

Enclosure 2

SER and Supplements Review Matrix - Revision 6 Changes

SAFETY EVALUATION REPORT AND SUPPLEMENTS (NUREG-0847) REVIEW MATRIX: REVISION 6 CHANGES

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
2.1.0	22	C	Approved for both units in SER.
		06	REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
2.1.1	22	C	Approved for both units in SER.
		06	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	Approved for both units in SER.
		06	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."
2.1.3	22	C	SRP requirement.
		06	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).

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>Amendment 94 to the Unit 2 FSAR was submitted on August 27, 2009.</p> <p>Part of this amendment revised population information in Section 2.1.3.</p> <p>REVISION 06 UPDATE:</p> <p>SSER22 shows the status for this item as "Resolved."</p>
2.1.4	22	C 06	<p>"CONCLUSIONS" left open until all items in subsection are closed.</p> <p>REVISION 06 UPDATE:</p> <p>SSER22 shows the status for this item as "Resolved."</p>
2.2.0	22	C 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>SSER22 shows the status for this item as "Resolved."</p>
2.2.1	22	C 06	<p>SRP requirement.</p> <p>Unit 2 Action: Update FSAR for potential external hazards and hazardous materials.</p> <p>REVISION 02 UPDATE:</p> <p>Status in SSER21 is Open (NRR).</p> <p>Amendment 94 to the Unit 2 FSAR was submitted on August 27, 2009.</p> <p>Part of this amendment revised the description of hazardous material shipped past the plant in Section 2.2.2.2.</p> <p>REVISION 06 UPDATE:</p> <p>SSER22 shows the status for this item as "Resolved."</p>

SER SECTION	SSER #	* --- REV.		ADDITIONAL INFORMATION
2.2.2	22	C		SRP requirement.
		06		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		"CONCLUSIONS" left open until all items in subsection are closed.
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				REVISION 06 UPDATE:
				SSER22 shows the status for this item as "Resolved."

2.3.1	22	C		Approved for both units in SER.
		06		-----

				REVISION 06 UPDATE:
				2.3.1 of SSER22 included:
				"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.
				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."

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
2.3.2	22	C ----- 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>2.3.2 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
2.3.3	22	C ----- 06	<p>See 13.3.3 (Emergency Preparedness Evaluation Conclusions).</p> <p>REVISION 06 UPDATE:</p> <p>2.3.3 of SSER22 included:</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
2.3.4	22	C ----- 06	<p>TVA updated information on portions of the metrology program in FSAR amendment 83. This was reviewed and found acceptable in SSER14.</p> <p>REVISION 06 UPDATE:</p> <p>2.3.4 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>

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2.4.9	22	C		SRP requirement.
		06		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 included:
				"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."

2.6.0	22	C		Approved for both units in SER.
		06		-----
				REVISION 06 UPDATE:
				Section 2.6 of SSER22 included:
				"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."

3.5.1	22	C		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.
		06		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 included:
				"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

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			<p>every 6 months for turbine valves is acceptable, and the open item is closed."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
3.5.2	22	C ----- 06	<p>CONFIRMATORY ISSUE for modifications to protect Diesel Generators</p> <p>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.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 3.5.2 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
3.6.1	22	C ----- 06	<p>OUTSTANDING ISSUE involving main steam line break (MSLB) outside containment</p> <p>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.</p> <hr/> <p>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.</p> <hr/> <p>REVISION 02 UPDATE:</p> <p>Status in SSER21 is Open (NRR).</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>3.6.1 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>

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3.6.2	22	C ----- 06	<p>The 3.6.2 discussion in SSER14 on response spectra for the SCV refers to the evaluation provided in 3.6.1.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Page 1-5 of SSER22 has "3" in the "Note" column for this item.</p> <p>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."</p> <p>Section 3.6.2 of SSER22 included:</p> <p>"Therefore, the staff finds TVA's changes and modifications to Section 3.6B.2 of FSAR Amendment 95 to be acceptable."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
3.6.3	22	O ----- 06	<p>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.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 3.6.3 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p>
3.7.3	22	C ----- 06	<p>OUTSTANDING ISSUE involving number of peak cycles to be used for OBE</p> <p>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.</p> <hr/> <p>OUTSTANDING ISSUE involving use of code cases, damping factors for conduit and use of worst case, critical case and bounding case</p> <p>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.</p> <p>Unit 2 Action: Addressed in CAP/SP. The Unit 1 approach will be used for Unit 2.</p> <hr/> <p>OUTSTANDING ISSUE involving 1.2 multi mode factor</p>

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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 included:

"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."

SSER22 shows the status for this item as "Resolved."

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
3.9.1	22	CO ----- 06	<p>OUTSTANDING ISSUE involving assumption in piping analysis for water-hammer due to check valve slam</p> <p>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.</p> <p>Unit 2 Action: Modify supports as needed.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>3.9.1 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
3.9.2	22	C ----- 06	<p>The staff reviewed "Pre-operational Vibration and Dynamic Effects Testing on Piping", and found this area acceptable in SSER14.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>3.9.2 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
3.9.3	22	C ----- 06	<p>3.9.3.1: OUTSTANDING ISSUE involving use of experience data to qualify category I(L) piping</p> <p>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.</p> <p>-----</p> <p>3.9.3.3: LICENSE CONDITION - Relief and safety valve testing (II.D.1)</p> <p>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.</p> <p>-----</p> <p>3.9.3.3: OUTSTANDING ISSUE involving operating characteristics of main steam safety valves</p> <p>The staff identified a concern with operating characteristics of main steam safety valves in SSER6. In a</p>

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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
			<p>REVISION 06 UPDATE:</p> <p>Section 3.9.3 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
3.9.6	22	O ----- 06	<p>LICENSE CONDITION on inservice testing of pumps and valves</p> <p>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.</p> <p>-----</p> <p>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.</p> <p>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.</p> <p>Unit 2 Action: Submit Technical Specifications.</p> <p>-----</p> <p>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.</p> <p>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.</p> <p>-----</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009.</p> <p>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.</p> <p>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.</p> <p>TS 5.7.2.11 provides the Inservice Testing Program.</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 3.9.6 of SSER22 included:</p> <p>"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</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>supplement to the SER before it issues an OL for WBN Unit 2."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p>
3.11.0	22	CI ----- 06	<p>OUTSTANDING ISSUE - TVA program not submitted at time of SER</p> <p>The EQ program was submitted after issuance of the SER. It was reviewed and found acceptable in SSER15.</p> <p>Unit 2 Action: Complete EQ Special Program.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the EQ SP.</p> <p>In SSER21, the Environmental Qualification Special Program was resolved. The EQ program is tracked under 23.3.4.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>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."</p> <p>The following Open Items of Appendix HH are applicable to this item: 16, 17, 18, 19, 20, 21, 22, 23, and 24.</p> <p>SSER22 shows the status for this item as "OPEN (NRR)."</p> <p>-----</p> <p>Per TVA letter to NRC dated April 6, 2011, the action for Open Item 16 is for NRC Inspection / Review.</p> <p>-----</p> <p>Per TVA letter to NRC dated April 6, 2011, the action for Open Item 17 is for NRC Inspection / Review.</p> <p>-----</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 18:</p> <p>"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)."</p> <p>-----</p> <p>TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 19:</p> <p>"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."</p> <p>-----</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 20:</p> <p>"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.</p> <p>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."</p> <p>-----</p> <p>TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 21:</p> <p>"The closure package has been provided to the WBN Unit 2 Resident Inspectors."</p> <p>-----</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 22:</p> <p>"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.</p> <p>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."</p> <p>-----</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 23:</p> <p>"TVA will qualify the MSIV solenoids to the Category I criteria."</p> <p>-----</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 24:</p> <p>"Calculation 'A Review of Electronic Components in a Radiation Environment of $\leq 5 \times 10^4$ RADS' is provided as Attachment 2."</p> <p>[Since ACCESS does not use exponents, it is clarified that "$\leq 5 \times 10^4$" is equal to "$\leq 5 \times 10^4$."]</p> <p>-----</p> <p>NRC Inspection Report 391/2011-604 closed Open SSER22 (Appendix HH) Open Items 18 and 19.</p>
3.13.0	22	C	Area not addressed in 1981 Standard Review Plan.
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			<p>REVISION 06 UPDATE:</p> <p>Section 3.13 of SER22 was as follows:</p> <p>"3.13 Threaded Fasteners</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
5.2.1	22	C ----- 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 5.2.1.4 of SSER22 included:</p> <p>"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 (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:</p> <p>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.</p> <p>TVA's response is acceptable to the staff."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
5.2.3	22	C ----- 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 5.2.3 of SSER22 included the following:</p> <p>"SRP Section 5.2.3 contains the relevant NRC regulatory requirements for this area of review and the associated acceptance criteria."</p> <p>"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 stainless steels, the NRC staff finds the use of this ASME Code case acceptable.</p> <p>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."</p>

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			<p>"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."</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
5.2.5	22	C ----- 06	<p>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.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>In SSER21 the status is Open (NRR).</p> <p>-----</p> <p>REVISION06 UPDATE:</p> <p>Section 5.2.5 of SSER22 included the following:</p> <p>"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.</p> <p>The systems meet the requirements of GDC 30 with respect to RCPB leakage detection and 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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
5.3.1	22	S ----- 06	<p>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.</p> <p>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.</p> <p>-----</p>

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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 RTPPTS 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

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			<p>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.</p> <p>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."</p>
5.3.2	22	S 06	<p>OUTSTANDING ISSUE - P-T limits for Unit 2 not provided. Staff will review as part of Unit 2 Technical Specifications.</p> <p>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.</p> <p>Unit 2 action: Submit P-T limits.</p> <hr/> <p>REVISION 02 UPDATE:</p> <p>Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010.</p> <p>WCAP-17035-NP "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation" was submitted with the TS.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>The Conclusions portion of Section 5.3.2 in SSER22 states:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <hr/> <p>TVA to NRC letter dated April 6, 2011 provided the following responses to Open Items 44, 45, and 46:</p> <p>Open Item 44:</p> <p>"This response clarifies how the initial and irradiated RTNDT values were determined for the Watts Bar</p>

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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

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			(Watts Bar Unit 2 PORV Setpoints vs Temperature) contains the lift settings."
5.3.3	22	S	OUTSTANDING ISSUE for staff to complete evaluation of Unit 2 after receipt of P-T limits
		06	<p>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.</p> <p>Unit 2 action: Submit P-T limits.</p> <p>REVISION 02 UPDATE:</p> <p>Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010.</p> <p>WCAP-17035-NP "Watts Bar Unit 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation" was submitted with the TS.</p> <p>REVISION 06 UPDATE:</p> <p>Section 5.3.3 in SSER22 included:</p> <p>"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.</p> <p>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 ..."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>TVA to NRC letter dated April 6, 2011 provided the following responses to Open Items 44, 45, and 46:</p> <p>Open Item 44:</p> <p>"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</p>

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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."

5.4.1	22	C	Approved for both units in SER.
		06	

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

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			<p>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."</p> <p>Section 5.4.1.1 of SSER22 notes that Amendment 97 to the Unit 2 FSAR was the one reviewed for this section.</p> <p>SSER22 shows the status for this item as "Resolved."</p>
5.4.2	22	C 06	<p>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</p> <p>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.</p> <p>REVISION 06 UPDATE:</p> <p>Section 5.4.2.1 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
5.4.4	22	C 06	<p>Approved for both units in SER.</p> <p>REVISION UPDATE:</p> <p>Section 5.4.4 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>

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6.1.2	22	C 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 6.1.2 of SSER22 included:</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.1.3	22	C 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 6.1.3 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.2.1	22	O 06	<p>6.2.1.1: CONFIRMATORY ISSUE involves reviewing analysis that ensures that containment external pressure will not exceed design value of 2.0 psi</p> <p>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.</p> <hr/> <p>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).</p> <p>In SSER7, the staff resolved their concerns regarding local temperatures near MSLBs inside containment and their impact on equipment qualification.</p> <p>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.</p> <p>In SSER14, the staff reviewed revisions to a number of containment design parameters and concluded</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>that none affect conclusions reached in the SER or supplements.</p> <p>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.</p> <p>Unit 2 Action:</p> <p>Review Unit 2 Technical Specifications with respect to divider barrier seal surveillance program.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009.</p> <p>TS 3.6.13 provides the Limiting Condition for Operation for Divider Barrier Integrity.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 6.2.1 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.2.2	22	C ----- 06	<p>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.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the Containment Cooling Special Program .</p> <p>In SSER21, the Containment Cooling SP was resolved. Completion of the Containment Cooling SP is tracked under 23.3.2.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>Section 6.2.2 of SSER22 included:</p> <p>"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 system meets the relevant requirements of GDC 38, 39, and 40 and is consistent with the acceptance criteria in SRP Section 6.2.2."</p> <p>SSER22 shows the status for this item as "Resolved."</p> <p>-----</p> <p>NRC Inspection Report 391/2011-602 closed the Containment Cooling SP.</p>
6.2.3	22	C ----- 06	<p>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.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 6.2.3 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.2.4	22	O ----- 06	<p>CONFIRMATORY ISSUE to install safety grade isolation valves on 1" chemical feed lines joining feedwater lines to main steam line.</p> <p>LICENSE CONDITION – Modification of chemical feedlines</p> <p>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.</p> <p>-----</p> <p>OUTSTANDING ISSUE for NRC to complete review of information provided by TVA to address Containment Purging During Normal Plant Operation</p> <p>LICENSE CONDITION - Containment isolation dependability</p> <p>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)</p> <p>Unit 2 Action: Reflect valve opening restriction in the Technical Specifications.</p> <p>-----</p> <p>OUTSTANDING ISSUE involving containment isolation using closed systems</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (Inspection).</p> <p>Developmental Revision B of the Unit 2 Technical Specifications (TS) was submitted on February 2, 2010.</p> <p>TS Surveillance Requirement 3.6.3.7 requires verification that the valves are "blocked to restrict the valve from opening > 50 degrees."</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 6.2.4 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.2.5	22	O ----- 06	<p>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</p> <p>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.</p> <p>Unit 2 Action:</p> <p>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.</p> <p>This portion has a status of Open.</p> <p>-----</p> <p>LICENSE CONDITION – (6f) Accident monitoring instrumentation II.F.1 – containment hydrogen</p> <p>In SSER5, NRC closed the LICENSE CONDITION for Unit 1 only (IR 390/84-85).</p> <p>Unit 2 Action: Verify installation of containment hydrogen accident monitoring instrumentation.</p> <p>This portion has a status of Closed/Implementation only per NRC May 28, 2008, letter.</p> <p>-----</p> <p>LICENSE CONDITION – (9) Hydrogen control measures</p>

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			<p>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)}.</p> <hr/> <hr/> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>Amendment 95 to the Unit 2 FSAR was submitted on November 24, 2009. This amendment deleted the hydrogen recombiners from the Unit 2 FSAR.</p> <hr/> <hr/> <p>REVISION 04 UPDATE:</p> <p>EDCR 52329 was initiated to abandon in place Unit 2 hydrogen recombiners.</p> <p>Technical Specifications (TS) / TS BASES 3.6.7 (Hydrogen Recombiners) were deleted in Developmental Revision B which was submitted on February 2, 2010.</p> <hr/> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 6.2.5 of SSER22 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.2.6	22	S ----- 06	<p>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.</p> <p>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.</p> <hr/> <hr/> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <hr/> <hr/> <p>REVISION 06 UPDATE:</p> <p>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, 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</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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)."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>-----</p> <p>TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 47:</p> <p>"TVA provided an update to FSAR Section 6.2.6 in Amendment 104."</p>
6.4.0	22	C ----- 06	<p>In SSER5, the staff concluded that removal of the main control room air intake chlorine detector was acceptable.</p> <p>In SSER11, they stated that FSAR Amendment 69 on control room isolation did not change previous conclusions.</p> <p>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.</p> <p>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.</p> <p>See 18.1.0 also.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.5.1	22	C ----- 06	<p>In SSER5, the staff found the Reactor Building Purge Ventilation System acceptable.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>REVISION 06 UPDATE:</p>

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			<p>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 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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
6.5.3	22	O 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>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)."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>TVA to NRC letter dated June 7, 2011, provided the following response to this item:</p> <p>"No TVA action is required for this item."</p>
7.1.2	22	C 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-10 of SSER22 has "1" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
7.2.2	22	C 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-10 of SSER22 has "1" in the "Note" column for this item.</p> <p>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</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			necessary and this section remains Resolved."
			SSER22 shows the status for this item as "Resolved."
7.2.3	22	C ----- 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Page 1-10 of SSER22 has "1" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
7.3.3	22	C ----- 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Page 1-11 of SSER22 has "1" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
8.1.0	22	S ----- 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 8.1 of SSER22 included the following:</p> <p>"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.</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>This is Open Item 26 (Appendix HH)."</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>-----</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to this Open Item 26:</p> <p>"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:</p> <ul style="list-style-type: none"> • 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 <p>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.</p> <p>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."</p> <p>[See letter for Tables.]</p>
8.2.1	22	S ----- 06	<p>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.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>-----</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 27:</p> <p>"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.'</p> <p>A separate load flow was performed for a dual unit shutdown resulting from an abnormal operational</p>

SER SECTION	SSER #	REV.	ADDITIONAL INFORMATION
			<p>occurrence with and without offsite power. The resulting loading on CSSTs is provided in the following table:</p> <p>[See letter for Table.]</p> <p>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.</p> <p>This additional analysis will be included in the next revision of AC Auxiliary Power System Analysis Calculation EDQ00099920070002."</p>
8.2.2	22	S 06	<p>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</p> <p>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.</p> <p>-----</p> <p>8.2.2.2 OUTSTANDING ISSUE involving compliance of design changes to the offsite power system with GDC 17 and 18.</p> <p>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.</p> <p>-----</p> <p>8.2.2.3 Compliance with GDC 17 for the Duration of the Offsite System Contingencies</p> <p>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.</p> <p>-----</p> <p>8.2.2.4 Minimizing the Probability of a Two-Unit Trip Following a One-Unit Trip</p> <p>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.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is "Open (NRR)."</p> <p>-----</p> <p>REVISION 06 UPDATE:</p>

Section 8.2.2 of SSER22 included:

"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)."

"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

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			<p>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.)</p> <p>d. Bounding value & Post unit trip value: 153 kV (Minimum)</p> <p>(The grid studies establish that there are no voltage criteria violations under all grid operating conditions.)</p> <p>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.</p> <p>f. Design operating voltage range of the shutdown boards: 7,260 V max; 6,570 V min</p> <p>g. How low the WBHS voltage can drop: 153 kV"</p>
8.2.3	22	S 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>SSER22 shows the status for this item as "Resolved."</p>
8.2.4	22	O 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p>
8.3.1	22	S 06	<p>8.3 Fifth Diesel Generator</p> <p>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.</p> <p>8.3.1.1: CONFIRMATORY ISSUE - incorporate new design that provides dedicated transformer for each preferred offsite circuit in FSAR</p> <p>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.</p>

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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

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

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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

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			required loads. This provides assurance that the voltage has decayed on the boards and no residual out of phase reconnection occurs."
8.3.2	22	S	8.3.2.2: LICENSE CONDITION -- DC monitoring and annunciation system
		06	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:

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			<p>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)."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>-----</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 33:</p> <p>"The applicable DCNs are as follow:</p> <ul style="list-style-type: none"> • 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. <p>NRC will be notified when the physical work has been completed for these two DCNs."</p>
8.3.3	22	S ----- 06	<p>8.3.3.1.1: CONFIRMATORY ISSUE involving submergence of electrical equipment as result of a LOCA</p> <p>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.</p> <p>-----</p> <p>8.3.3.1.3 Failure Analysis of Circuits Associated with Cables and Cable Splices Unqualified for Submergence</p> <p>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.</p> <p>Unit 2 Action: Revise calculation for WBN Unit 2.</p> <p>-----</p> <p>8.3.3.1.2: CONFIRMATORY ISSUE - verify design for bypass of thermal overload protective device</p> <p>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.</p> <p>-----</p> <p>8.3.3.1.4 Use of Waterproof Splices in Potentially Submersible Sections of Underground Duct Runs</p> <p>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.</p> <p>-----</p> <p>8.3.3.1.5 Dow Corning RTV-3140 Used to Repair Damaged Kapton Insulated Conductors</p>

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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.

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."

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)."

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
8.4.0	22	CI ----- 06	<p>Station Blackout (SBO) - SE for both units - March 18, 1993; SSE for both units - September 9, 1993.</p> <p>Unit 2 Action: Implement SBO requirements.</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 8.4.8 of SSER22 (Summary and Conclusions) stated:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p>
9.1.2	22	C ----- 06	<p>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.</p> <p>In SSER15, the staff reviewed TVA's proposed resolution of the Boraflex degradation issue and found it acceptable.</p> <p>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.</p> <p>-----</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 9.1.2 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
9.1.4	22	S	LICENSE CONDITION – Control of heavy loads (NUREG-0612)
		06	<p>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.</p> <p>Unit 2 Action: Implement NEI guidance on heavy loads.</p>
			<p>REVISION 06 UPDATE:</p> <p>Section 9.1.4 included:</p> <p>"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).</p> <p>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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>TVA to NRC letter dated April 6, 2011, provided the following response to Open Item 34:</p> <p>"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.</p> <p>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.'"</p>
9.2.3	22	C	Approved for both units in SER.
		06	<p>REVISION 06 UPDATE:</p> <p>Section 9.2.3 included:</p> <p>"Therefore, the design of the demineralized water makeup system described in Section 9.2.3 of the WBN Unit 2 FSAR is acceptable."</p> <p>SSER22 shows the status for this item as "Resolved."</p>

SER SECTION	SSER #	* --- REV.		ADDITIONAL INFORMATION
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9.2.4	22	C	-----	<p>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.</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 9.2.4 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
		06	-----	
9.2.6	22	C	-----	<p>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.</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 9.2.6 included:</p> <p>"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 challenge the system design or major changes to the system description that would change the staff's conclusion in the SER.</p> <p>Therefore, the staff finds that the conclusions of the SER remain valid, and that WBN Unit 2 FSAR Section 9.2.6 is acceptable."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
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9.3.1	22	C	-----	<p>Approved for both units in SER.</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-14 of SSER22 has "1" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
		06	-----	

SER SECTION	SSER #	★ REV.	ADDITIONAL INFORMATION
			<p>Section 9.3.1 included:</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.3.3	22	C 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-15 of SSER22 has "3" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.3.4	22	C 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-15 of SSER22 has "3" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.3.8	22	C 06	<p>REVISION 06 UPDATE:</p> <p>9.3.8 stated:</p> <p>"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.</p> <p>The heat tracing system is not explicitly covered in the SER; therefore, TVA proposed to describe the</p>

SER SECTION	SSER #	REV.	ADDITIONAL INFORMATION
			<p>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.</p> <p>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.</p> <p>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."</p>
9.4.1	22	C 06	<p>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.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 9.4.1 included:</p> <p>"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 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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.4.2	22	C 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 9.4.2 included:</p> <p>"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."</p>

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Resolved."
9.4.3	22	C 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 9.4.3 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.4.4	22	C 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 9.4.4 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.4.5	22	C 06	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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.</p> <p>-----</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 9.4.5 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.4.6	22	C ----- 06	<p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 9.4.6 included:</p> <p>"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."</p> <p>SSER22 did not provide a status for this item.</p>
9.4.7	22	C ----- 06	<p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 9.4.7 included:</p> <p>"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."</p> <p>SSER22 did not provide a status for this item.</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
9.4.8	22	C ----- 06	<p>REVISION 06 UPDATE:</p> <p>Section 9.4.8 included:</p> <p>"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."</p> <p>SSER22 did not provide a status for this item.</p>
9.5.3	22	C ----- 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>Section 9.5.3 included:</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.5.4	22	C ----- 06	<p>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</p> <p>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.</p> <p>-----</p> <p>9.5.4.1: LICENSE CONDITION – Diesel Generator reliability</p> <p>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.</p> <p>-----</p> <p>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.</p> <p>In SSER5, the staff resolved the issue of the completeness of its review of the emergency diesel engine</p>

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 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."

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			SSER22 shows the status for this item as "Resolved."
9.5.6	22	C ----- 06	<p>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</p> <p>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.</p> <p>-----</p> <p>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 submittal dated July 28, 1993, that they did not plan to place the additional diesel generator in service.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-16 of SSER22 has "2" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.5.7	22	C ----- 06	<p>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</p> <p>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.</p> <p>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.</p> <p>-----</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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</p> <p>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.</p> <p>-----</p> <p>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.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-16 of SSER22 has "2" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
9.5.8	22	C ----- 06	<p>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</p> <p>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.</p> <p>-----</p> <p>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.</p> <p>-----</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Page 1-16 of SSER22 has "2" in the "Note" column for this item.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.2.1	22	C ----- 06	<p>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.</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 10.2.1 included:</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.3.1	22	C ----- 06	<p>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.</p> <p>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.</p> <p>-----</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p>

SER SECTION	SSER #	REV.	ADDITIONAL INFORMATION
			REVISION 06 UPDATE: Section 10.3.1 included: "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."
10.3.3	22	C 06	Approved for both units in SER. REVISION 06 UPDATE: Section 10.3.3 included: "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."

SER SECTION	SSER #	* ----- REV.		ADDITIONAL INFORMATION
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10.3.4	22	S		LICENSE CONDITION – Secondary water chemistry monitoring and control program
		06		<p>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.</p> <p>Unit 2 Action: Take same action for Unit 2.</p> <p>-----</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009.</p> <p>Section 5.7.2.13 provides information about the Secondary Water Chemistry Program.</p> <p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 10.3.4 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.4.1	22	C		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.
		06		<p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 10.4.1 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.4.2	22	C		Approved for both units in SER.
		06		<p>-----</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 10.4.2 included:</p> <p>"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</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.4.3	22	C ----- 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>Section 10.4.3 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.4.4	22	C ----- 06	<p>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.</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>REVISION 06 UPDATE:</p> <p>Section 10.4.4 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.4.5	22	C ----- 06	<p>Approved for both units in SER.</p> <p>REVISION 06 UPDATE:</p> <p>Section 10.4.5 included:</p> <p>"The NRC staff reviewed the CCW system for compliance with the applicable GDC, RGs, and BTPs and</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
10.4.6	22	S ----- 06	<p>Approved for both units in SER.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 10.4.6 included:</p> <p>"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.</p> <p>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.</p> <p>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)."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <hr/> <p>TVA to NRC letter dated June 7, 2011, provided the following response to Open Item 35:</p> <p>"TVA provided an update to FSAR Section 10.4.6 in Amendment 104."</p>
10.4.7	22	C ----- 06	<p>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.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 10.4.7 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
10.4.8	22	S	Approved for both units in SER.
		06	
			REVISION 06 UPDATE:
			Section 10.4.8 included:
			"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.
			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.

SER SECTION	SSER #	* REV.	ADDITIONAL INFORMATION
10.4.10	22	C	
		06	<p>REVISION 06 UPDATE:</p> <p>Section 10.4.10 included:</p> <p>"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."</p> <p>SSER22 did not provide a status for this item.</p>
10.4.11	22	C	
		06	<p>REVISION 06 UPDATE:</p> <p>Section 10.4.11 included:</p> <p>"Because the steam generator wet layup system is not used at WBN, the NRC staff did not review FSAR Section 10.4.11."</p> <p>SSER22 did not provide a status for this item.</p>
13.1.0	22	C	<p>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.</p>
		06	<p>REVISION 06 UPDATE:</p> <p>Section 13.1 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
13.1.3	22	O	<p>LICENSE CONDITION – Use of experienced personnel during startup</p>
		06	<p>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.</p> <p>Unit 2 Action: Submit staffing and NQAP for two unit operation.</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>REVISION 06 UPDATE:</p> <p>Section 13.1.3 included:</p> <p>"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:</p> <ol style="list-style-type: none"> 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. <p>These are Open Items 9, 10, and 11 (Appendix HH)."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p> <p>-----</p> <p>Per TVA letter to NRC dated April 6, 2011, Open Items 9 and 11 are for NRC Inspection / Review.</p>
13.2.1	22	C ----- 06	<p>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.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 13.2.1 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
13.3.1	22	O ----- 06	<p>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.</p> <p>Unit 2 Action: Submit WBN REP for two unit operation.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p>

ADDITIONAL INFORMATION

Section included:

"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 10 CFR 50.54(q)."

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

13.3.2	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 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.
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Unit 2 Action: Submit WBN REP for two unit operation.

REVISION 06 UPDATE:

Section 13.3.2.18 included:

"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)."

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.
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Unit 2 Action: Submit WBN REP for two unit operation.

REVISION 06 UPDATE:

Section 13.3.3 included:

"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)."

SER SECTION	SSER #	* ----- REV.		ADDITIONAL INFORMATION
13.4.0	22	OV		LICENSE CONDITION - Independent Safety Engineering Group (ISEG) (NUREG-0737, I.B.1.2)
		06		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 included: "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		Approved for both units in SER.
		06		----- ----- REVISION 06 UPDATE: SSER22 shows the status for this item as "Resolved."
13.5.1	22	C		Approved for both units in SER.
		06		----- ----- REVISION 02 UPDATE: The status in SSER21 is Open (NRR). ----- ----- REVISION 06 UPDATE: Section 13.5.1 included: "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

SER SECTION	SSER #	* --- REV.
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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	OUTSTANDING ISSUE involving operating, maintenance and emergency procedures
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06

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 included:

"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."

SER SECTION	SSER #	--- REV.	ADDITIONAL INFORMATION
13.5.3	22	C 06	<p>LICENSE CONDITION – Report on outage of emergency core cooling system (NUREG-0737, II.K.3.17)</p> <p>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.</p> <p>-----</p> <p>Reporting of Safety Valve and Relief Valve Failures and Challenges (II.K.3.3)</p> <p>In SSER16, NRC reviewed TVA revised commitment to report failures and challenges to PORVs and safety valves in accordance with the Technical Specifications.</p> <p>Unit 2 Action:</p> <p>Include, as necessary, in the Technical Specifications.</p> <p>CT in NRC May 28, 2008, letter.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (Inspection).</p> <p>-----</p> <p>Developmental Revision A of the Unit 2 Technical Specifications (TS) was submitted on March 04, 2009.</p> <p>Rev. 0 of the Unit 1 TS contained 5.9.4 (Monthly Operating Reports) which implemented the above commitment for Unit 1.</p> <p>Amendment 57 to the Unit 1 TS (approved by the NRC on March 21, 2005) deleted this section of the TS.</p> <p>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.</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 13.5.3 included:</p> <p>"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. ..."</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
13.6.0	22	C	OUTSTANDING ISSUE to file appropriate revision to the Physical Security Plan
		06	<p>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.</p> <p>-----</p> <p>LICENSE CONDITION – Physical security of fuel in containment</p> <p>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.</p> <p>-----</p> <p>LICENSE CONDITION - Land Vehicle Bomb Control Program</p> <p>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.</p> <p>-----</p> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <p>-----</p> <p>REVISION 06 UPDATE:</p> <p>Section 13.6.5 (Conclusions) included:</p> <p>"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.</p> <p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
17.3.0	22	C	OUTSTANDING ISSUE - QA program
		06	<p>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</p>

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			comment. ----- -----
			REVISION 06 UPDATE: Section 17.3 included: "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."
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 DCRDR 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 included: "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

SER SECTION	SSER #	* --- REV.	ADDITIONAL INFORMATION
			<p>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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
18.2.0	22	CI ----- 06	<p>"CONCLUSIONS" left open until all items in subsection are closed.</p> <hr/> <p>REVISION 02 UPDATE:</p> <p>The status in SSER21 is Open (NRR).</p> <hr/> <p>TVA's September 26, 2008, letter proposed the use of the Unit 1 approach to resolve the CRDR SP.</p> <hr/> <p>In SSER21, the Detailed Control Room Design Review (CRDR) Special Program was resolved.</p> <hr/> <p>REVISION 06 UPDATE:</p> <p>Section 18.2 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Resolved."</p>
22.3.0	22	O ----- 06	<p>REVISION 06 UPDATE:</p> <p>Section 22.3 included:</p> <p>"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."</p> <p>SSER22 shows the status for this item as "Open (NRR)."</p>

SER SECTION	SSER #	* — — — REV.	ADDITIONAL INFORMATION
25.9.0	22	O	
		06	REVISION 06 UPDATE: Section 25.9 included: "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 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.
- 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.