potential Unreviewed Safety Question on Systems Interaction for B&W PI	NA	Info
GL 79-050	Emergency Plans Submittal Dates	NA	Info
GL 79-051	Follow-up Actions Resulting from the NRC Staff Reviews Regarding the TMI-2 Accident	NA 01	GL 79-51 provided follow-up actions resulting from the Three Mile Island Unit 2 accident. GL 79-51 was provided for planning and guidance purposes. Its principal element was a report titled "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations" (NUREG-0573). This GL and the NUREG were superseded by GL 80-90 and NUREG-0737. See GL 80-90 for further information.
GL 79-052	Radioactive Release at North Anna Unit 1 and Lessons Learned	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 79-053	ATWS	NA	Info
GL 79-054	Containment Purging and Venting During Normal Operation	NA	Addressed to specific plant(s).
GL 79-055	Summary of Meeting Held on October 12, 1979 to Discuss Responses to Bulletins 79-05C and 79-06C and HPI Termination Criteria	NA	Info
GL 79-056	Discussion of Lessons Learned Short Term Requirements	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 79-057	Acceptance Criteria for Mark I Long Term Program	NA	Boiling Water Reactor
GL 79-058	ECCS Calculations on Fuel Cladding	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 79-059	This GL was never issued.	NA	
GL 79-060	Discussion of Lessons Learned Short Term Requirements	NA	Info
GL 79-061	Discussion of Lessons Learned Short Term Requirements	NA	Info
GL 79-062	ECCS Calculations on Fuel Cladding	NA	Item was applicable only to units with operating license at the time the item was issued. Duplicate of GL 79-058
GL 79-063	Upgraded Emergency Plans	C 01	GL 79-63 advised applicants for licenses of proposed rulemaking that NRC concurrence in State and local emergency plans would be a condition for issuing an operating license. TVA responded to GL 79-63 on January 3, 1980, and confirmed the intent to revise the Emergency Plan to address the NRC requirements.
GL 79-064	Suspension of All Operating Licenses (PWRs)	NA	Info
GL 79-065	Radiological Environmental Monitoring Program Requirements - Enclosing Branch Technical Position, Revision 1	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 79-066	Additional Information Re 11/09/79 Letter on ECCS Calculations [GL 79-62]	NA	Info
GL 79-067	Estimates for Evacuation of Various Areas Around Nuclear Power Reactors	NA	Info
GL 79-068	Audit of Small Break LOCA Guidelines	NA	Info
GL 79-069	Cladding Rupture, Swelling, and Coolant Blockage as a Result of a Reactor Accident	NA	Info
GL 79-070	Environmental Monitoring for Direct Radiation	NA	Info
GL 80-001	NUREG-0630, "Cladding, Swelling and Rupture - Models For LOCA Analysis"	NA	Info
GL 80-002	QA Requirements Regarding Diesel Generator Fuel Oil	C	TVA: FSAR 9.5.4.2
GL 80-003	BWR Control Rod Failures	NA	Boiling Water Reactor
GL 80-004	B 80-01, "Operability of ADS Valve Pneumatic Supply"	NA	Boiling Water Reactor
GL 80-005	B 79-01b, "Environmental Qualification of Class 1E Equipment"	NA	Info
GL 80-006	Issuance of NUREG-0313, Rev 1, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping"	NA	Boiling Water Reactor
GL 80-007	This GL was never issued.	NA	
GL 80-008	B 80-02. "Inadequate Quality Assurance for Nuclear Supplied Equipment"	NA	Boiling Water Reactor
GL 80-009	Low Level Radioactive Waste Disposal	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-010	Issuance of NUREG-0588, "Interim Staff Position On Equipment Qualifications of Safety-Related Electrical Equipment"	NA	Info
GL 80-011	B 80-03, "Loss of Charcoal From Standard Type II, 2 Inch, Tray Absorber Cells"	C 01	GL 80-11 transmitted Bulletin 80-03. TVA responded to B 80-03 on March 21, 1980. See B 80-03 for further information.
GL 80-012	B 80-04, "Analysis of a PWR Main Steam Line Break With Continued Feedwater Addition"	NA	Info
GL 80-013	Qualification of Safety Related Electrical Equipment	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-014	LWR Primary Coolant System Pressure Isolation Valves	S 02	TVA: FSAR 5.2.7.4 NRC: 1.14.2 of SSER 6 ---------- NRC reviewed in 1.14.2 of SSER6. Unit 2 Action: Incorporate guidance into Technical Specifications. ---------- REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS Surveillance Requirement 3.4.13.1 verifies RCS operational leakage by performance of an RCS water inventory balance.
GL 80-015	Request for Additional Management and Technical Resources Information	NA	Info
GL 80-016	B 79-01b, "Environmental Qualification of Class 1E Equipment"	NA	Info
GL 80-017	Modifications to BWR Control Rod Drive Systems	NA	Boiling Water Reactor
GL 80-018	Crystal River 3 Reactor Trip From Approximately 100% Full Power	NA	Applies only to Babcock and Wilcox designed plants
GL 80-019	Resolution of Enhanced Fission Gas Release Concern	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-020	Actions Required From OL Applicants of NSSS Designs by W and CE Resulting From NRC B&O Task Force Review of TMI2 Accident	NA	Info
GL 80-021	B 80-05, "Vacuum Condition Resulting in Damage to Chemical Volume Control System Holdup Tanks"	CI	Closed in IR 50-390/84-59 and 50-391/84-45. Unit 2 Action: Complete surveillance procedures for Unit 2.
GL 80-022	Transmittal of NUREG-0654, "Criteria For Preparation and Evaluation of Radiological Emergency Response Plan"	NA	Info
GL 80-023	Change of Submittal Date For Evaluation Time Estimates	NA	Info
GL 80-024	Transmittal of Information on NRC "Nuclear Data Link Specifications"	NA	Info
GL 80-025	B 80-06, "Engineering Safety Feature (ESF) Reset Controls"	NA	Info
GL 80-026	Qualifications of Reactor Operators	NA	Info
GL 80-027	B 80-07, "BWR Jet Pump Assembly Failure"	NA	Boiling Water Reactor
GL 80-028	B 80-08, "Examination of Containment Liner Penetration Welds"	C 01	GL 80-28 transmitted Bulletin 80-08. TVA responded to B 80-08 on July 8, 1980. See B 80-08 for further information.
GL 80-029	Modifications to Boiling Water Reactor Control Rod Drive Systems	NA	Boiling Water Reactor
GL 80-030	Clarification of The Term "Operable" As It Applies to Single Failure Criterion For Safety Systems Required by TS	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-031	B 80-09, "Hydramotor Actuator Deficiencies"	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-032	Information Request on Category I Masonry Walls Employed by Plants Under CP and OL Review	C 01	GL 80-32 transmitted NRC questions on masonry walls. TVA provided the information requested by letters dated February 12, 1981, for reinforced walls and August 20, 1981, for nonreinforced walls. TVA provided a final response on January 22, 1982. See B 80-11 for further information.
GL 80-033	Actions Required From OL Applicants of B&W Designed NSSS Resulting From NRC B&O Task Force Review of TMI2 Accident	NA	Applies only to Babcock and Wilcox designed plants
GL 80-034	Clarification of NRC Requirements for Emergency Response Facilities at Each Site	NA	Info
GL 80-035	Effect of a DC Power Supply Failure on ECCS Performances	NA	Boiling Water Reactor
GL 80-036	B 80-10, "Contamination of Non-Radioactive System and Resulting Potential For Unmonitored, Uncontrolled Release to Environment"	NA	Info
GL 80-037	Five Additional TMI-2 Related Requirements to Operating Reactors	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-038	Summary of Certain Non-Power Reactor Physical Protection Requirements	NA	Does not apply to power reactor.
GL 80-039	B 80-11, "Masonry Wall Design"	NA	Info
GL 80-040	Transmittal of NUREG-0654, "Report of the B&O Task Force" and Appropriate NUREG-0626, "Generic Evaluation of FW Transient and Small Break LOCA"	NA	Info
GL 80-041	Summary of Meetings Held on April 22 &23, 1980 With Representatives of the Mark I Owners Group	NA	Info
GL 80-042	B 80-12, "Decay Heat Removal System Operability"	NA	Info
GL 80-043	B 80-13, "Cracking In Core Spray Spargers"	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-044	Reorganization of Functions and Assignments Within ONRR/SSPB	NA	Info
GL 80-045	Fire Protection Rule	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-046 and GL 80-047	Generic Technical Activity A-12, "Fracture Toughness and Additional Guidance on Potential for Low Fracture toughness and Laminar Tearing on PWR Steam Generator Coolant Pump Supports"	C	No response was required for this GL, and NUREG-0577 states that the lamellar tearing aspect of this issue was resolved by the NUREG. Further, the NUREG states that for plants under review, the fracture toughness issue was resolved.
GL 80-048	Revision to 5/19/80 Letter On Fire Protection [GL 80-45]	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-049	Nuclear Safeguards Problems	NA	Info
GL 80-050	Generic Activity A-10, "BWR Cracks"	NA	Boiling Water Reactor
GL 80-051	On-Site Storage of Low-Level Waste	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-052	Five Additional TMI-2 Related Requirements - Erata Sheets to 5/7/80 Letter [GL 80-37]	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-053	Decay Heat Removal Capability	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-054	B 80-14, "Degradation of Scram Discharge Volume Capability"	NA	Boiling Water Reactor
GL 80-055	B 80-15, "Possible Loss of Hotline With Loss of off-Site Power"	NA	Info
GL 80-056	Commission Memorandum and Order on Equipment Qualification	NA	Info
GL 80-057	Further Commission Guidance For Power Reactor Operating Licenses NUREG-0660 and NUREG-0694	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-058	B 80-16, "Potential Misapplication of Rosemount Inc. Models 1151/1152 Pressure Transmitters With "A" Or "D" Output Codes"	NA	Info
GL 80-059	Transmittal of Federal Register Notice RE Regional Meetings to Discuss Environmental Qualification of Electrical Equipment	NA	Info
GL 80-060	Request for Information Regarding Evacuation Times	NA	Info
GL 80-061	TMI-2 Lessons Learned	NA	Info
GL 80-062	TMI-2 Lessons Learned	NA	Boiling Water Reactor
GL 80-063	B 80-17, "Failure of Control Rods to Insert During a Scram at a BWR"	NA	Boiling Water Reactor
GL 80-064	Scram Discharge Volume Designs	NA	Boiling Water Reactor
GL 80-065	Request for Estimated Construction Completion and Fuel Load Schedules	NA	Info
GL 80-066	B 80-17, Supplement 1, "Failure of Control Rods to Insert During a Scram at a BWR"	NA	Boiling Water Reactor
GL 80-067	Scram Discharge Volume	NA	Boiling Water Reactor
GL 80-068	B 80-17, Supplement 2, "Failures Revealed by Testing Subsequent to Failure of Control Rods to Insert During a Scram at a BWR"	NA	Boiling Water Reactor
GL 80-069	B 80-18, "Maintenance of Adequate Minimum Flow Through Centrifugal Charging Pumps Following Secondary Side HELB"	NA	Info
GL 80-070	B 80-19, "Failures of Mercury-Wetted Matrix Relays in RPS of Operating Nuclear Power Plants Designed by GE"	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-071	B 80-20, "Failures of Westinghouse Type W-2 Spring Return to Neutral Control Switches"	NA	Info
GL 80-072	Interim Criteria For Shift Staffing	NA	Info
GL 80-073	"Functional Criteria For Emergency Response Facilities," NUREG-0696	NA	Info
GL 80-074	Notice of Forthcoming Meeting With Representatives of EPRI to Discuss Program For Resolution of USI A-12, "Fracture Toughness Issue"	NA	Info
GL 80-075	Lessons Learned Tech. Specs.	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-076	Notice of Forthcoming Meeting With GE to Discussed Proposed BWR Feedwater Nozzle Leakage Detection System	NA	Info
GL 80-077	Refueling Water Level – Technical Specifications Changes	S 02	Unit 2 Action: Address in Technical Specifications, as appropriate. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS LCO 3.9.7 requires the refueling cavity water level to be maintained greater than or equal to 23 feet above the top of the reactor vessel flange during movement of irradiated fuel assemblies within containment.
GL 80-078	Mark I Containment Long-Term Program	NA	Boiling Water Reactor
GL 80-079	B 80-17, Supplement 3, "Failures Revealed by Testing Subsequent to Failure of Control Rods to Insert During a Scram At a BWR"	NA	Boiling Water Reactor
GL 80-080	Preliminary Clarification of TMI Action Plan Requirements	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-081	Preliminary Clarification of TMI Action Plan Requirements - Addendum to 9/5/80 Letter [GL 80-80]	NA	Info
GL 80-082	B 79-01b, Supplement 2, "Environmental Qualification of Class 1E Equipment"	NA	Info
GL 80-083	Environmental Qualification of Safety-Related Equipment	NA	Info
GL 80-084	BWR Scram System	NA	Boiling Water Reactor
GL 80-085	Implementation of Guidance From USI A-12, "Potential For LOW Fracture Toughness and Lamellar Tearing On Component Support"	NA	Info
GL 80-086	Notice of Meeting to Discuss Final Resolution of USI A-12	NA	Info
GL 80-087	Notice of Meeting to Discuss Status of EPRI-Proposed Resolution of the USI A-12 Fracture Toughness Issue	NA	Info
GL 80-088	Seismic Qualification of Auxiliary Feedwater Systems	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-089	B 79-01b, Supplement 3, "Environmental Qualification of Class 1E Equipment"	NA	Info
GL 80-090	NUREG-0737, TMI (Prior and future GLs, with the exception of certain discrete scopes, have been screened into NUREG list for those applicable to Watts Bar 2)	CI	See NUREG items in this list.
GL 80-091	ODYN Code Calculation	NA	Boiling Water Reactor
GL 80-092	B 80-21, "Valve Yokes Supplied by Malcolm Foundry Company, Inc."	C 01	GL 80-92 transmitted Bulletin 80-21. TVA responded to B 80-21 on May 6, 1981. See B 80-21 for further information.
GL 80-093	Emergency Preparedness	NA	Does not apply to power reactor.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-094	Emergency Plan	NA	Info
GL 80-095	Generic Technical Activity A-10, NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking"	NA	Boiling Water Reactor
GL 80-096	Fire Protection	NA	Addressed to specific plant(s).
GL 80-097	B 80-23, "Failures of Solenoid Valves Manufactured by Valcor Engineering Corporation"	NA	Info
GL 80-098	B 80-24, "Prevention of Damage Due to Water Leakage Inside Containment"	NA	Info
GL 80-099	Technical Specifications Revisions For Snubber Surveillance	NA	Info
GL 80-100	Appendix R to 10 CFR 50 Regarding Fire Protection - Federal Register Notice	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-101	Inservice Inspection Programs	NA	Addressed to specific plant(s).
GL 80-102	Commission Memorandum and Order of May 23, 1980 (Referencing B 79-01b, Supplement 2 - q.2 & 3 - Sept 30, 1980)	NA	Info
GL 80-103	Fire Protection - Revised Federal Register Notice	NA	Info
GL 80-104	Orders On Environmental Qualification of Safety Related Electrical Equipment	NA	Info
GL 80-105	Implementation of Guidance For USI A-12, "Potential For Low Fracture toughness and Lamellar Tearing On Component Supports"	NA	Info
GL 80-106	Report On ECCS Cladding Models, NUREG-0630	NA	Info
GL 80-107	BWR Scram Discharge System	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 80-108	Emergency Planning	NA	Info
GL 80-109	Guidelines For SEP Soil Structure Interaction Reviews	NA	Info
GL 80-110	Periodic Updating of FSARS	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 80-111	B 80-17, Supplement 4, "Failure of Control Rods to Insert During a Scram at a BWR"	NA	Boiling Water Reactor
GL 80-112	B 80-25, "Operating Problems With Target Rock Safety Relief Valves"	NA	Info
GL 80-113	Control of Heavy Loads	C	Superseded by GL 81-007.
GL 81-001	Qualification of Inspection, Examination, Testing and Audit Personnel	NA	Info
GL 81-002	Analysis, Conclusions and Recommendations Concerning Operator Licensing	NA	Info
GL 81-003	Implementation of NUREG-0313, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping"	NA	Boiling Water Reactor
GL 81-004	Emergency Procedures and Training for Station Blackout Events	C	Superseded by Station Blackout Rule.
GL 81-005	Information Regarding The Program For Environmental Qualification of Safety-Related Electrical Equipment	NA	Info
GL 81-006	Periodic Updating of Final Safety Analysis Reports (FSARS)	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 81-007	Control of Heavy Loads	CI	"Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor, or Over Safety-Related Equipment" – NRC closure letter dated May 20, 1998. LICENSE CONDITION: Control of heavy loads (NUREG-0612) The staff concluded in SSER13 that the license condition was no longer necessary based on their review of TVA's response to NUREG-0612 guidelines for Phase I in TVA letter dated July 28, 1993. Unit 2 Action: Unit 2 Heavy Loads Program will be in compliance with NUREG-0612.
GL 81-008	ODYN Code	NA	Boiling Water Reactor
GL 81-009	BWR Scram Discharge System	NA	Boiling Water Reactor
GL 81-010	Post-TMI Requirements For The Emergency Operations Facility	NA	Info
GL 81-011	BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking (NUREG-0619)	NA	Boiling Water Reactor
GL 81-012	Fire Protection Rule	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 81-013	SER For GEXL Correlation For 8X8R Fuel Reload Applications For Appendix D Submittals of The GE topical Report	NA	Boiling Water Reactor
GL 81-014	Seismic Qualification of Auxiliary Feedwater Systems	CI	TVA: FSAR 10.4.9 ---------- Unit 2 Action: Additional Unit 2 implementing procedures or other activity is required for completion. [WAS "OL."]
GL 81-015	Environmental Qualification of Class 1E Electrical Equipment - Clarification of Staff's Handling of Proprietary Information	NA	Info
GL 81-016	NUREG-0737, Item I.C.1 SER on Abnormal Transient Operating Guidelines (ATOG)	NA	Applies only to Babcock and Wilcox designed plants
GL 81-017	Functional Criteria for Emergency Response Facilities	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 81-018	BWR Scram Discharge System - Clarification of Diverse Instrumentation Requirements	NA	Boiling Water Reactor
GL 81-019	Thermal Shock to Reactor Pressure Vessels	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 81-020	Safety Concerns Associated With Pipe Breaks in the BWR Scram System	NA	Boiling Water Reactor
GL 81-021	Natural Circulation Cooldown	CI	TVA responded December 3, 1981. Unit 2 Action: Issue operating procedures.
GL 81-022	Engineering Evaluation of the H. B. Robinson Reactor Coolant System Leak on 1/29/81	NA	Info
GL 81-023	INPO Plant Specific Evaluation Reports	NA	Info
GL 81-024	Multi-Plant Issue B-56, "Control Rods Fail to Fully Insert"	NA	Boiling Water Reactor
GL 81-025	Change in Implementing Schedule For Submission and Evaluation of Upgraded Emergency Plans	NA	Info
GL 81-026	Licensing Requirements for Pending Construction Permit and Manufacturing License Applications	NA	Applicants with pending Construction Permits
GL 81-027	Privacy and Proprietary Material in Emergency Plans	NA	Info
GL 81-028	Steam Generator Overfill	NA	Info
GL 81-029	Simulator Examinations	NA	Info
GL 81-030	Safety Concerns Associated With Pipe Breaks in the BWR Scram System	NA	Boiling Water Reactor
GL 81-031	This GL was never issued.	NA	

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 81-032	NUREG-0737, Item II.K.3.44, "Evaluation of Anticipated Transients Combined With Single Failure"	NA	Boiling Water Reactor
GL 81-033	This GL was never issued.	NA	
GL 81-034	Safety Concerns Associated With Pipe Breaks in the BWR Scram System	NA	Boiling Water Reactor
GL 81-035	Safety Concerns Associated With Pipe Breaks in the BWR Scram System	NA	Boiling Water Reactor
GL 81-036	Revised Schedule for Completion of TMI Action Plan Item II.D.1, "Relief and Safety Valve Testing"	NA	Info
GL 81-037	ODYN Code Reanalysis Requirements	NA	Boiling Water Reactor
GL 81-038	Storage of Low Level Radioactive Wastes at Power Reactor Sites	NA	Info
GL 81-039	NRC Volume Reduction Policy	NA	Info
GL 81-040	Qualifications of Reactor Operators	NA	Info
GL 82-001	New Applications Survey	NA	Info
GL 82-002	Commission Policy on Overtime	NA	Info
GL 82-003	High Burnup MAPLHGR Limits	NA	Boiling Water Reactor
GL 82-004	Use of INPO See-in Program	NA	Info
GL 82-005	Post-TMI Requirements	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 82-006	This GL was never issued.	NA	

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 82-007	Transmittal of NUREG-0909 Relative to the Ginna Tube Rupture	NA	Boiling Water Reactor
GL 82-008	Transmittal of NUREG-0909 Relative to the Ginna Tube Rupture	NA	Info
GL 82-009	Environmental Qualification of Safety Related Electrical Equipment	NA	Info
GL 82-010	Post-TMI Requirements	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 82-011	Transmittal of NUREG-0916 Relative to the Restart of R. E. Ginna Nuclear Power Plant	NA	Info
GL 82-012	Nuclear Power Plant Staff Working Hours	NA	Info
GL 82-013	Reactor Operator and Senior Reactor Operator Examinations	NA	Info
GL 82-014	Submittal of Documents to the NRC	NA	Info
GL 82-015	This GL was never issued.	NA	
GL 82-016	NUREG-0737 Technical Specifications	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 82-017	Inconsistency of Requirements Between 50.54(T) and 50.15	NA	Info
GL 82-018	Reactor Operator and Senior Reactor Operator Requalification Examinations	NA	Info
GL 82-019	Submittal of Copies of Documentation to NRC - Copy Requirements for Emergency Plans and Physical Security Plans	NA	Info
GL 82-020	Guidance for Implementing the Standard Review Plan Rule	NA	Info
GL 82-021	Fire Protection Audits	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 82-022	Congressional Request for Information Concerning Steam Generator Tube Integrity	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 82-023	Inconsistency Between Requirements of 10CFR 73.40(d) and Standard Technical Specifications For Performing Audits of Safeguards Contingency Plans	NA	Info
GL 82-024	Safety Relief Valve Quencher Loads: BWR MARK II and III Containments	NA	Boiling Water Reactor
GL 82-025	Integrated IAEA Exercise for Physical Inventory at LWRS	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 82-026	NUREG-0744, REV. 1, "Pressure Vessel Material Fracture Toughness"	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 82-027	Transmittal of NUREG-0763, "Guidelines For Confirmatory In-Plant Tests of Safety-Relief Valve Discharge for BWR Plants"	NA	Boiling Water Reactor
GL 82-028	Inadequate Core Cooling Instrumentation System	CO 07	LICENSE CONDITION: Detectors for Inadequate core cooling (II.F.2) In the original SER, the review of the ICC instrumentation was incomplete. The January 24, 1992, letter superseded the previous responses on this issue. TVA letter for Units 1 and 2 dated January 24, 1992, committed to install Westinghouse ICCM-86 and associated hardware. NRC completed the review for Units 1 and 2 in SSER10. For Unit 2 due to obsolescence of the ICCM-86 system, TVA intends to install the Westinghouse Common Q Post-Accident Monitoring System. Unit 2 Action: Install Westinghouse Common Q PAM system. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. Subsumed as part of NRC staff review of Instrumentation and Controls submitted April 8, 2010." --- --- REVISION 07 UPDATE: NRC Inspection Report 391/2011-608 closed GL 82-028.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 82-029	This GL was never issued.	NA	
GL 82-030	Filings Related to 10 CFR 50 Production and Utilization Facilities	NA	Info
GL 82-031	This GL was never issued.	NA	
GL 82-032	Draft Steam Generator Report (SAI)	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 82-033	Supplement to NUREG-0737, "Requirements for Emergency Response Capability"	CI	"Safety Parameter Display System" (SPDS) / "Requirements for Emergency Response Capability" - NRC reviewed in SSER5, SSER6, and 18.2.2 of SSER15. Unit 2 Action: Install SPDS and have it operational prior to start-up after the first refueling outage.
GL 82-034	This GL was never issued.	NA	
GL 82-035	This GL was never issued.	NA	
GL 82-036	This GL was never issued.	NA	
GL 82-037	This GL was never issued.	NA	
GL 82-038	Meeting to Discuss Developments for Operator Licensing Examinations	NA	Info
GL 82-039	Problems With Submittals of Subsequent Information of CURT 73.21 For Licensing Reviews	NA	Info
GL 83-001	Operator Licensing Examination Site Visit	NA	Info
GL 83-002	NUREG-0737 Technical Specifications	NA	Boiling Water Reactor
GL 83-003	This GL was never issued.	NA	

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 83-004	Regional Workshops Regarding Supplement 1 to NUREG-0737, "Requirements For Emergency Response Capability"	NA	Info
GL 83-005	Safety Evaluation of "Emergency Procedure Guidelines, Revision 2," June 1982	NA	Boiling Water Reactor
GL 83-006	Certificates and Revised Format For Reactor Operator and Senior Reactor Operator Licenses	NA	Info
GL 83-007	The Nuclear Waste Policy Act of 1982	NA	Info
GL 83-008	Modification of Vacuum Breakers on Mark I Containments	NA	Boiling Water Reactor
GL 83-009	Review of Combustion Engineering Owners' Group Emergency Procedures Guideline Program	NA	Applies only to Combustion Engineering designed plants
GL 83-010a	Resolution of TMI Action Item II.K.3.5., "Automatic Trip of Reactor Coolant Pumps"	NA	Applies only to Combustion Engineering designed plants
GL 83-010b	Resolution of TMI Action Item II.K.3.5., "Automatic Trip of Reactor Coolant Pumps"	NA	Applies only to Combustion Engineering designed plants
GL 83-010c	Resolution of TMI Action Item II.K.3.5., "Automatic Trip of Reactor Coolant Pumps"	CI	TVA: letters dated January 5, 1984 and June 25, 1984 NRC: letter dated June 8, 1990. ---------- Unit 2 Action: Incorporate emergency response guidelines into applicable procedures. [WAS "NOTE 3."]
GL 83-010d	Resolution of TMI Action Item II.K.3.5., "Automatic Trip of Reactor Coolant Pumps"	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 83-010e	Resolution of TMI Action Item II.K.3.5., "Automatic Trip of Reactor Coolant Pumps"	NA	Applies only to Babcock and Wilcox designed plants

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 83-010f	Resolution of TMI Action Item II.K.3.5., "Automatic Trip of Reactor Coolant Pumps"	NA	Applies only to Babcock and Wilcox designed plants
GL 83-011	Licensee Qualification for Performing Safety Analyses in Support of Licensing Actions	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 83-012	Issuance of NRC FORM 398 - Personal Qualifications Statement - Licensee	NA	Info
GL 83-013	Clarification of Surveillance Requirements for HEPA Filters and Charcoal Absorber Units In Standard Technical Specifications on ESF Cleanup Systems	NA	Info
GL 83-014	Definition of "Key Maintenance Personnel," (Clarification of Generic Letter 82-12)	NA	Info
GL 83-015	Implementation of Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice & Inservice Examinations, Revision 1"	NA	Info
GL 83-016	Transmittal of NUREG-0977 Relative to the ATWS Events at Salem Generating Station, Unit No.1	NA	Info
GL 83-016a	Transmittal of NUREG-0977 Relative to the ATWS Events at Salem Generating Station, Unit No.1	NA	Info
GL 83-017	Integrity of Requalification Examinations for Renewal of Reactor Operator and Senior Reactor Operator Licenses	NA	Info
GL 83-018	NRC Staff Review of the BWR Owners' Group (BWROG) Control Room Survey Program	NA	Boiling Water Reactor
GL 83-019	New Procedures for Providing Public Notice Concerning Issuance of Amendments to Operating Licenses	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 83-020	Integrated Scheduling for Implementation of Plant Modifications	NA	Info
GL 83-021	Clarification of Access Control Procedures for Law Enforcement Visits	NA	Info
GL 83-022	Safety Evaluation of "Emergency Response Guidelines"	NA	Info
GL 83-023	Safety Evaluation of "Emergency Procedure Guidelines"	NA	Applies only to Combustion Engineering designed plants
GL 83-024	TMI Task Action Plan Item I.G.1, "Special Low Power Testing and Training," Recommendations for BWRs	NA	Boiling Water Reactor
GL 83-025	This GL was never issued.	NA	
GL 83-026	Clarification Of Surveillance Requirements For Diesel Fuel Impurity Level Tests	NA	Info
GL 83-027	Surveillance Intervals in Standard Technical Specifications	NA	Info
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 1.2 – Post Trip Review Data and Information Capability	C	TVA: letters dated November 7, 1983 and December 4, 1987 NRC: IR 50-390, 391/86-04
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 2.1 – Equipment Classification and Vendor Interface (Reactor Trip System Components)	CI 06	TVA: letters dated November 7, 1983 and August 24, 1990 NRC: letters dated October 20, 1986 and June 18, 1990 ---------- Unit 2 Action: Ensure that required information on Critical Structures and Components is properly incorporated into procedures. [WAS "NOTE 3."] ---------- ---------- REVISION 06 UPDATE:

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			Confirmed that required information on Critical Structures and Components is properly incorporated into procedures.
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 2.2 – Equipment Classification and Vendor Interface (All SR Components)"	CI	Unit 2 Action: Enter engineering component background data in INPO's Equipment Performance and Information Exchange System (EPIX) for Unit 2.
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 3.1 – Post-Maintenance Testing (Reactor Trip System Components)	S 02	TVA: letters dated November 7, 1983, January 17, 1986 and November 1, 1993 NRC: letters dated December 10, 1985, October 27, 1986, and July 2, 1990; IR 390, 391/86-04 ---------- Unit 2 Action: Test and maintenance procedures and Technical Specifications will include post-maintenance operability testing of safety-related components of the reactor trip system. ---------- ---------- REVISION 02 UPDATE: Developmental Revision A of the Unit 2 TS (including the TS Bases) was submitted on March 4, 2009. The Bases for TS Surveillance Requirement 3.0.1 states, in part, "Upon completion of maintenance, appropriate post maintenance testing is required to declare equipment OPERABLE. This includes ensuring applicable Surveillances are not failed and their most recent performance is in accordance with SR 3.0.2."
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 3.2 – Post-Maintenance Testing (All SR Components)	S 06	TVA: letters dated November 7, 1983, January 17, 1986 and November 1, 1993 NRC: letters dated December 10, 1985, October 27, 1986, and July 2, 1990; IR 390, 391/86-04 ---------- Unit 2 Action: Test and maintenance procedures and Technical Specifications will include post-maintenance operability testing of other (than reactor trip system) safety-related components. ---------- ---------- REVISION 02 UPDATE: Developmental Revision A of the Unit 2 TS (including the TS Bases) was

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			submitted on March 4, 2009. The Bases for TS Surveillance Requirement 3.0.1 states, in part, "Upon completion of maintenance, appropriate post maintenance testing is required to declare equipment OPERABLE. This includes ensuring applicable Surveillances are not failed and their most recent performance is in accordance with SR 3.0.2." REVISION 06 UPDATE: Watts Bar's Preventative Maintenance Program is not unit specific; no further action is required for Unit 2.
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 4.1 – Reactor Trip System Reliability (Vendor Related Modifications)	C 07	TVA: letter dated May 19, 1986 Unit 2 Action: Confirm vendor-recommended DS416 breaker modifications are implemented. REVISION 06 UPDATE: NRC Inspection Report 391/2011-602 closed GL 83-028, Item 4.1. REVISION 07 UPDATE: New Unit 2 DS-416 breakers were purchased from Westinghouse; these new breakers have the required modifications already installed.
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 4.2 – Reactor Trip System Reliability (Preventive Maintenance and Surveillance Program for Reactor Trip Breakers)	S 02	TVA: letters dated November 7, 1983, February 10, 1986, and May 19, 1986 NRC: letters dated July 26, 1985 and June 18, 1992; SSER 16 Unit 2 Action: Ensure maintenance instruction procedure and Technical Specifications support reliable reactor trip breaker operation. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 TS was submitted on February 2, 2010. Item 17. (Reactor Trip Breakers) of TS Table 3.3.1-1 states the requirement for the reactor trip breakers.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 4.3 – Reactor Trip System Reliability (Automatic Actuation of Shunt Trip Attachment)	C	TVA: letters dated November 7, 1983, March 22, 1985 NRC: IR 50-390/86-04 and 50-391/86-04; letter dated June 18, 1990
GL 83-028	"Required Actions Based on Generic Implications of Salem ATWS Events: 4.5 – Reactor Trip System Reliability (Automatic Actuation of Shunt Trip Attachment)	S 02	TVA: letters dated November 7, 1983 and July 26, 1985 NRC: letters dated June 28, 1990 and October 9, 1990; SSERs 5 and 16 ---------- Unit 2 Action: Address in Technical Specifications, as appropriate. ---------- ---------- REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. Item 18. (Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms) of TS Table 3.3.1-1 states the requirement for the shunt trip attachment.
GL 83-029	This GL was never issued.	NA	
GL 83-030	Deletion of Standard Technical Specifications Surveillance Requirement 4.8.1.1.2.d.6 For Diesel Generator Testing	NA	Info
GL 83-031	Safety Evaluation of "Abnormal Transient Operating Guidelines"	NA	Applies only to Babcock and Wilcox designed plants
GL 83-032	NRC Staff Recommendations Regarding Operator Action for Reactor Trip and ATWS	NA	Info
GL 83-033	NRC Positions on Certain Requirements of Appendix R to 10 CFR 50	NA	Info
GL 83-034	This GL was never issued.	NA	

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 83-035	Clarification of TMI Action Plan Item II.K.3.31	NA	Info
GL 83-036	NUREG-0737 Technical Specifications	NA	Boiling Water Reactor
GL 83-037	NUREG-0737 Technical Specifications	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 83-038	NUREG-0965, "NRC Inventory of Dams"	NA	Info
GL 83-039	Voluntary Survey of Licensed Operators	NA	Info
GL 83-040	Operator Licensing Examination	NA	Info
GL 83-041	Fast Cold Starts of Diesel Generators	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 83-042	Clarification to GL 81-07 Regarding Response to NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants"	NA	Info
GL 83-043	Reporting Requirements of 10 CFR 50, Sections 50.72 and 50.73, and Standard Technical Specifications	NA	Info
GL 83-044	Availability of NUREG-1021, "Operator Licensing Examiner Standards"	NA	Info
GL 84-001	NRC Use Of The Terms "Important To Safety" and "Safety Related"	NA	Info
GL 84-002	Notice of Meeting Regarding Facility Staffing	NA	Info
GL 84-003	Availability of NUREG-0933, "A Prioritization of Generic Safety Issues"	NA	Info
GL 84-004	Safety Evaluation of Westinghouse Topical Reports Dealing with Elimination of Postulated Pipe Breaks in PWR Primary Main Loops	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 84-005	Change to NUREG-1021, "Operator Licensing Examiner Standards"	NA	Info
GL 84-006	Operator and Senior Operator License Examination Criteria For Passing Grade	NA	Does not apply to power reactor.
GL 84-007	Procedural Guidance for Pipe Replacement at BWRs	NA	Boiling Water Reactor
GL 84-008	Interim Procedures for NRC Management of Plant-Specific Backfitting	NA	Info
GL 84-009	Recombiner Capability Requirements of 10 CFR 50.44(c)(3)(ii)	NA	Boiling Water Reactor
GL 84-010	Administration of Operating Tests Prior to Initial Criticality	NA	Info
GL 84-011	Inspection of BWR Stainless Steel Piping	NA	Boiling Water Reactor
GL 84-012	Compliance With 10 CFR Part 61 and Implementation of Radiological Effluent Technical Specifications (RETs) and Attendant Process Control Program (PCP)	NA	Info
GL 84-013	Technical Specification for Snubbers	NA	Info
GL 84-014	Replacement and Requalification Training Program	NA	Info
GL 84-015	Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability	NA	Info
GL 84-016	Adequacy of On-Shift Operating Experience for Near Term Operating License Applicants	NA	Info
GL 84-017	Annual Meeting to Discuss Recent Developments Regarding Operator Training, Qualifications, and Examinations	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 84-018	Filing of Applications for Licenses and Amendments	NA	Does not apply to power reactor.
GL 84-019	Availability of Supplement 1 to NUREG-0933, "A Prioritization of Generic Safety Issues"	NA	Info
GL 84-020	Scheduling Guidance for Licensee Submittals of Reloads That Involve Unreviewed Safety Questions	NA	Info
GL 84-021	Long Term Low Power Operation in Pressurized Water Reactors	NA	Info
GL 84-022	This GL was never issued.	NA	
GL 84-023	Reactor Vessel Water Level Instrumentation in BWRs	NA	Boiling Water Reactor
GL 84-024	Certification of Compliance to 10 CFR 50.49, Environmental Qualification of Electric Equipment Important To Safety For Nuclear Power Plants	CI	See Special Program for Environmental Qualification.
GL 85-001	Fire Protection Policy Steering Committee Report	NA	Only issued as draft
GL 85-002	Recommended Actions Stemming From NRC Integrated Program for the Resolution of Unresolved Safety Issues Regarding Steam Generator Tube Integrity	CI	TVA responded to the GL on June 17, 1985. Unit 2 Action: Perform SG inspection.
GL 85-003	Clarification of Equivalent Control Capacity for Standby Liquid Control Systems	NA	Boiling Water Reactor
GL 85-004	Operating Licensing Examinations	NA	Info
GL 85-005	Inadvertent Boron Dilution Events	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 85-006	Quality Assurance Guidance for ATWS Equipment That Is Not Safety-Related	NA	Info
GL 85-007	Implementation of Integrated Schedules for Plant Modifications	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 85-008	10 CFR 20.408 Termination Reports - Format	NA	Info
GL 85-009	Technical Specifications For Generic Letter 83-28, Item 4.3	NA	Info
GL 85-010	Technical Specification For Generic Letter 83-28, Items 4.3 and 4.4	NA	Applies only to Babcock and Wilcox designed plants
GL 85-011	Completion of Phase II of "Control of Heavy Loads at Nuclear Power Plants," NUREG-0612	C	See GL 81-07.
GL 85-012	Implementation Of TMI Action Item II.K.3.5, "Automatic Trip Of Reactor Coolant Pumps"	CI	"Implementation of TMI Item II.K.3.5" – Reviewed in 15.5.4 of original 1982 SER; became License Condition 35. The staff determined that their review of Item II.K.3.5 did not have to be completed to support the full power license and considered this license condition resolved in SSER4. The item was further reviewed in Appendix EE of SSER16. Unit 2 Action: Implement modifications as required.
GL 85-013	Transmittal Of NUREG-1154 Regarding The Davis-Besse Loss Of Main And Auxiliary Feedwater Event	NA	Info
GL 85-014	Commercial Storage At Power Reactor Sites Of Low Level Radioactive Waste Not Generated By The Utility	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 85-015	Information On Deadlines For 10 CFR 50.49, "Environmental Qualification Of Electric Equipment Important To Safety At Nuclear Power Plants"	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 85-016	High Boron Concentrations	NA	Info
GL 85-017	Availability Of Supplements 2 and 3 To NUREG-0933, "A Prioritization Of Generic Safety Issues"	NA	Info
GL 85-018	Operator Licensing Examinations	NA	Info
GL 85-019	Reporting Requirements On Primary Coolant Iodine Spikes	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 85-020	Resolution Of Generic Issue 69: High Pressure Injection/Make-up Nozzle Cracking In Babcock And Wilcox Plants	NA	Applies only to Babcock and Wilcox designed plants
GL 85-021	This GL was never issued.	NA	
GL 85-022	Potential For Loss Of Post-LOCA Recirculation Capability Due To Insulation Debris Blockage	NA	Info
GL 86-001	Safety Concerns Associated With Pipe Breaks In The BWR Scram System	NA	Boiling Water Reactor
GL 86-002	Technical Resolution of Generic Issue B-19 - Thermal Hydraulic Stability	NA	Boiling Water Reactor
GL 86-003	Applications For License Amendments	NA	Info
GL 86-004	Policy Statement On Engineering Expertise On Shift	C 01	TVA responded to GL 86-04 on May 29, 1986. TVA provides engineering expertise on shift in the form of a dedicated Shift Technical Advisor (STA) or an STA qualified Senior Reactor Operator.
GL 86-005	Implementation Of TMI Action Item II.K.3.5, "Automatic Trip Of Reactor Coolant Pumps"	NA	Applies only to Babcock and Wilcox designed plants
GL 86-006	Implementation Of TMI Action Item II.K.3.5, "Automatic Trip of Reactor Coolant Pumps"	NA	Applies only to Combustion Engineering designed plants
GL 86-007	Transmittal of NUREG-1190 Regarding The San Onofre Unit 1 Loss of Power and Water Hammer Event	NA	Info
GL 86-008	Availability of Supplement 4 to NUREG-0933, "A Prioritization of Generic Safety Issues"	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 86-009	Technical Resolution of Generic Issue B-59, (N-1) Loop Operation in BWRs and PWRs	S 02	N-1 Loop operation was addressed in original 1982 SER (4.4.7). Unit 2 Action: Confirm Technical Specifications prohibit (N-1) Loop Operation. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS LCO 3.4.4 requires that four Reactor Coolant System loops be operable and in operation during Modes 1 and 2.
GL 86-010	Implementation of Fire Protection Requirements	NA	Info
GL 86-010, S1	Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Trains Within the Same Fire Area	NA	Info
GL 86-011	Distribution of Products Irradiated in Research	NA	Does not apply to power reactor.
GL 86-012	Criteria for Unique Purpose Exemption From Conversion From The Use of Heu Fuel	NA	Does not apply to power reactor.
GL 86-013	Potential Inconsistency Between Plant Safety Analyses and Technical Specifications	NA	Applies only to Babcock and Wilcox and Combustion Engineering designed plants
GL 86-014	Operator Licensing Examinations	NA	Info
GL 86-015	Information Relating To Compliance With 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important To Safety For Nuclear Power Plants"	NA	Info
GL 86-016	Westinghouse ECCS Evaluation Models	NA	Info
GL 86-017	Availability of NUREG-1169, "Technical Findings Related to Generic Issue C-8, BWR MSIC Leakage And Treatment Methods"	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 87-001	Public Availability Of The NRC Operator Licensing Examination Question Bank	NA	Info
GL 87-002 and GL 87-003	Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, USI A-46	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 87-004	Temporary Exemption From Provisions Of The FBI Criminal History Rule For Temporary Workers	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 87-005	Request for Additional Information on Assessment of License Measures to Mitigate and/or Identify Potential Degradation of Mark I Drywells	NA	Boiling Water Reactor
GL 87-006	Periodic Verification of Leak Tight Integrity of Pressure Isolation Valves	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 87-007	Information Transmittal of Final Rulemaking For Revisions To Operator Licensing - 10 CFR 55 And Confirming Amendments	NA	Info
GL 87-008	Implementation of 10 CFR 73.55 Miscellaneous Amendments and Search Requirements	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 87-009	Sections 3.0 And 4.0 of Standard Tech Specs on Limiting Conditions For Operation And Surveillance Requirements	NA	Info
GL 87-010	Implementation of 10 CFR 73.57, Requirements For FBI Criminal History Checks	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 87-011	Relaxation in Arbitrary Intermediate Pipe Rupture Requirements	NA	Info
GL 87-012	Loss of Residual Heat Removal While The Reactor Coolant System is Partially Filled	C	This GL was superseded by GL 88-17.
GL 87-013	Integrity of Requalification Examinations At Non-Power Reactors	NA	Does not apply to power reactor.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 87-014	Operator Licensing Examinations	NA	Info
GL 87-015	Policy Statement On Deferred Plants	NA	Info
GL 87-016	Transmittal of NUREG-1262, "Answers To Questions On Implementation of 10 CFR 55 On Operators' Licenses"	NA	Info
GL 88-001	NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping	NA	Boiling Water Reactor
GL 88-002	Integrated Safety Assessment Program II	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 88-003	Resolution of GSI 93, "Steam Binding of Auxiliary Feedwater Pumps"	CI	TVA: letter June 3, 1988. NRC letters dated February 17, 1988 and July 20, 1988 NRC: SSER 16 ---------- NRC accepted approach in letter dated July 20, 1988, and reviewed response in Appendix EE of SSER16. Unit 2 Action: Procedures and hardware will be in place to ensure recognition of indications of steam binding and maintenance of system operability until check valves are repaired and back leakage stopped.
GL 88-004	Distribution of Gems Irradiated in Research Reactors	NA	Does not apply to power reactor.
GL 88-005	Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR plants	CI 06	NRC acceptance letter dated August 8, 1990 for both units. Unit 2 Action: Implement program. ---------- ---------- REVISION 06 UPDATE: The program has been implemented on Unit 2.
GL 88-006	Removal of Organization Charts from Technical Specification Administrative Control Requirements	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 88-007	Modified Enforcement Policy Relating to 10 CFR 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants"	CI	See Special Program for Environmental Qualification.
GL 88-008	Mail Sent or Delivered to the Office of Nuclear Reactor Regulation	NA	Info
GL 88-009	Pilot Testing of Fundamentals Examination	NA	Boiling Water Reactor
GL 88-010	Purchase of GSA Approved Security Containers	NA	Info
GL 88-011	NRC Position on Radiation Embrittlement of Reactor Vessel Material and its Impact on Plant Operations	S 02	NRC acceptance letter dated June 29, 1989, for both units. Unit 2 Action: Submit Pressure Temperature curves. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. WCAP-17035-NP "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation" was submitted with the TS.
GL 88-012	Removal of Fire Protection Requirements from Technical Specification	NA	Info
GL 88-013	Operator Licensing Examinations	NA	Info
GL 88-014	Instrument Air Supply System Problems Affecting Safety-Related Equipment	CI 04	NRC letter dated July 26, 1990, closing the issue. Unit 2 Action: Complete Unit 2 implementation. REVISION 04 UPDATE: The compressed air system is a common system at Watts Bar; therefore, the requirements for this GL have been satisfied for Unit 2. Watts Bar revised the response in a letter dated July 14, 1995. NRC letter dated July 27, 1995, stated that their conclusion as stated on July 26,1990, had not changed and that their effort was complete.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 88-015	Electric Power Systems - Inadequate Control Over Design Process	NA	Info
GL 88-016	Removal of Cycle-Specific Parameter Limits from Technical Specifications	NA	Info
GL 88-017	Loss of Decay Heat Removal	CI	NRC acceptance letter dated March 8, 1995 (Unit 1). Unit 2 Action: Implement modifications to provide RCS temperature, RV level and RHR system performance.
GL 88-018	Plant Record Storage on Optical Disks	NA	Info
GL 88-019	Use of Deadly Force by Licensee Guards to Prevent Theft of Special Nuclear Material	NA	Does not apply to power reactor.
GL 88-020	Individual Plant Examination for Severe Accident Vulnerabilities	C 08	Unit 2 Action: Complete evaluation for Unit 2. REVISION 02 UPDATE: The Probabilistic Risk Assessment Individual Plant Examination Summary Report was submitted on February 9, 2010. REVISION 04 UPDATE: The Individual Plant Examination of External Events Design Report was submitted on April 30, 2010. REVISION 06 UPDATE: The NRC issued Requests for Additional Information (RAIs) on November 12, 2010. TVA responded to the RAIs on December 17, 2010, and April 1, 2011. REVISION 07 UPDATE: SSER24 contained the following for NRC Action for GL 88-020 through Supplement 3: "Closed. NRC letter dated August 12, 2011 (ADAMS Accession No. ML111960228)."

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			REVISION 08 UPDATE: SSER25 contained the following for NRC Action for GL 88-020, Supplements 4 and 5: "Closed. NRC letter dated September 20, 2011 (ADAMS Accession No. ML111960300)."
GL 89-001	Implementation of Programmatic and Procedural Controls for Radiological Effluent Technical Specifications	**NA**	Info
GL 89-002	Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products	**C** **08**	GL 89-02 did not require a response. WBN Unit 2 program for procurement and dedication of materials is based in part on and complies with the guidance of GL 89-02. The program is implemented through project procedures. REVISION 08 UPDATE: NRC Inspection Report 391/2012-604 closed this item.
GL 89-003	Operator Licensing Examination Schedule	**NA**	Info
GL 89-004	Guidelines on Developing Acceptable Inservice Testing Programs	**OV**	NRC reviewed in 3.9.6 of SSER14 (Unit 1). Unit 2 Action: Submit an ASME Section XI Inservice Test Program for the first ten year interval six months before receiving an Operating License.
GL 89-005	Pilot Testing of the Fundamentals Examination	**NA**	Info
GL 89-006	Task Action Plan Item I.D.2 – Safety Parameter Display System – 10 CFR 50.54(f)	**CI**	"Safety Parameter Display System" (SPDS) / "Requirements for Emergency Response Capability" - NRC reviewed in SSER5, SSER6, and 18.2.2 of SSER15. Unit 2 Action: Install SPDS and have it operational prior to start-up after the first refueling outage.
GL 89-007	Power Reactor Safeguards Contingency Planning for Surface Vehicle Bombs	**C**	TVA: letter dated October 31, 1989 NRC: memo dated June 26, 1990

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 89-008	Erosion/Corrosion-Induced Pipe Wall Thinning	CI	Unit 1 Flow Accelerated Corrosion Program reviewed in IR 390/94-89 (February 1995). Unit 2 Actions: * Prepare procedure, and * perform baseline inspections.
GL 89-009	ASME Section III Component Replacements	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 89-010	Safety-Related Motor-Operated Valve Testing and Surveillance	CI	NRC accepted approach in September 14, 1990, letter and reviewed in Appendix EE of SSER16. Unit 2 Action: Implement pressure testing and surveillance program for safety-related MOVs, satisfying the intent of GL 89-10.
GL 89-010 or GL 96-005	Involves Main Steam Isolation Valves	NA	Boiling Water Reactor
GL 89-011	Resolution of Generic Issue 101, "Boiling Water Reactor Water Level Redundancy"	NA	Boiling Water Reactor
GL 89-012	Operator Licensing Examination	NA	Info
GL 89-013	Service Water System Problems Affecting Safety-Related Equipment	CI 06	NRC letters dated July 9, 1990 and June 13, 1997, accepting approach. Unit 2 Actions: 1) Implement initial performance testing of the heat exchangers; and 2) Establish eddy current baseline data for the Containment Spray heat exchangers. REVISION 06 UPDATE: NRC Inspection Report 391/2011-602 closed GL 89-013.
GL 89-014	Line-Item Improvements in Technical Specifications - Removal of 3.25 Limit on Extending Surveillance Intervals	NA	Info
GL 89-015	Emergency Response Data System	NA	Info
GL 89-016	Installation of a Hardened Wetwell Vent	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 89-017	Planned Administrative Changes to the NRC Operator Licensing Written Examination Process	NA	Info
GL 89-018	Resolution of Unresolved Safety Issues A-17, "Systems Interactions in Nuclear Power Plants"	NA	Info
GL 89-019	Request for Actions Related to Resolution of Unresolved Safety Issue A-47, "Safety Implication of Control Systems in LWR Nuclear Power Plants" Pursuant to 10 CFR 50.54(f)	CI	TVA responded by letter dated March 22, 1990. NRC acceptance letter dated October 24, 1990, for both units. Unit 2 Action: Perform evaluation of common mode failures due to fire.
GL 89-020	Protected Area Long-Term Housekeeping	NA	Does not apply to power reactor.
GL 89-021	Request for Information Concerning Status of Implementation of Unresolved Safety Issue (USI) Requirements	CO 07	TVA responded to GL 89-21 with the status of USIs for both units on November 29, 1989. NRC provided an assessment of WBN USI status on May 1, 1990. The NRC assessment included a list of incomplete USIs for WBN. USIs were initially reviewed for WBN in the SER Appendix C. USIs were subsequently reviewed in SSER 15 Appendix C (June 1995) and SSER 16 (September 1995). Unit 2 actions: * Provide a status of WBN Unit 2 USIs. * Complete implementation of USIs. --- --- REVISION 02 UPDATE: Status of USIs was provided by Enclosure 2 of TVA letter dated September 26, 2008. The applicable USIs are either closed, deleted, or captured in either the SER Framework or the Generic Communications Framework, or they are part of the CAPs and SPs. --- --- REVISION 06 UPDATE: Updated status of USIs was provided on January 25, 2011. --- --- REVISION 07 UPDATE: Page 1-30 of SSER23 provided the following as NRC Action for this GL:

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			"Closed. See Appendix C of SSER23."
GL 89-022	Potential For Increased Roof Loads and Plant Area Flood Runoff Depth At Licensed Nuclear Power Plants Due To Recent Change In Probable Maximum Precipitation Criteria Developed by the National Weather Service	C	TVA: letter dated December 16, 1981 ---------- Answer to informal question provided in TVA letter dated December 16, 1981, and subsequently included in FSAR. GL did not require a response. No further action required.
GL 89-023	NRC Staff Responses to Questions Pertaining to Implementation of 10 CFR Part 26	NA	Info
GL 90-001	Request for Voluntary Participation in NRC Regulatory Impact Survey	NA	Info
GL 90-002	Alternative Requirements for Fuel Assemblies in the Design Features Section of Technical Specifications	NA	Info
GL 90-003	Relaxation of Staff Position in Generic Letter 83-28, Item 2.2 Part 2 "Vendor Interface for Safety-Related Components"	NA	Info
GL 90-004	Request for Information on the Status of Licensee Implementation of GSIs Resolved with Imposition of Requirements or CAs	C	TVA responded on June 23, 1990
GL 90-005	Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping	NA	Info
GL 90-006	Resolution of Generic Issues 70, "PORV and Block Valve Reliability," and 94, "Additional LTOP Protection for PWRs"	S 02	NRC letter dated January 9, 1991, accepted TVA's response for both units. Unit 2 Actions: 1) Revise operating instruction and surveillance procedure; and 2) Incorporate testing requirements in the Technical Specifications. ---------- REVISION 02 UPDATE: Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			TS Surveillance Requirement 3.4.11.2 specifies the required testing of each PORV.
GL 90-007	Operator Licensing National Examination Schedule	NA	Info
GL 90-008	Simulation Facility Exemptions	NA	Info
GL 90-009	Alternative Requirements for Snubber Visual Inspection Intervals and Corrective Actions	NA	Info
GL 91-001	Removal of the Schedule for the Withdrawal of Reactor Vessel Material Specimens from Technical Specifications	NA	Info
GL 91-002	Reporting Mishaps Involving LLW Forms Prepared for Disposal	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 91-003	Reporting of Safeguards Events	NA	Info
GL 91-004	Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle	NA	Info
GL 91-005	Licensee Commercial-Grade Procurement and Dedication Programs	NA	Info
GL 91-006	Resolution of Generic Issue A-30, "Adequacy of Safety-Related DC Power Supplies," Pursuant to 10 CFR 50.54(f)	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 91-007	GI-23, "Reactor Coolant Pump Seal Failures" and Its Possible Effect on Station Blackout	NA	Info
GL 91-008	Removal of Component Lists from Technical Specifications	NA	Info
GL 91-009	Modification of Surveillance Interval for the Electrical Protective Assemblies in Power Supplies for the Reactor Protection System	NA	Boiling Water Reactor

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 91-010	Explosives Searches at Protected Area Portals	NA	Does not apply to power reactor.
GL 91-011	Resolution of Generic Issues A-48, "LCOs for Class 1E Vital Instrument Buses", and 49, "Interlocks and LCOs for Class 1E Tie Breakers," Pursuant to 10 CFR 50.54	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 91-012	Operator Licensing National Examination Schedule	NA	Info
GL 91-013	Request for Information Related to Resolution of Generic Issue 130, "Essential Service Water System Failures @ Multi-Unit Sites"	NA	Addressed to specific (non-TVA) plants.
GL 91-014	Emergency Telecommunications	NA	Info
GL 91-015	Operating Experience Feedback Report, Solenoid-Operated Valve Problems at U.S. Reactors	NA	Info
GL 91-016	Licensed Operators' and Other Nuclear Facility Personnel Fitness for Duty	NA	Info
GL 91-017	Generic Safety Issue 29, "Bolting Degradation or Failure in Nuclear Power Plants"	NA	Info
GL 91-018	Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability	NA	GL 91-18 has been superseded by RIS 2005-20.
GL 91-019	Information to Addressees Regarding New Telephone Numbers for NRC Offices Located in One White Flint North	NA	Info
GL 92-001	Reactor Vessel Structural Integrity	C	By letter dated May 11, 1994, for both units NRC confirmed TVA had provided the information requested in GL 92-01. NRC issued GL 92-01 revision 1, supplement 1 on May 19, 1995. By letter dated July 26, 1996, NRC closed GL 92-01, Revision 1, Supplement 1 for both Watts Bar units.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 92-002	Resolution of Generic Issue 79, "Unanalyzed Reactor Vessel (PWR) Thermal Stress During Natural Convection Cooldown"	NA	Info
GL 92-003	Compilation of the Current Licensing Basis: Request for Voluntary Participation in Pilot Program	NA	Info
GL 92-004	Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(f)	NA	Boiling Water Reactor
GL 92-005	NRC Workshop on the Systematic Assessment of Licensee Performance (SALP) Program	NA	Info
GL 92-006	Operator Licensing National Examination Schedule	NA	Info
GL 92-007	Office of Nuclear Reactor Regulation Reorganization	NA	Info
GL 92-008	Thermo-Lag 330-1 Fire Barriers	OV	TVA configurations for Thermo-Lag 330-1 were reviewed in SSER18 and accepted in NRC letter dated January 6, 1998 (includes a supplemental SE). Unit 2 Actions: 1) Review Watts Bar design and installation requirements for Thermolag 330-1 fire barrier system and evaluate the Thermolag currently installed in Unit 2. 2) Remove and replace, as required, or prepare an approved deviation.
GL 92-009	Limited Participation by NRC in the IAEA International Nuclear Event Scale	NA	Info
GL 93-001	Emergency Response Data System Test Program	NA	Addressed to specific plant(s).
GL 93-002	NRC Public Workshop on Commercial Grade Procurement and Dedication	NA	Info
GL 93-003	Verification of Plant Records	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 93-004	Rod Control System Failure and Withdrawal of Rod Control Cluster Assemblies, 10 CFR 50.54(f)	CO 06	NRC letter dated December 9, 1994, accepted TVA commitments for both units. Unit 2 Action: Implement modifications and testing. REVISION 06 UPDATE: NRC Inspection Report 391/2011-604 closed GL 93-004.
GL 93-005	Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation	NA	Info
GL 93-006	Research Results on Generic Safety Issue 106, "Piping and the Use of Highly Combustible Gases in Vital Areas"	NA	Info
GL 93-007	Modification of the Technical Specification Administrative Control Requirements for Emergency and Security Plans	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 93-008	Relocation of Technical Specification Tables of Instrument Response Time Limits	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 94-001	Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 94-002	Long-Term Solutions and Upgrade of Interim Operating Recommendations for Thermal-Hydraulic Instabilities in BWRs	NA	Boiling Water Reactor
GL 94-003	IGSCC of Core Shrouds in BWRs	NA	Boiling Water Reactor
GL 94-004	Voluntary Reporting of Additional Occupational Radiation Exposure Data	NA	Info
GL 95-001	NRC Staff Technical Position on Fire Protection for Fuel Cycle Facilities	NA	Does not apply to power reactor.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 95-002	Use of NUMARC/EPRI Report TR-102348, "Guideline on Licensing Digital Upgrades," in Determining the Acceptability of Performing Analog-to-Digital Replacements under 10 CFR 50.59	NA	Info
GL 95-003	Circumferential Cracking of Steam Generator Tubes	CI 06	NRC acceptance letter dated May 16, 1997 (Unit 1) – Initial response for Unit 2 on September 7, 2007. TVA responded to a request for additional information on December 17, 2007. Unit 2 Action: Perform baseline inspection. --- --- REVISION 02 UPDATE: Unit 2 Action: * Perform baseline inspection. * Evaluate or repair as necessary. --- On January 21, 2010, NRC issued the Safety Evaluation for the following Generic Letters: 1995-03, 1995-05, 1997-05, 1997-06, 2004-01, and 2006-01. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061)." --- 100% of the steam generator tubes have been inspected.
GL 95-004	Final Disposition of the Systematic Evaluation Program Lessons-Learned Issues	NA	Info

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 95-005	Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking	C 06	No specific action or response required by the GL; TVA responded on September 7, 2007. --- --- REVISION 02 UPDATE: On January 21, 2010, NRC issued the Safety Evaluation for the following Generic Letters: 1995-03, 1995-05, 1997-05, 1997-06, 2004-01, and 2006-01. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061)."
GL 95-006	Changes in the Operator Licensing Program	NA	Info
GL 95-007	Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves	CO 08	Unit 1 SER for GL 95-07 dated Sept 15, 1999 Unit 2 Actions: * Perform evaluation for pressure locking and thermal binding of safety related power-operated gate valves, and * take corrective actions for those valves identified as being susceptible. --- --- REVISION 03 UPDATE: April 1, 2010, letter committed to evaluate missing GL 89-10 motor-operated valves for susceptibility to pressure locking and thermal binding. --- --- REVISION 04 UPDATE: NRC letter dated July 29, 2010, provided RAIs on the GL. TVA letter dated July 30, 2010, answered the RAIs and provided the following commitments: * EDCRs 53292 and 53287 shall be implemented to eliminate the potential for pressure locking prior to startup. * Valves 2-FCV-63-25 and -26 will be evaluated for impact due to new parameters from the JOG Topical Report MPR 2524A prior to startup. ---

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			NRC issued the Safety Evaluation for GL 1995-007 on August 12, 2010. --- --- REVISION 06 UPDATE: TVA letter to NRC dated July 30, 2010, documented that none of the missing Watts Bar Unit 2 GL 89-10 valves are GL 95-07 valves. --- SSER22 contained the following for NRC Action: "Closed. NRC Letter dated August 12, 2010 (ADAMS Accession No. ML100190443)" --- --- REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
GL 95-008	10 CFR 50.54(p) Process for Changes to Security Plans Without Prior NRC Approval	NA	Info
GL 95-009	Monitoring and Training of Shippers and Carriers of Radioactive Materials	NA	Info
GL 95-010	Relocation of Selected Technical Specifications Requirements Related to Instrumentation	NA	Info
GL 96-001	Testing of Safety-Related Circuits	CI	TVA responded for both units on April 18, 1996. Unit 2 Action: Implement Recommendations.
GL 96-002	Reconsideration of Nuclear Power Plant Security Requirements Associated with an Internal Threat	NA	Info
GL 96-003	Relocation of the Pressure Temperature Limit Curves and Low Temperature Overpressure Protection System Limits	CI 06	No response required Unit 2 Actions: * Submit Pressure Temperature limits, and * similar to Unit 1, upon approval, incorporate into licensee-controlled document. --- --- REVISION 06 UPDATE:

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			The Pressure and Temperature Limits Report (PTLR) was submitted via TVA to NRC letter dated February 2, 2010. The PTLR was incorporated in the system description for the Reactor Coolant System (WBN2-68-4001).
GL 96-004	Boraflex Degradation in Spent Fuel Pool Storage Racks	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 96-005	Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves	CI	SE of TVA response to GL 96-05 dated July 21, 1999. Unit 2 Actions: * Implement the Joint Owner's Group recommended GL 96-05 MOV PV program, as described in Topical Report No. OG-97-018, and * begin testing during the first refueling outage after startup.
GL 96-006	Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions	C 06	NRC letter dated April 6, 1999, accepting TVA response for Unit 1. Unit 2 Action: Implement modification to provide containment penetration relief. --- --- REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 1996-006 on January 21, 2010. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML100130227)." --- Modification to provide containment penetration relief was implemented. --- NRC Inspection Report 391/2011-603 closed GL 96-006.
GL 96-007	Interim Guidance on Transportation of Steam Generators	NA	Item was applicable only to units with operating license at the time the item was issued.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 97-001	Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations	CI 06	NRC acceptance letter dated November 4, 1999 (Unit 1). Unit 2 Action: Provide a report to address the inspection program. REVISION 03 UPDATE: NRC issued the Safety Evaluation for Generic Letter 97-001 on June 30, 2010. REVISION 04 UPDATE: Corrected status from "OV" to "CI" due to NRC issuance of Safety Evaluation as noted in Revision 03 update. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated June 30, 2010 (ADAMS Accession No. ML100539515)"
GL 97-002	Revised Contents of the Monthly Operating Report	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 97-003	Annual Financial Update of Surety Requirements for Uranium Recovery Licensees	NA	Does not apply to power reactor.
GL 97-004	Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps	CI 06	NRC acceptance letter dated June 17, 1998 (Unit 1) – Initial response for Unit 2 on September 7, 2007. Unit 2 Actions: * Install new sump strainers, and * perform other modification-related activities identical to Unit 1. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 1997-004 on February 18, 2010. REVISION 06 UPDATE: See the REVISION 06 UPDATE for GL 04-002 for new commitments.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			--------- SSER22 contained the following for NRC Action: "Closed. NRC Letter dated February 18, 2010 (ADAMS Accession No. ML100200375)"
GL 97-005	Steam Generator Tube Inspection Techniques	CI 06	NRC acceptance letter dated September 22, 1998 (Unit 1) - Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Employ the same approach used on the original Unit 1 SGs. TVA responded to a request for additional information on December 17, 2007. --- --- REVISION 02 UPDATE: On January 21, 2010, NRC issued the Safety Evaluation for the following Generic Letters: 1995-03, 1995-05, 1997-05, 1997-06, 2004-01, and 2006-01. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061)"
GL 97-006	Degradation of Steam Generator Internals	CI 06	NRC acceptance letter dated October 19, 1999 (Unit 1) – Initial response for Unit 2 on September 7, 2007. TVA responded to a request for additional information on December 17, 2007. Unit 2 Action: Perform SG inspections during each refueling outage. --- --- REVISION 02 UPDATE: On January 21, 2010, NRC issued the Safety Evaluation for the following Generic Letters: 1995-03, 1995-05, 1997-05, 1997-06, 2004-01, and 2006-01. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061)"

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 98-001	Year 2000 Readiness of Computer Systems at Nuclear Power Plants	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 98-002	Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While in a Shutdown Condition	CI 07	Initial response for Unit 2 on September 7, 2007. Unit 2 Actions: 1) Review the ECCS designs to ensure they do not contain design features which can render them susceptible to common-cause failures; and 2) document the results. --- --- REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 1998-002 on March 3, 2010. --- --- REVISION 03 UPDATE: NRC issued the Safety Evaluation for Generic Letter 98-002 on May 11, 2010. This letter noted that it superseded the SE issued by NRC on March 3, 2010. --- April 1, 2010, letter committed to ensure that the guidance added to the Unit 1 procedure as a result of the review of NRC GL 98-02 is incorporated into the Unit 2 procedures. Specifically, when decreasing power, valve HCV-74-34, Refueling Water Return (normally locked closed valve) has a hold order placed with specific release criteria before entry into Mode 4 and to remove the hold order before entry into Mode 3 when returning to power. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated May 11, 2010 (ADAMS Accession No. ML101200155)" --- --- REVISION 07 UPDATE: The ECCS designs were reviewed and the results were documented.
GL 98-003	NMSS Licensees' and Certificate Holders' Year 2000 Readiness Programs	NA	Does not apply to power reactor.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 98-004	Potential for Degradation of the ECCS and the Containment Spray System After a LOCA Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment	CI 06	NRC closure letter dated November 24, 1999 (Unit 1). – Initial response for Unit 2 on September 7, 2007. Unit 2 Actions: * Install new sump strainers, and * perform other modification-related activities identical to Unit 1. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 1998-004 on February 1, 2010. REVISION 06 UPDATE: See the REVISION 06 UPDATE for GL 04-002 for new commitments. SSER22 contained the following for NRC Action: "Closed. NRC Letter dated February 1, 2010 (ADAMS Accession No. ML100260594)"
GL 98-005	Boiling Water Reactor Licensees Use of the BWRVIP-05 Report to Request Relief from Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds	NA	Boiling Water Reactor
GL 99-001	Recent Nuclear Material Safety and Safeguards Decision on Bundling Exempt Quantities	NA	Info
GL 99-002	Laboratory Testing of Nuclear Grade Activated Charcoal	NA	Item was applicable only to units with operating license at the time the item was issued.
GL 03-001	Control Room Habitability	S 06	Initial response for Unit 2 on September 7, 2007 Unit 2 Action: Incorporate TSTF-448 into Technical Specifications. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 2003-01 on February 1, 2010.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS Surveillance Requirement 3.7.10.4 requires performance of a Control Room Envelope (CRE) unfiltered air inleakage test in accordance with the CRE Habitability Program. TS 5.7.2.20 provides for the CRE Habitability Program. These portions of the Unit 2 TS were based on the Unit 1 TS which incorporated TSTF-448 per Amendment 70 (NRC approved A70 on 10/08/2008). --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated February 1, 2010 (ADAMS Accession No. ML100270076)"
GL 04-001	Requirements for Steam Generator Tube Inspection	CI 06	NRC acceptance letter dated April 8, 2005 (Unit 1) - Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Perform baseline inspection. --- --- REVISION 02 UPDATE: On January 21, 2010, NRC issued the Safety Evaluation for the following Generic Letters: 1995-03, 1995-05, 1997-05, 1997-06, 2004-01, and 2006-01. --- --- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061)" ---------- 100% of the steam generator tubes have been inspected.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 04-002	Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at PWRs	OV 06	NRC Audit Report dated February 7, 2007 (Unit 1) - Initial response for Unit 2 on September 7, 2007. Unit 2 Actions: * Install new sump strainers, and * perform other modification-related activities identical to Unit 1. ---------- ---------- REVISION 06 UPDATE: Additional TVA letters concerning GL 2004-02 were sent to the NRC on the following dates: - January 29, 2008, - May 19, 2008, - September 10, 2010, - March 4, 2011, and - April 29, 2011. The March 4, 2011, letter provided a response that superseded previous responses and commitments. It provided the following new commitments: - Unit 2 will install sump modifications per the requirements of Generic Letter (GL) 2004-02 prior to Unit 2 fuel load. - A confirmatory walkdown for loose debris will be performed on Unit 2 after containment work is completed and the containment has been cleaned. This walkdown will be completed prior to startup. - New throttle valves will be installed in the CVCS and SI injection lines to the RCS. The new valves will be opened sufficiently to preclude downstream blockage. - The current Unit 1 TVA protective coating program contains requirements for conducting periodic visual examinations of Coating Service Level I and Level II protective coatings. The Unit 2 program will be the same. - Procedural controls will be put in place at WBN Unit 2 to ensure that potential quantities of post-accident debris are maintained within the bounds of the analyses and design bases that support ECCS and CSS recirculation functions. - TVA will complete the WBN in-vessel downstream effects evaluation discussed in the supplemental response to Generic Letter 2004-02 following issuance of the final NRC Safety Evaluation Report (SER) for Topical Report No. WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous, and Chemical Debris in the Recirculating Fluid." - The design basis of the modified emergency sump strainer has been incorporated into the plant's current licensing basis. The WBN Unit 2 FSAR will be amended to include this information. ---------- - Unit 1 and Unit 2 share a common protective coatings program. - Amendment 103 to the Unit 2 FSAR was submitted to the NRC on

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			March 15, 2010. This amendment included the design basis of the modified emergency sump strainer.
GL 06-001	Steam Generator Tube Integrity and Associated Technical Specifications	S 06	Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Incorporate TSTF-449 into Technical Specifications. REVISION 02 UPDATE: On January 21, 2010, NRC issued the Safety Evaluation for the following Generic Letters: 1995-03, 1995-05, 1997-05, 1997-06, 2004-01, and 2006-01. Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS 5.7.2.12 is the Steam Generator (SG) Program. This program is implemented to ensure that SG tube integrity is maintained. Unit 2 TS 5.7.2.12 was based on Unit 1 TS 5.7.2.12. Unit 1 TS 5.7.2.1.12 was based on TSTF-449 (NRC approved Unit 1 TS A65 on 1/03/2006). REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061) (See Appendix HH)" The applicable item from SER22, Appendix HH for this item is Open item 6, "Verify implementation of TSTF-449. (TVA letter dated September 7, 2007, ADAMS Accession No. ML072570676)." TVA to NRC letter dated April 6, 2011 provided the following response to Open Item 6: "Amendment 65 to the Unit 1 TS revised the existing steam generator tube surveillance program and was modeled after TSTF-449, Rev. 4. The NRC approved Amendment 65 via letter dated November 3, 2006, 'Watts Bar Nuclear Plant, Unit 1 - Issuance of Amendment Regarding Steam Generator Tube Integrity (TS-05-10) (TAC No. MC9271).' Revision 82 made the associated changes to the Unit 1 TS Bases. Developmental Revision A to the Unit 2 TS and TS Bases made the equivalent changes to the Unit 2 TS / TS Bases. Affected TS sections include the following: LEAKAGE definition in 1.1, LCO 3.4.13 (RCS Operational LEAKAGE), LCO 3.4.17 (SG Tube Integrity), 5.7.2.12 (Steam Generator (SG) Program), and 5.9.9 (Steam Generator Tube Inspection Report). Developmental Revision A of the Unit 2 TS was submitted to the NRC via letter dated March 4, 2009, 'Watts Bar Nuclear Plant (WBN) Unit 2 -

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			Operating License Application Update,' (ADAMS Accession number ML090700378)."
GL 06-002	Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power	CI 06	Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Complete the two unit baseline electrical calculations and implementing procedures. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 2006-002 on January 20, 2010. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 21, 2010 (ADAMS Accession No. ML093631061) (See Appendix HH)" Note that the correct date and ADAMS Accession No. are January 20, 2010, and ML100080768, respectively.
GL 06-003	Potentially Nonconforming Hemyc and MT Fire Barrier Configurations	CI 06	TVA does not rely on Hemyc or MT materials to protect electrical and instrumentation cables or equipment that provide safe shutdown capability during a postulated fire. Unit 2 Action: Addressed in CAP/SP. The Fire Protection Corrective Action Program will ensure Unit 2 conforms with NRC requirements and applicable guidelines. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 2006-003 on February 25, 2010. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed. NRC Letter dated February 25, 2010 (ADAMS Accession No. ML100470398)"

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
GL 07-001	Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients	C 08	Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Complete testing of four additional cables. REVISION 02 UPDATE: NRC issued the Safety Evaluation for Generic Letter 2007-001 on January 26, 2010. REVISION 04 UPDATE: NRC Inspection Report 391/2010-603 closed GL 2007-001. REVISION 06 UPDATE: The four additional cables passed the testing. SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 26, 2010 (ADAMS Accession No. ML100120052)". REVISION 08 UPDATE: Status was changed from "CI" to "C."
GL 08-001	Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems	CO 07	Initial response for Unit 2 on October 1, 2008. REVISION 02 UPDATE: Unit 2 Actions: - TVA will provide a submittal within 45 days of completion of the engineering for the ECCS, RHR, and CSS systems. - WBN Unit 2 will complete the required modifications and provide a submittal consistent with the information requested in the GL 90 days prior to fuel load. REVISION 06 UPDATE: The submittal was provided in TVA to NRC letter dated March 11, 2011.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			This submittal satisfied the above Unit 2 actions and generated the following new commitments: - TVA will evaluate adopting the revised ISTS SR 3.5.2.3 (NUREG 1431) at WBN within 6 months of NRC approval of the Traveler. - Complete evaluation of CS pump 2A-A pipe chase horizontal suction piping for venting. Add a vent valve to this location or conduct periodic UT examinations if necessary. (90 days prior to fuel load.) - Add vent valves to selected locations in the ECCS and RHRS piping to enhance filling and venting. (90 days prior to fuel load.) - Complete walk down survey of ECCS and RHRS piping and evaluate the piping for latent voids that could exceed 5% of the pipe cross sectional area. (90 days prior to fuel load.) - Operating procedures are being revised to improve instructions for filling and venting portions of the ECCS discharge pipe. (90 days prior to fuel load.) - Complete Preoperational tests on ECCS and RHRS systems to confirm Unit 1 operating experience showing no gas intrusion/accumulation issues. (90 days prior to fuel load.) - Periodic venting procedures used to meet SR 3.5.2.3 are being revised to require that, for an extended gas release, a report is entered into the Corrective Action Program. (90 days prior to fuel load.) REVISION 07 UPDATE: SSER24 contained the following for NRC Action: "Closed. NRC letter dated August 23, 2011 (ADAMS Accession No. ML112232205)."
NUREG-0737, I.A.1.1	Shift Technical Advisor	NA	Not applicable to WBN per SSER16.
NUREG-0737, I.A.1.2	Shift Supervisor Responsibilities	NA	Not applicable to WBN per SSER16.
NUREG-0737, I.A.1.3	Shift Manning	C	Closed in SSER16.
NUREG-0737, I.A.2.1	Immediate Upgrade of RO and SRO Training and Qualifications	C	Closed in SSER16.
NUREG-0737, I.A.2.3	Administration of Training Programs	C	Closed in SSER16.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, I.A.3.1	Revise Scope and Criteria for Licensing Exams	C	Closed in SSER16.
NUREG-0737, I.B.1.2	Independent Safety Engineering Group	OV 06	LICENSE CONDITION: Independent Safety Engineering Group (ISEG) (NUREG-0737, I.B.1.2) Resolved for Unit 1 only in SSER8. Unit 2 action: Implement the alternate ISEG that was approved for the rest of the TVA units including WBN Unit 1 by NRC on August 26, 1999. The function will be performed by the site engineering organizations. REVISION 06 UPDATE: By letter of March 2, 1999, TVA proposed to eliminate the ISEG function from the fleet-wide nuclear organization. NRC safety evaluation of August 26,1999 shows that the NRC accepted the elimination of the ISEG with alternate organizational responsibilities provided in TVA-NQA-PLN89A and TVA-NPOD89-A. By letter of August 26, 1999, TVA revised Topical Report TVA-NPOD89-A, Rev 8 to describe the alternate organizations responsible for the management and operation of TVA's nuclear projects that replaced the ISEG function. The developmental Unit 2 TS were modeled after the Unit 1 TS. There is no reference to the ISEG. The current revision of TVA-NQA-PLN89-A (24A1) was written to include Unit 2. The current revision of TVA-NPOD89-A (18) was written to include Unit 2.
NUREG-0737, I.C.1	Short Term Accident and Procedure Review	CI	NRC reviewed in Appendix EE of SSER16. Unit 2 Action: Implement upgraded Emergency Operating Procedures, including validation and training.
NUREG-0737, I.C.2	Shift and Relief Turnover Procedures	C	Closed in SSER16.
NUREG-0737, I.C.3	Shift Supervisor Responsibility	C	Closed in SSER16.
NUREG-0737, I.C.4	Control Room Access	C	Closed in SSER16.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, I.C.5	Feedback of Operating Experience	C	Closed in SSER16.
NUREG-0737, I.C.6	Verify Correct Performance of Operating Activities	C	Closed in SSER16.
NUREG-0737, I.C.7	NSSS Vendor Revision of Procedures	CI	IR 50-390/391 85-08 closed this item for Unit 1, and NRC also reviewed in Appendix EE of SSER16. Unit 2 Action: Revise power ascension and emergency procedures which were reviewed by Westinghouse.
NUREG-0737, I.C.8	Pilot Monitoring of Selected Emergency Procedures For Near Term Operating Licenses	CI	IR 50-390/391 85-08 closed this item for Unit 1, and NRC also reviewed in Appendix EE of SSER16. Unit 2 Action: Pilot monitor selected emergency procedures for NTOL.
NUREG-0737, I.D.1	Control Room Design Review	CI 06	NRC reviewed in SSER5, SSER6, SSER15, and Appendix EE of SSER16. Unit 2 Actions: * Complete the CRDR process. * Perform rewiring in accordance with ECN 5982. * Take advantage of the completed Human Engineering reviews to ensure appropriate configuration for Unit 2 control panels. See CRDR Special Program. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed in SSER22, Section 18.2"
NUREG-0737, I.D.2	Plant-Safety-Parameter-Display Console	CI	NRC reviewed in SSER5, SSER6, and 18.2.2 of SSER15. Unit 2 Action: Install SPDS and have it operational prior to start-up after the first refueling outage.
NUREG-0737, I.G.1	Training During Low-Power Testing	C	Closed in SSER16.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, II.B.1	Reactor Coolant Vent System	CI	LICENSE CONDITION: NUREG-0737, II.B.1, "Reactor Coolant System Vents" In the original SER, the NRC found TVA's commitment to install reactor coolant vents acceptable pending verification. This was completed for Unit 1 only in SSER5 (IR 390/84-37). Unit 2 Action: Verify installation of reactor coolant vents.
NUREG-0737, II.B.2	Plant Shielding	CI	NRC reviewed in Appendix EE of SSER16. Unit 2 Action: Complete Design Review of EQ of equipment for spaces/systems which may be used in post accident operations.
NUREG-0737, II.B.3	Post-Accident Sampling	C 07	NRC reviewed in 9.3.2 of SSER16. TVA submitted a TS improvement to eliminate requirements for the Post Accident Sampling System using the Consolidated Line Item Improvement Process in a letter dated October 31, 2001. Unit 2 Actions: Unit 2 Technical Specifications will eliminate requirements for the Post-Accident Sampling System. REVISION 02 UPDATE: Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. Rev. 0 of the Unit 1 TS contained 5.7.2.6, "Post Accident Sampling." Amendment 34 to the Unit 1 TS (approved by the NRC on January 14, 2002) deleted 5.7.2.6, "Post Accident Sampling." The markup for Unit 2 Developmental Revision A noted that Unit 2 had deleted 5.7.2.6, "Post Accident Sampling" also. REVISION 07 UPDATE: SSER24 contained the following for NRC Action: "Closed in SSER 24, Section 9.3.2."
NUREG-0737, II.B.4	Training for Mitigating Core Damage	C	Closed in SSER16.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, II.D.1	Relief and Safety Valve Test Requirements	CI	NRC reviewed in Technical Evaluation Report attached to Appendix EE of SSER15. Unit 2 Actions: 1) Testing of relief and safety valves; 2) Reanalysis of fluid transient loads for pressurizer relief and safety valve supports and any required modifications; 3) Modifications to pressurizer safety valves, PORVs, PORV block valves and associated piping; and 4) Change motor operated block valves.
NUREG-0737, II.D.3	Valve Position Indication	CI	The design was reviewed in the original 1982 SER and found acceptable pending confirmation of installation of the acoustic monitoring system. In SSER5 (IR 390/84-35), the staff closed the LICENSE CONDITION for Unit 1 only. Unit 2 Action: Verify installation of the acoustic monitoring system to PORV to indicate position.
NUREG-0737, II.E.1.1	Auxiliary Feedwater System Evaluation, Modifications	CI 08	Reviewed in Appendix EE of SSER16. Unit 2 Action: Perform Auxiliary Feedwater System analysis as it pertains to system failure and flow rate. REVISION 08 UPDATE: Analysis has been completed; no hardware modification is required.
NUREG-0737, II.E.1.2	Auxiliary Feedwater System Initiation and Flow	CI	NRC: IR 50-390/84-20 and 50-391/84-16; letters dated March 29, 1985, and October 31, 1995; SSER 16 Unit 2 Actions: * Complete procedures, and * qualification testing.
NUREG-0737, II.E.3.1	Emergency Power For Pressurizer Heaters	CI	NRC: letters dated March 29, 1985, and October 31, 1995; SSER 16 Reviewed in original 1982 SER. Unit 2 Action: Implement procedures and testing.
NUREG-0737, II.E.4.1	Dedicated Hydrogen Penetrations	C	NRC: IR 50-390/83-27 and 50-391/83-19; SER (NUREG-0847)

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, II.E.4.2	Containment Isolation Dependability	C 07	TVA: letters dated October 29, 1981, and February 25, 1985 NRC: letters dated March 29, 1985, July 12, 1990 and October 31, 1995; SSER 16. OUTSTANDING ISSUE for NRC to complete review of information provided by TVA to address Containment Purging During Normal Plant Operation LICENSE CONDITION: Containment isolation dependability In the original 1982 SER, NRC concluded that WBN met all the requirements of NUREG-0737, item II.E.4.2 except subsection (6) concerning containment purging during normal operation. In SSER3, the outstanding issue was closed and the LICENSE CONDITION was left open. NRC completed the review and issued a Technical Evaluation Report for both units on July 12, 1990. NRC concluded that the isolation valves can close against the buildup of pressure in the event of a design basis accident if the lower containment isolation valves are physically blocked to an opening angle of 50 degrees or less. (SSER5) Unit 2 Action: Reflect valve opening restriction in the Technical Specifications. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS Surveillance Requirement 3.6.3.7 requires verification that the valves are "blocked to restrict the valve from opening > 50 degrees." REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed NUREG-0737, II.E.4.2.
NUREG-0737, II.F.1.2.a.	Accident-Monitoring Instrumentation - Noble Gas	CI	Reviewed in SSER9. Unit 2 Actions: Install Noble gas, Iodine / particulate sampling, and Containment High Range Monitors. Unit 2 Action: Install Noble gas monitor for Unit 2.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, II.F.1.2.b.	Accident-Monitoring Instrumentation - Iodine/Particulate Sampling	CI	Reviewed in SSER9. Unit 2 Actions: Install Noble gas, Iodine / particulate sampling, and Containment High Range Monitors. ---------- Unit 2 Action: Install Iodine / particulate sampling monitor for Unit 2.
NUREG-0737, II.F.1.2.c.	Accident-Monitoring Instrumentation - Containment High Range Monitoring	CI	Reviewed in SSER9. Unit 2 Actions: Install Noble gas, Iodine / particulate sampling, and Containment High Range Monitors. ---------- Unit 2 Action: Install high range in-containment monitor for Unit 2.
NUREG-0737, II.F.1.2.d.	Accident-Monitoring Instrumentation - Containment Pressure	CO 06	Reviewed in SSER9. Unit 2 Action: Verify installation of containment pressure indication. ---------- ---------- REVISION 06 UPDATE: NRC Inspection Report 391/2011-604 closed NUREG-0737, II.F.1.2.d.
NUREG-0737, II.F.1.2.e.	Accident-Monitoring Instrumentation - Containment Water Level	CO 07	Reviewed in SSER9. Unit 2 Action: Verify installation of containment water level monitors. ---------- ---------- REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed
NUREG-0737, II.F.1.2.f.	Accident-Monitoring Instrumentation - Containment Hydrogen	CO 06	Reviewed in SSER9. Unit 2 Action: Verify installation of containment hydrogen accident monitoring instrumentation. ---------- ---------- REVISION 06 UPDATE: NRC Inspection Report 391/2011-604 closed NUREG-0737, II.F.1.2.F.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, II.F.2	Instrumentation For Detection of Inadequate Core-Cooling	O 07	LICENSE CONDITION: Detectors for Inadequate core cooling (II.F.2) In the original SER, the review of the ICC instrumentation was incomplete. The January 24, 1992, letter superseded the previous responses on this issue. TVA letter for Units 1 and 2 dated January 24, 1992, committed to install Westinghouse ICCM-86 and associated hardware. NRC completed the review for Units 1 and 2 in SSER10. For Unit 2 due to obsolescence of the ICCM-86 system, TVA intends to install the Westinghouse Common Q Post-Accident Monitoring System. Unit 2 Action: Install Westinghouse Common Q PAM system. REVISION 07 UPDATE: Page 1-38 of SSER23 provided the following as NRC Action for this item: "Open. See SSER23, Section 4.4.8." Section 4.4.8 ends with: "The NRC staff should complete its review and evaluation of the additional information provided by TVA regarding the ICC instrumentation. This is Open Item 72 (Appendix HH)." Open Item 72 (Appendix HH) reads as follows: "The NRC staff should complete its review and evaluation of the additional information provided by TVA regarding the ICC instrumentation. (Section 4.4.8)" NRC Inspection Report 391/2011-608 closed NUREG-0737, II.F.2
NUREG-0737, II.G.1	Power Supplies For Pressurizer Relief Valves, Block Valves and Level Indicators	CI 06	Reviewed in original 1982 SER and 8.3.3 of SSER7. Unit 2 Action: Implement modifications such that PORVS and associated Block Valves are powered from same train but different buses. REVISION 06 UPDATE: Modifications were implemented such that PORVS and associated Block Valves are powered from same train but different buses.
NUREG-0737, II.K.1.5	Review ESF Valves	C 08	NRC: letter dated March 29, 1985; SSER 16 REVISION 08 UPDATE: NRC Inspection Report 391/2012-603 closed this item.

* = See last page for status code definition.

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, II.K.1.10	Operability Status	CI	Unit 2 Action: Confirm multi-unit operation will have no impact on administrative procedures with respect to operability status.
NUREG-0737, II.K.1.17	Trip Per Low-Level B/S	C	NRC: letter dated March 29, 1985; SSER 16
NUREG-0737, II.K.2.13	Effect of High Pressure Injection for Small Break LOCA With No Auxiliary Feedwater	C	LICENSE CONDITION: Effect of high pressure injection for small break LOCA with no auxiliary feedwater (NUREG-0737, II.K.2.13) In SSER4, the staff concluded that there was reasonable assurance that vessel integrity would be maintained for small breaks with an extended loss of all feedwater and that the USI A-49, "Pressurized Thermal Shock," review did not have to be completed to support the full-power license. They considered this condition resolved.
NUREG-0737, II.K.2.17	Voiding in the Reactor Coolant System	C	LICENSE CONDITION: Voiding in the reactor coolant system (NUREG-0737, II.K.2.17) The staff reviewed the generic resolution of this license condition in SSER4 and approved the study in question, thereby resolving this license condition.
NUREG-0737, II.K.3.1	Auto PORV Isolation	C	Reviewed in SSER5 and resolved based on NRC conclusion that there is no need for an automatic PORV isolation system (NRC letter dated June 29, 1990).
NUREG-0737, II.K.3.2	Report on PORV Failures	C	Reviewed in SSER5 and resolved based on NRC conclusion that there is no need for an automatic PORV isolation system (NRC letter dated June 29, 1990).
NUREG-0737, II.K.3.3	Reporting SV/RV Failures/Challenges	C 06	(Action from GL 82-16) – NRC reviewed in Appendix EE of SSER16. Unit 2 Action: Include, as necessary, in Technical Specifications submittal. REVISION 02 UPDATE: Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. Rev. 0 of the Unit 1 TS contained 5.9.4 (Monthly Operating Reports) which implemented the above commitment for Unit 1. Amendment 57 to the Unit 1 TS (approved by the NRC on March 21, 2005) deleted this section of the TS. The markup for Unit 2 Developmental Revision A noted that Unit 2 will apply this change, and the Unit 2 TS will contain no requirement for Monthly Operating Reports.

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed in SSER22, Section 13.5.3."
NUREG-0737, II.K.3.5	Auto Trip of RCPS	CI	Reviewed in 15.5.4 of original 1982 SER; became License Condition 35. The staff determined that their review of Item II.K.3.5 did not have to be completed to support the full power license and considered this license condition resolved in SSER4. The item was further reviewed in Appendix EE of SSER16. Unit 2 Action: Implement modifications as required.
NUREG-0737, II.K.3.9	PID Controller	C 07	Reviewed in original 1982 SER. Unit 2 Action: Set the derivative time constant to zero. REVISION 06 UPDATE: The derivative time constant was set to zero. REVISION 07 UPDATE: NRC Inspection Report 391/2011-605 closed NUREG-0737, II.K.3.9.
NUREG-0737, II.K.3.10	Anticipatory Trip at High Power	S 02	NRC: letter dated October 31, 1995; SSER 16 Unit 2 Action: Unit 2 Technical Specifications and surveillance procedures will address this issue. REVISION 02 UPDATE: Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009. Items 14.a. (Turbine Trip - Low Fluid Oil Pressure) and 14.b. (Turbine Trip - Turbine Stop Valve Closure) of TS Table 3.3.1-1 are the trips of interest. The table and the Bases for these items state that below the P-9 setpoint, these trips do not actuate a reactor trip. Per item 16.d. (Power Range Neutron Flux, P-9) of TS Table 3.3.1-1, the Nominal Trip Setpoint for P-9 is "50% RTP" and the Allowable Value is "< 52.4% RTP."

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, II.K.3.12	Confirm Existence of Anticipatory Reactor Trip Upon Turbine Trip	C	Closed in SSER16.
NUREG-0737, II.K.3.17	Report On Outage of Emergency Core Cooling System	C 08	LICENSE CONDITION: Report on outage of emergency core cooling system (NUREG-0737, II.K.3.17) In the original 1982 SER, the NRC accepted TVA's commitment to develop and implement a plan to collect emergency core cooling system outage information. In SSER3, the staff accepted a revised commitment from an October 28, 1983, letter to participate in the nuclear power reliability data system and comply with the requirements of 10 CFR 50.73. REVISION 08 UPDATE: NRC Inspection Report 391/2012-603 closed this item.
NUREG-0737, II.K.3.25	Power On Pump Seals	C 06	NRC reviewed and closed in IR 390/84-35 based on Diesel Generator (DG) power to pump sealing cooling system. Unit 2 Action: Ensure DG power is provided to pump sealing cooling system. REVISION 06 UPDATE: It was confirmed that DG power is provided to pump sealing cooling system. NRC Inspection Report 391/2010-605 closed NUREG-0737, II.K.3.25.
NUREG-0737, II.K.3.30	Small Break LOCA Methods	C 06	TVA: letter dated October 29, 1981 NRC: letters dated March 29, 1985, and July 24, 1986; SSER 16 The staff determined in SSER4 that their review of Items II.K.3.30 and II.K.3.31 did not have to be completed to support the full-power license and considered this LICENSE CONDITION resolved in SSER4. In SSER5, the staff further reviewed responses to these items, and concluded that the Units 1 and 2 FSAR methods and analysis met the requirements of II.K.3.30 and II.K.3.31. This item was further reviewed in Appendix EE of SSER16. Unit 2 Action: Complete analysis for Unit 2.

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			REVISION 06 UPDATE: The analysis has been completed for Unit 2. ---------- NRC Inspection Report 391/2011-603 closed NUREG-0737, II.K.3.30.
NUREG-0737, II.K.3.31	Plant Specific Analysis	C 06	The staff determined in SSER4 that their review of Items II.K.3.30 and II.K.3.31 did not have to be completed to support the full-power license and considered this LICENSE CONDITION resolved in SSER4. In SSER5, the staff further reviewed responses to these items, and concluded that the Units 1 and 2 FSAR methods and analysis met the requirements of II.K.3.30 and II.K.3.31. This item was further reviewed in Appendix EE of SSER16. Unit 2 Action: Complete analysis for Unit 2. ---------- ---------- REVISION 06 UPDATE: The analysis has been completed for Unit 2. ---------- NRC Inspection Report 391/2011-603 closed NUREG-0737, II.K.3.31.
NUREG-0737, III.A.1.1	Emergency Preparedness, Short Term	C	LICENSE CONDITION: Emergency Preparedness (NUREG-0737, III.A.1, III.A.2) The NRC review of Emergency Preparedness in SSER13 superseded the review in the original 1982 SER. In SSER13, the staff concluded that the WBN Radiological Emergency Plan (REP) provided an adequate planning basis for an acceptable state of onsite emergency preparedness, and the LICENSE CONDITION was deleted. The NRC completed the review of the REP in SSER20.
NUREG-0737, III.A.1.2	Upgrade Emergency Support Facilities	C	LICENSE CONDITION: Emergency Preparedness (NUREG-0737, III.A.1, III.A.2) The NRC review of Emergency Preparedness in SSER13 superseded the review in the original 1982 SER. In SSER13, the staff concluded that the WBN Radiological Emergency Plan (REP) provided an adequate planning basis for an acceptable state of onsite emergency preparedness, and the LICENSE CONDITION was deleted. The NRC completed the review of the REP in SSER20.

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, III.A.2	Emergency Preparedness	C	LICENSE CONDITION: Emergency Preparedness (NUREG-0737, III.A.1, III.A.2) The NRC review of Emergency Preparedness in SSER13 superseded the review in the original 1982 SER. In SSER13, the staff concluded that the WBN Radiological Emergency Plan (REP) provided an adequate planning basis for an acceptable state of onsite emergency preparedness, and the LICENSE CONDITION was deleted. The NRC completed the review of the REP in SSER20.
NUREG-0737, III.D.1.1	Primary Coolant Outside Containment	S 02	Resolved for Unit 1 only in SSER10; reviewed in Appendix EE of SSER16. Unit 2 Actions: Include the waste gas disposal system in the leakage reduction program and incorporate in Unit 2 Technical Specifications. REVISION 02 UPDATE: Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010. TS 5.7.2.4 is the Primary Coolant Sources Outside Containment program. This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. This program includes the "Waste Gas" system.
NUREG-0737, III.D.3.3	In-Plant Iodine Radiation Monitoring	C 08	NRC reviewed in Appendix EE of SSER16. Unit 2 Action: Complete modifications for Unit 2. REVISION 08 UPDATE: Unit 2's planned response to Item III.D.3.3 as documented originally in regulatory framework letter (TVA to NRC) dated January 29, 2008, and the latest letter dated December 20, 2011, was to "complete modifications for Unit 2." However since all of the accident monitoring equipment for Unit 2 will be similar to, if not the same, portable equipment that is presently in service for Unit 1, no design changes / modifications are required. NRC Inspection Report 391/2012-605 closed this item.

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
NUREG-0737, III.D.3.4	Control-Room Habitability	C 08	TVA: letter dated October 29, 1981 NRC: SSER 16 ---------- NRC reviewed in SER and in Appendix EE of SSER16. Unit 2 Action: Complete with CRDR completion. ---------- ---------- REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed in SSER22, Section 6.4" ---------- ---------- REVISION 08 UPDATE: All required actions have been completed. Dose calculations that demonstrate that the control room remains habitable have been revised and issued for Unit 2.

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION

STATUS CODE DEFINITIONS

C: CLOSED: Previous staff review of NUREG-0847 and/or supplements has closed the item either for both units at WBN or explicitly for WBN Unit 2.

CI: CLOSED/IMPLEMENTATION: Staff has approved either for both units at WBN or explicitly for WBN Unit 2; there is no change to the approved design; and implementation is recommended through Regional Inspection.

CO: CLOSED - OPEN: Staff has approved closure of the item; however, TVA actions remain to be completed.

CT: CLOSED/TECHNICAL SPECIFICATIONS: Item has been approved either for both units at WBN or explicitly for WBN Unit 2; however, a change to the original approval requires submittal of the Technical Specifications and staff review.

NA: NOT APPLICABLE: Justification as to why a section / subsection is not applicable is provided in the ADDITIONAL INFORMATION column.

O: OPEN: No action or documentation is provided that shows the staff has reviewed the item for WBN Unit 2.

OT: OPEN/TECHNICAL SPECIFICATIONS: No action or documentation is provided that shows the staff has reviewed the item for WBN Unit 2, and the resolution is through submittal of a Technical Specification.

OV: OPEN/VALIDATION: The proposed approach has been approved for Watts Bar Unit 1; the same approach is proposed for use on WBN Unit 2 without change.

S: SUBMITTED: Information has been submitted, and is under review by NRC staff.

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Enclosure 4

Generic Communications - Revision 8 Changes

GENERIC COMMUNICATIONS: REVISION 8 CHANGES

ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 75-003	Incorrect Lower Disc Spring and Clearance Dimension in Series 8300 and 8302 ASCO Solenoid Valves	CO --. 08	TVA: letter dated May 16, 1975 NRC: IR 390/391 75-6 ---------- NRC accepted in IR 50-390/75-6 and 50-391/75-6 (August 21, 1975). Unit 2 Action: Modify valves not modified at factory. ---------- ---------- REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
B 75-005	Operability of Category I Hydraulic Shock and Sway Suppressors	CO --. 08	TVA: letter dated June 16, 1975 NRC: IR 390/391 75-6 ---------- NRC accepted in IR 50-390/75-6 and 50-391/75-6 (August 21, 1975). Unit 2 Action: Install proper suppressors. ---------- ---------- REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
B 78-004	Environmental Qualification of Certain Stem Mounted Limit Switches Inside Reactor Containment	C --. 08	TVA: letter dated December 19, 1978 NRC: IR 390/82-13 and 391/82-10 Closed to EQ Program ---------- IR 50-390/82-13 and 50-391/82-10 (April 22, 1982) accepted approach. Unit 2 Action: Ensure NAMCO switches have been replaced. ---------- ---------- REVISION 08 UPDATE: The NAMCO switches were replaced. NRC Inspection Report 391/2012-605 closed this item.

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
B 80-011	Masonry Wall Design	CI 08	NRC accepted all but completion of corrective actions in IR 50-390/93-01 and 50-391/93-01(February 25, 1993) and closed for Unit 1 in IR 50-390/95-46 (August 1, 1995). Unit 2 Action: Complete implementation for Unit 2. REVISION 08 UPDATE: NRC Inspection Report 391/2011-610 closed this item.
B 80-020	Failure of Westinghouse Type W-2 Spring Return to Neutral Control Switches	C 08	Unit 2 Action: Modify switches. REVISION 06 UPDATE: The switches were modified. NRC Inspection Report 391/2011-604 closed B 80-020. REVISION 08 UPDATE: Changed status from "CI" to "C."
B 83-006	Nonconforming Material Supplied by Tube-Line Facilities	C 08	TVA: letter dated February 2, 1984 NRC: IR 390/391 84-03; NUREG/CR 4934 NRC SER for both units dated September 23, 1991, provided an alternate acceptance for fittings supplied by Tube-Line. Unit 2 Action: Implement as necessary. REVISION 04 UPDATE: NRC Inspection Report Nos. 50-390/90-02 and 50-391/90-02 found the proposed alternative to ASME code paragraph NA-3451 (a) to be acceptable. It noted that TVA must revise the FSAR to document this deviation from ASME Section III requirements. TVA letter to NRC dated October 11, 2007, stated the Unit 1 exemption is applicable to Unit 2 and was submitted to the NRC as being required for Unit 2 construction. Final action was to incorporate the exemption in the Unit 2 FSAR. This exemption is documented in Unit 2 FSAR Section 3.2 in paragraph 3.2.3.2 and Table 3.2-2a as explained in Note 4. of the table.

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			REVISION 08 UPDATE: NRC Inspection Report 391/2012-603 closed this item.
B 88-004	Potential Safety-Related Pump Loss	CI 08	NRC acceptance letter dated May 24, 1990, for both units. Unit 2 Actions: * Perform calculations, and * install check valves to prevent pump to pump interaction. REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
B 88-008	Thermal Stresses in Piping Connected to Reactor Cooling Systems	CI 08	NRC acceptance letter dated September 19, 1991 (both units). NRC acceptance letter dated June 26, 1995 (Unit 1). Unit 2 Action: * Implement program to prevent thermal stratification. * Submit a letter to NRC that confirms actions are complete for WBN Unit 2 within 30 days of completion of the modifications.
B 88-010	Nonconforming Molded-Case Circuit Breakers	C 08	Unit 2 Action: Replace those circuits not traceable to a circuit breaker manufacturer. REVISION 07 UPDATE: All Unit 2 safety-related molded case circuit breakers were replaced with new qualified breakers procured from the original equipment manufacturers. REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
GL 88-020	Individual Plant Examination for Severe Accident Vulnerabilities	C 08	Unit 2 Action: Complete evaluation for Unit 2. REVISION 02 UPDATE: The Probabilistic Risk Assessment Individual Plant Examination Summary

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			Report was submitted on February 9, 2010. REVISION 04 UPDATE: The Individual Plant Examination of External Events Design Report was submitted on April 30, 2010. REVISION 06 UPDATE: The NRC issued Requests for Additional Information (RAIs) on November 12, 2010. TVA responded to the RAIs on December 17, 2010, and April 1, 2011. REVISION 07 UPDATE: SSER24 contained the following for NRC Action for GL 88-020 through Supplement 3: "Closed. NRC letter dated August 12, 2011 (ADAMS Accession No. ML111960228)." REVISION 08 UPDATE: SSER25 contained the following for NRC Action for GL 88-020, Supplements 4 and 5: "Closed. NRC letter dated September 20, 2011 (ADAMS Accession No. ML111960300)."
GL 89-002	Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products	C 08	GL 89-02 did not require a response. WBN Unit 2 program for procurement and dedication of materials is based in part on and complies with the guidance of GL 89-02. The program is implemented through project procedures. REVISION 08 UPDATE: NRC Inspection Report 391/2012-604 closed this item.
GL 95-007	Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves	CO 08	Unit 1 SER for GL 95-07 dated Sept 15, 1999 Unit 2 Actions: * Perform evaluation for pressure locking and thermal binding of safety related power-operated gate valves, and

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			* take corrective actions for those valves identified as being susceptible. REVISION 03 UPDATE: April 1, 2010, letter committed to evaluate missing GL 89-10 motor-operated valves for susceptibility to pressure locking and thermal binding. REVISION 04 UPDATE: NRC letter dated July 29, 2010, provided RAIs on the GL. TVA letter dated July 30, 2010, answered the RAIs and provided the following commitments: * EDCRs 53292 and 53287 shall be implemented to eliminate the potential for pressure locking prior to startup. * Valves 2-FCV-63-25 and -26 will be evaluated for impact due to new parameters from the JOG Topical Report MPR 2524A prior to startup. NRC issued the Safety Evaluation for GL 1995-007 on August 12, 2010. REVISION 06 UPDATE: TVA letter to NRC dated July 30, 2010, documented that none of the missing Watts Bar Unit 2 GL 89-10 valves are GL 95-07 valves. SSER22 contained the following for NRC Action: "Closed. NRC Letter dated August 12, 2010 (ADAMS Accession No. ML100190443)" REVISION 08 UPDATE: NRC Inspection Report 391/2012-602 closed this item.
GL 07-001	Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients	C 08	Initial response for Unit 2 on September 7, 2007. Unit 2 Action: Complete testing of four additional cables. REVISION 02 UPDATE:

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ITEM	TITLE	* REV	ADDITIONAL INFORMATION
			NRC issued the Safety Evaluation for Generic Letter 2007-001 on January 26, 2010. REVISION 04 UPDATE: NRC Inspection Report 391/2010-603 closed GL 2007-001. REVISION 06 UPDATE: The four additional cables passed the testing. SSER22 contained the following for NRC Action: "Closed. NRC Letter dated January 26, 2010 (ADAMS Accession No. ML100120052)" REVISION 08 UPDATE: Status was changed from "CI" to "C."
NUREG-0737, II.E.1.1	Auxiliary Feedwater System Evaluation, Modifications	CI 08	Reviewed in Appendix EE of SSER16. Unit 2 Action: Perform Auxiliary Feedwater System analysis as it pertains to system failure and flow rate. REVISION 08 UPDATE: Analysis has been completed; no hardware modification is required.
NUREG-0737, II.K.1.5	Review ESF Valves	C 08	NRC: letter dated March 29, 1985; SSER 16 REVISION 08 UPDATE: NRC Inspection Report 391/2012-603 closed this item.
NUREG-0737, II.K.3.17	Report On Outage of Emergency Core Cooling System	C 08	LICENSE CONDITION: Report on outage of emergency core cooling system (NUREG-0737, II.K.3.17) In the original 1982 SER, the NRC accepted TVA's commitment to develop and implement a plan to collect emergency core cooling system outage information. In SSER3, the staff accepted a revised commitment from an October 28, 1983, letter to participate in the nuclear power reliability data system and comply with the requirements of 10 CFR 50.73.

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			REVISION 08 UPDATE: NRC Inspection Report 391/2012-603 closed this item.
NUREG-0737, III.D.3.3	In-Plant Iodine Radiation Monitoring	C 08	NRC reviewed in Appendix EE of SSER16. Unit 2 Action: Complete modifications for Unit 2. REVISION 08 UPDATE: Unit 2's planned response to Item III.D.3.3 as documented originally in regulatory framework letter (TVA to NRC) dated January 29, 2008, and the latest letter dated December 20, 2011, was to "complete modifications for Unit 2." However since all of the accident monitoring equipment for Unit 2 will be similar to, if not the same, portable equipment that is presently in service for Unit 1, no design changes / modifications are required. NRC Inspection Report 391/2012-605 closed this item.
NUREG-0737, III.D.3.4	Control-Room Habitability	C 08	TVA: letter dated October 29, 1981 NRC: SSER 16 NRC reviewed in SER and in Appendix EE of SSER16. Unit 2 Action: Complete with CRDR completion. REVISION 06 UPDATE: SSER22 contained the following for NRC Action: "Closed in SSER22, Section 6.4" REVISION 08 UPDATE: All required actions have been completed. Dose calculations that demonstrate that the control room remains habitable have been revised and issued for Unit 2.

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