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

June 7, 2011

10 CFR 50.4(b)(6)
10 CFR 50.34(b)

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

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

Subject: **Watts Bar Nuclear Plant (WBN) Unit 2 – Safety Evaluation Report Supplement 22 (SSER 22) - Second Response to NRC Required Action Items**

References:

1. "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2, Docket No. 50-391, Tennessee Valley Authority, Date Published: February 2011, U.S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation, NUREG-0847 Supplement 22"

2. TVA to NRC letter dated April 6, 2011, "Watts Bar Nuclear Plant (WBN) Unit 2 - Safety Evaluation Report Supplement 22 (SSER 22) - Response to NRC Required Action Items"

Appendix HH of Reference 1 contained 51 required action items associated with open items, confirmatory issues, and proposed license conditions that the staff had identified. In Enclosure 1 of Reference 2, TVA provided responses to 21 of these items. Subsequent to these 51 items being issued in SSER 22, NRC provided additional action items that were identified as potential open issues that may be published in SSER 23. These potential items are numbered alphanumerically herein since they do not have an official SSER Action Item number. Enclosure 1 of this letter provides responses to 5 of the SSER 22 items and 6 of the potential action items.

Item 29 of SSER 22, Appendix HH incorrectly describes the open item from SSER 22 Section 8.2.2. The item listed in Appendix HH was actually closed in SSER 22. TVA believes the correct SSER 22, Item 29 from Section 8.2.2, is addressed in Enclosure 1 of this letter.

Enclosure 2 lists the 7 SSER 22 action items and 6 potential action items for which TVA will provide responses at a later date.

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Enclosure 3 lists the 20 SSER 22 action items and 7 potential action items which require NRC inspection/review. A status is also provided for three items ready for inspection and one item previously closed by inspection.

Enclosure 4 provides a summary status for all SSER action items received to date.

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 7th day of June, 2011.

Respectfully,

E. E. Freeman
Watts Bar Unit 2 Completion Manager

Enclosures:

1. Response to Action Items From Appendix HH of NUREG-0847, Supplement 22
2. Action Items From Appendix HH of NUREG-0847, Supplement 22 to Be Answered Later
3. Action Items From Appendix HH of NUREG-0847, Supplement 22 For NRC Inspection/Review
4. Summary status for SSER items received to date

cc (Enclosures):

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ENCLOSURE 1

Response to Action Items From Appendix HH of NUREG-0847, Supplement 22 and Additional Items Provided by NRC Email

Tennessee Valley Authority - Watts Bar Nuclear Plant - Unit 2, Docket No. 50-391

The item numbers used below either correspond to item numbers in SSER 22, Appendix HH or additional potential items provided by the NRC.

4. *Conduct appropriate inspection activities to verify that TVA's maximum SWBP criteria for signal level and coaxial cables do not exceed the cable manufacturers maximum SWBP criteria. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*

   TVA Response: This item is complete and closed in NRC Inspection Report 2010604.

29. *Provide a detailed description of the transmission system grid conditions and the operating characteristics of the offsite power supply at the Watts Bar Hydro (for dual-unit operation), including the operating voltage range, post contingency voltage drops (including bounding values and post-unit trip values), and operating frequency range. Provide the design operating voltage range of the shutdown boards (minimum and maximum voltage) and information regarding how low the Watts Bar Hydro Station voltage could drop (assuming operation of the LTCs) while still supplying the worst-case shutdown board loads at the minimum design voltage of the shutdown boards. The summary of the grid studies should address dual-unit operation, the transmission network interface available fault current changes, and the impact on the switchyard and plant switchgear and cabling. (Section 8.2.2)*

    TVA Response: 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: $\geq$ 153 kV and $\leq$ 9 kV drop (post-event)
   - 24 kV Generator Buses*: $\geq$ 23 kV and $\leq$ 24.8 kV

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

c. Post-contingency voltage drops (dual-unit operation): 9 kV Maximum

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

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

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

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

f. Design operating voltage range of the shutdown boards: 7,260 V max; 6,570 V min

g. How low the WBHS voltage can drop: 153 kV

35. *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. (Section 10.4.6)*

<u>TVA Response</u>: TVA provided an update to FSAR Section 10.4.6 in Amendment 104.

ENCLOSURE 1

Response to Action Items From Appendix HH of NUREG-0847, Supplement 22 and Additional Items Provided by NRC Email

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47. *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 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. (Section 6.2.6)*

    TVA Response: TVA provided an update to FSAR Section 6.2.6 in Amendment 104.

48. *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. (Section 6.5.3)*

    TVA Response: No TVA action is required for this item.

Note: Responses provided below are for potential open items associated with future SSER revisions.

A. *TVA should provide an update to the FSAR replacing Table 12.2-3 with the expected source strength values of the freshly irradiated IITAs. (Section 12.3)*

    TVA Response: TVA provided an update to FSAR Section 12.2.1.3 and inserted Table 12.2-13 in Amendment 104.

B. *The staff's evaluation of the compatibility of the ESF system materials with containment sprays and core cooling water in the event of a LOCA is incomplete pending resolution of GSI-191 for WBN Unit 2. (Section 6.1.1.4)*

    TVA Response: This issue was addressed by TVA letter dated March 4, 2011, Item 3.o.1.

C. *TVA should amend the FSAR description of the design and operation of the spent fuel pool cooling and cleanup system in FSAR Section 9.1.3 as proposed in its December 21, 2010, letter to the NRC. (Section 9.1.3)*

    TVA Response: TVA provided an update to FSAR Section 9.1.3 as part of Amendment 103 submitted in TVA letter dated March 15, 2011.

E. *Confirm TVA's change to FSAR Section 10.4.9 to reflect its intention to operate with each CST isolated from the other. (Section 10.4.9)*

    TVA Response: TVA provided an update to FSAR Section 10.4.9 as part of Amendment 103 submitted in TVA letter dated March 15, 2011.

ENCLOSURE 1

Response to Action Items From Appendix HH of NUREG-0847, Supplement 22 and Additional Items Provided by NRC Email

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H. *TVA should provide justification to the staff regarding why different revisions of WCAP-13869 are referenced in WBN Unit 1 and Unit 2. (Section 7.2.1.1)*

TVA Response: TVA to NRC letter dated March 31, 2011, addressed this item in NRC Request 14 (matrix item 323). The resultant change to the Unit 2 FSAR was provided in Amendment 104 submitted in TVA to NRC letter dated June 3, 2011.

N. *TVA should confirm to the staff the replacement of the current Unit 2 clevis insert bolts to the latest design, which uses an X-750 alloy with an HTH process, rolled threads, and a larger radius on the undercut of the cap screw head. (Section 3.9.5)*

TVA Response: TVA to NRC letter dated April 21, 2011, provided a basis for non-replacement of the Unit 2 clevis insert bolts.

ENCLOSURE 2

Action Items From Appendix HH of NUREG-0847, Supplement 22/Draft Supplement 23 To Be Answered Later

Tennessee Valley Authority - Watts Bar Nuclear Plant - Unit 2, Docket No. 50-391

The item numbers used below correspond to item numbers in SSER 22, Appendix HH.

10. *Confirm that 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. (Section 13.1.3)*

13. *TVA is expected to submit an IST program and specific relief requests for WBN Unit 2 nine months before the projected date of OL issuance. (Section 3.9.6)*

25. *Prior to the issuance of an operating license, TVA is required to provide satisfactory documentation that it has obtained the maximum secondary liability insurance coverage pursuant to 10 CFR 140.11(a)(4), and not less than the amount required by 10 CFR 50.54(w) with respect to property insurance, and the NRC staff has reviewed and approved the documentation. (Section 22.3)*

30. *TVA should confirm that all other safety-related equipment (in addition to the Class 1E motors) will have adequate starting and running voltage at the most limiting safety related components (such as motor operated valves, contactors, solenoid valves or relays) at the degraded voltage relay setpoint dropout setting. TVA should also confirm that the final Technical Specifications are properly derived from these analytical values for the degraded voltage settings. (Section 8.3.1.2)*

32. *TVA should provide to the NRC staff the details of the administrative limits of EDG voltage and speed range, and the basis for its conclusion that the impact is negligible, and describe how it accounts for the administrative limits in the Technical Specification surveillance requirements for EDG voltage and frequency. (Section 8.3.1.14)*

37. *The NRC staff will review the combined WBN Unit 1 and 2 Appendix C prior to issuance of the Unit 2 OL to confirm (1) that the proposed Unit 2 changes were incorporated into Appendix C, and (2) that changes made to Appendix C for Unit 1 since Revision 92 and the changes made to the NP-REP since Revision 92 do not affect the bases of the staff's findings in this SER supplement. (Section 13.3.2)*

43. *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 operating license. Completion of this requirement will be confirmed by the NRC staff prior to the issuance of an operating license. (Section 13.3.2.18)*

D. *TVA should provide information to the NRC staff to demonstrate that PAD 4.0 can conservatively calculate the fuel temperature and other impacted variables, such as stored energy, given the lack of a fuel thermal conductivity degradation model. (Section 4.2.2.1)*

F. *TVA should confirm to the NRC staff that testing prior to Unit 2 fuel load has demonstrated that two-way communications is impossible with the Eagle 21 communications interface. (Section 7.2.1.1)*

ENCLOSURE 2

Action Items From Appendix HH of NUREG-0847, Supplement 22/Draft Supplement 23 To Be Answered Later

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G. *TVA stated that, "Post modification testing will be performed to verify that the design change corrects the Eagle 21, Rack 2 RTD accuracy issue prior to WBN Unit 2 fuel load. This issue is open pending NRC review of the testing results.*

I. *TVA should clarify FSAR Section 9.2.5 to add the capability of the UHS to bring the non accident unit to cold shutdown within 72 hours. (SRP Section 9.2.5)*

K. *TVA should clarify to the NRC staff how the CSS complies with GDC 5. (Section 9.2.2).*

M. *TVA should provide the revised WBN Unit 2 PSI program ASME Class 1, 2, and 3 Supports "Summary Tables," to include numbers of components so that the NRC staff can verify that the numbers meet the reference ASME Code. (Section 3.2.3 of Appendix Z of this SSER).*

ENCLOSURE 3

Action Items From Appendix HH of NUREG-0847, Supplement 22/Draft Supplement 23 For NRC Inspection / Review

Tennessee Valley Authority - Watts Bar Nuclear Plant - Unit 2, Docket No. 50-391

The item numbers used below correspond to item numbers in SSER 22, Appendix HH. A **TVA response is provided only for items with an updated status.**

1. *Review evaluations and corrective actions associated with a power assisted cable pull. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*

TVA Response: This item is ready for closure and is addressed by Commitment Closure package 10181059. The closure package has been provided to the WBN Unit 2 NRC Resident Inspectors.

2. *Conduct appropriate inspection activities to verify cable lengths used in calculations and analysis match as-installed configuration. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*

4. *Conduct appropriate inspection activities to verify that TVA's maximum SWBP criteria for signal level and coaxial cables do not exceed the cable manufacturers maximum SWBP criteria. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*

TVA Response: This item is complete and closed in NRC Inspection Report 2010604.

7. *Verify commitment completion and review electrical design calculations. (TVA letter dated October 9, 1990, ADAMS Accession No. ML073551056)*

9. *Confirm that education and experience of management and principal supervisory positions down through the shift supervisory level conform to Regulatory Guide 1.8. (Section 13.1.3)*

11. *The plant administrative procedures should clearly state that, when the Assistant Shift Engineer assumes his duties as Fire Brigade Leader, his control room duties are temporarily assumed by the Shift Supervisor (Shift Engineer), or by another SRO, if one is available. The plant administrative procedures should clearly describe this transfer of control room duties. (Section 13.1.3)*

12. *TVA's implementation of NGDC PP-20 and EDCR Appendix J is subject to future NRC audit and inspection. (Section 25.9)*

16. *Based on the uniqueness of EQ, the NRC staff must perform a detailed inspection and evaluation prior to fuel load to determine how the WBN Unit 2 EQ program complies with the requirements of 10 CFR 50.49. (Section 3.11.2)*

17. *The NRC staff should verify the accuracy of the WBN Unit 2 EQ list prior to fuel load. (Section 3.11.2.1)*

ENCLOSURE 3

Action Items From Appendix HH of NUREG-0847, Supplement 22/Draft Supplement 23 For NRC Inspection / Review

Tennessee Valley Authority - Watts Bar Nuclear Plant - Unit 2, Docket No. 50-391

19. *The NRC staff should complete its review of TVA's EQ Program procedures for WBN Unit 2 prior to fuel load. (Section 3.11.2.2.1)*

TVA Response: 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.

21. *The NRC staff should confirm that the Electrical Penetration Assemblies (EPAs) are installed in the tested configuration, and that the feedthrough module is manufactured by the same company and is consistent with the EQ test report for the EPA. (Section 3.11.2.2.1)*

TVA Response: The closure package has been provided to the WBN Unit 2 Resident Inspectors.

38. *The NRC staff will confirm the availability and operability of the ERDS for Unit 2 prior to issuance of the Unit 2 OL. (Section 13.3.2.6)*

39. *The NRC staff will confirm the adequacy of the communications capability to support dual unit operations prior to issuance of the Unit 2 OL. (Section 13.3.2.6)*

40. *The NRC staff will confirm the adequacy of the emergency facilities and equipment to support dual unit operations prior to issuance of the Unit 2 OL. (Section 13.3.2.8)*

41. *TVA committed to (1) update plant data displays as necessary to include Unit 2, and (2) to update dose assessment models to provide capabilities for assessing releases from both WBN units. The NRC staff will confirm the adequacy of these items prior to issuance of the Unit 2 OL. (Section 13.3.2.9)*

42. *The NRC staff will confirm the adequacy of the accident assessment capabilities to support dual unit operations prior to issuance of the Unit 2 OL. (Section 13.3.2.9)*

48. *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. (Section 6.5.3)*

49. *The NRC staff was unable to determine how TVA linked the training qualification requirements of ANSI N45.2-1971 to TVA Procedure TI-119. Therefore, the implementation of training and qualification for inspectors will be the subject of future NRC staff inspections. (NRC letter dated July 2, 2010, ADAMS Accession No. ML101720050)*

50. *TVA stated that about 5 percent of the anchor bolts for safety-related pipe supports do not have quality control documentation, because the pull tests have not yet been performed. Since the documentation is still under development, the NRC staff will*

conduct inspections to follow-up on the adequate implementation of this construction refurbishment program requirement. (NRC letter dated July 2, 2010, ADAMS Accession No. ML101720050)

51. *The implementation of TVA Procedure TI-119 will be the subject of NRC follow-up inspection to determine if the construction refurbishment program requirements are being adequately implemented. (NRC letter dated July 2, 2010, ADAMS Accession No. ML101720050)*

J. *TVA should confirm, and the NRC staff should verify, that the component cooling booster pumps for Unit 2 are above PMF level. (Section 9.2.2)*

L. *The WBN Unit 2 RCS vent system is acceptable, pending verification that the RCS vent system is installed. (Section 5.4.5)*

O. *Based on its review, the staff asked TVA several questions regarding the ICC instrumentation. TVA responded to the staff questions by letter dated October 26, 2010 (ADAMS Accession No. ML103020322). The NRC staff has not completed the review of the additional information provided by TVA. The staff will provide its evaluation after completion of that review. (Section 4.4.8)*

P. *The NRC staff will inspect to confirm that TVA has completed the WBN Unit 2 EOPs prior to fuel load. (Section 7.5.3)*

Q. *The NRC staff will verify installation of the acoustic-monitoring system for the power-operated relief valve (PORV) position indication in WBN Unit 2 before fuel load. (Section 7.8.1)*

R. *The NRC staff will verify that the test procedures and qualification testing for auxiliary feedwater initiation and control and flow indication are completed in WBN Unit 2 before fuel load. (Section 7.8.2)*

S. *The NRC staff will verify that the derivative time constant is set to zero in WBN Unit 2 before fuel load. (Section 7.8.3)*

ENCLOSURE 4
Watts Bar Nuclear Plant, Unit 2
Status Listing of SSER Open Items

SSER Item No.	SSER Item Description	TVA Status
1.	*Review evaluations and corrective actions associated with a power assisted cable pull. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*	For NRC Inspection / Review
2.	*Conduct appropriate inspection activities to verify cable lengths used in calculations and analysis match as-installed configuration. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*	For NRC Inspection / Review
3.	*Confirm TVA submitted update to FSAR section 8.3.1.4.1. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
4.	*Conduct appropriate inspection activities to verify that TVA's maximum SWBP criteria for signal level and coaxial cables do not exceed the cable manufacturers maximum SWBP criteria. (NRC safety evaluation dated August 31, 2009, ADAMS Accession No. ML092151155)*	Closed by IR 2010604
5.	*Verify timely submittal of pre-startup core map and perform technical review. (TVA letter dated September 7, 2007, ADAMS Accession No. ML072570676)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
6.	*Verify implementation of TSTF-449. (TVA letter dated September 7, 2007, ADAMS Accession No. ML072570676)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
7.	*Verify commitment completion and review electrical design calculations. (TVA letter dated October 9, 1990, ADAMS Accession No. ML073551056)*	For NRC Inspection / Review
8.	*Verify rod control system operability during power ascension. TVA should provide a pre-startup map to the NRC staff indicating the rodded fuel assemblies and a projected end of cycle burnup of each rodded assembly for the initial fuel cycle 6-months prior to fuel load. (NRC safety evaluation dated May 3, 2010, ADAMS Accession No. ML101200035)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
9.	*Confirm that education and experience of management and principal supervisory positions down through the shift supervisory level conform to Regulatory Guide 1.8. (Section 13.1.3)*	For NRC Inspection / Review
10.	*Confirm that 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. (Section 13.1.3)*	TVA to answer later.

ENCLOSURE 4
Watts Bar Nuclear Plant, Unit 2
Status Listing of SSER Open Items

SSER Item No.	SSER Item Description	TVA Status
11.	*The plant administrative procedures should clearly state that, when the Assistant Shift Engineer assumes his duties as Fire Brigade Leader, his control room duties are temporarily assumed by the Shift Supervisor (Shift Engineer), or by another SRO, if one is available. The plant administrative procedures should clearly describe this transfer of control room duties. (Section 13.1.3)*	For NRC Inspection / Review
12.	*TVA's implementation of NGDC PP-20 and EDCR Appendix J is subject to future NRC audit and inspection. (Section 25.9)*	For NRC Inspection / Review
13.	*TVA is expected to submit an IST program and specific relief requests for WBN Unit 2 nine months before the projected date of OL issuance. (Section 3.9.6)*	TVA to answer later.
14.	*TVA stated that the Unit 2 PTLR is included in the Unit 2 System Description for the Reactor Coolant System (WBN2-68-4001), which will be revised to reflect required revisions to the PTLR by September 17, 2010. (Section 5.3.1)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
15.	*TVA should confirm to the NRC staff the completion of Primary Stress Corrosion Cracking (PWSCC) mitigation activities on the Alloy 600 dissimilar metal butt welds (DMBWs) in the primary loop piping. (Section 3.6.3)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
16.	*Based on the uniqueness of EQ, the NRC staff must perform a detailed inspection and evaluation prior to fuel load to determine how the WBN Unit 2 EQ program complies with the requirements of 10 CFR 50.49. (Section 3.11.2)*	For NRC Inspection / Review
17.	*The NRC staff should verify the accuracy of the WBN Unit 2 EQ list prior to fuel load. (Section 3.11.2.1)*	For NRC Inspection / Review
18.	*Based on the extensive layup period of equipment within WBN Unit 2, the NRC staff must review, prior to fuel load, the assumptions used by TVA to re-establish a baseline for the qualified life of equipment. The purpose of the staff's review is to ensure that TVA has addressed the effects of environmental conditions on equipment during the layup period. (Section 3.11.2.2)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
19.	*The NRC staff should complete its review of TVA's EQ Program procedures for WBN Unit 2 prior to fuel load. (Section 3.11.2.2.1)*	For NRC Inspection / Review

ENCLOSURE 4
Watts Bar Nuclear Plant, Unit 2
Status Listing of SSER Open Items

SSER Item No.	SSER Item Description	TVA Status
20.	*Resolve whether or not routine maintenance activities should result in increasing the EQ of the 6.9 kV motors to Category I status in accordance with 10 CFR 50.49. (Section 3.11.2.2.1).*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
21.	*The NRC staff should confirm that the Electrical Penetration Assemblies (EPAs) are installed in the tested configuration, and that the feedthrough module is manufactured by the same company and is consistent with the EQ test report for the EPA. (Section 3.11.2.2.1)*	For NRC Inspection / Review
22.	*TVA must clarify its use of the term "equivalent" (e.g., identical, similar) regarding the replacement terminal blocks to the NRC staff. If the blocks are similar, then a similarity analysis should be completed and presented to the NRC for review. (Section 3.11.2.2.1)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
23.	*Resolve whether or not TVA's reasoning for not upgrading the MSIV solenoid valves to Category I is a sound reason to the contrary, as specified in 10 CFR 50.49(l). (Section 3.11.2.2.1)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
24.	*The NRC staff requires supporting documentation from TVA to justify its establishment of a mild environment threshold for total integrated dose of less than $1x10^3$ rads for electronic components such as semiconductors or electronic components containing organic material. (Section 3.11.2.2.1)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
25.	*Prior to the issuance of an operating license, TVA is required to provide satisfactory documentation that it has obtained the maximum secondary liability insurance coverage pursuant to 10 CFR 140.11(a)(4), and not less than the amount required by 10 CFR 50.54(w) with respect to property insurance, and the NRC staff has reviewed and approved the documentation. (Section 22.3)*	TVA to answer later.
26.	*For the scenario with an accident in one unit and concurrent shutdown of the second unit without offsite power, TVA stated that Unit 2 pre-operational testing will validate the diesel response to sequencing of loads on the Unit 2 emergency diesel generators (EDGs). The NRC staff will evaluate the status of this issue and will update the status of the EDG load response in a future SSER. (Section 8.1)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
27.	*TVA should provide a summary of margin studies*	Response provided in TVA

ENCLOSURE 4
Watts Bar Nuclear Plant, Unit 2
Status Listing of SSER Open Items

SSER Item No.	SSER Item Description	TVA Status
	based on scenarios described in Section 8.1 for CSSTs A, B, C, and D. (Section 8.2.2)	to NRC letter dated April 6, 2011 (Reference 2).
28.	*TVA should provide to the NRC staff a detailed discussion showing that the load tap changer 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. (Section 8.2.2)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
29.	*TVA should provide the transmission system specifics (grid stability analyses) to the NRC staff. In order to verify compliance with GDC 17, the results of the grid stability analyses must indicate that loss of the largest electric supply to the grid, loss of the largest load from the grid, loss of the most critical transmission line, or loss of both units themselves, will not cause grid instability. (Section 8.2.2)*	TVA response provided in Enclosure 1 of this letter.
30.	*TVA should confirm that all other safety-related equipment (in addition to the Class 1E motors) will have adequate starting and running voltage at the most limiting safety related components (such as motor operated valves, contactors, solenoid valves or relays) at the degraded voltage relay setpoint dropout setting. TVA should also confirm that the final Technical Specifications are properly derived from these analytical values for the degraded voltage settings. (Section 8.3.1.2)*	TVA to answer later.
31.	*TVA should evaluate the re-sequencing of loads, with time delays involved, in the scenario of a LOCA followed by a delayed LOOP, and ensure that all loads will be sequenced within the time assumed in the accident analysis. (Section 8.3.1.11)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
32.	*TVA should provide to the NRC staff the details of the administrative limits of EDG voltage and speed range, and the basis for its conclusion that the impact is negligible, and describe how it accounts for the administrative limits in the Technical Specification surveillance requirements for EDG voltage and frequency. (Section 8.3.1.14)*	TVA to answer later.
33.	*TVA stated in Attachment 9 of its letter dated July 31, 2010, that certain design change notices (DCNs) are required or anticipated for completion*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).

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SSER Item No.	SSER Item Description	TVA Status
	of WBN Unit 2, and that these DCNs were unverified assumptions used in its analysis of the 125 V dc vital battery system. Verification of completion of these DCNs to the NRC staff is necessary prior to issuance of the operating license. (Section 8.3.2.3)	
34.	*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. (Section 9.1.4)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
35.	*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. (Section 10.4.6)*	TVA response provided in Enclosure 1 of this letter.
36.	*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. (Section 10.4.8)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
37.	*The NRC staff will review the combined WBN Unit 1 and 2 Appendix C prior to issuance of the Unit 2 OL to confirm (1) that the proposed Unit 2 changes were incorporated into Appendix C, and (2) that changes made to Appendix C for Unit 1 since Revision 92 and the changes made to the NP-REP since Revision 92 do not affect the bases of the staff's findings in this SER supplement. (Section 13.3.2)*	TVA to answer later.
38.	*The NRC staff will confirm the availability and operability of the ERDS for Unit 2 prior to issuance of the Unit 2 OL. (Section 13.3.2.6)*	For NRC Inspection / Review
39.	*The NRC staff will confirm the adequacy of the communications capability to support dual unit operations prior to issuance of the Unit 2 OL. (Section 13.3.2.6)*	For NRC Inspection / Review
40.	*The NRC staff will confirm the adequacy of the emergency facilities and equipment to support dual unit operations prior to issuance of the Unit 2 OL. (Section 13.3.2.8)*	For NRC Inspection / Review
41.	*TVA committed to (1) update plant data displays as necessary to include Unit 2, and (2) to update*	For NRC Inspection / Review

SSER Item No.	SSER Item Description	TVA Status
	dose assessment models to provide capabilities for assessing releases from both WBN units. The NRC staff will confirm the adequacy of these items prior to issuance of the Unit 2 OL. (Section 13.3.2.9)	
42.	*The NRC staff will confirm the adequacy of the accident assessment capabilities to support dual unit operations prior to issuance of the Unit 2 OL. (Section 13.3.2.9)*	For NRC Inspection / Review
43.	*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 operating license. Completion of this requirement will be confirmed by the NRC staff prior to the issuance of an operating license. (Section 13.3.2.18)*	TVA to answer later.
44.	*TVA should provide additional information to clarify how the initial and irradiated RT_{NDT} was determined. (Section 5.3.1)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
45.	*TVA stated in its response to RAI 5.3.2-2, dated July 31, 2010, that the PTLR would be revised to incorporate the COMS arming temperature. (Section 5.3.2)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
46.	*The LTOP lift settings were not included in the PTLR, but were provided in TVA's response to RAI 5.3.2-2 in its letter dated July 31, 2010. TVA stated in its RAI response that the PTLR would be revised to incorporate the LTOP lift settings into the PTLR. (Section 5.3.2)*	Response provided in TVA to NRC letter dated April 6, 2011 (Reference 2).
47.	*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 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. (Section 6.2.6)*	TVA response provided in Enclosure 1 of this letter.
48.	*The NRC staff should verify that its conclusions*	TVA response provided in

SSER Item No.	SSER Item Description	TVA Status
	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. (Section 6.5.3)	Enclosure 1 of this letter.
49.	*The NRC staff was unable to determine how TVA linked the training qualification requirements of ANSI N45.2-1971 to TVA Procedure TI-119. Therefore, the implementation of training and qualification for inspectors will be the subject of future NRC staff inspections. (NRC letter dated July 2, 2010, ADAMS Accession No. ML101720050)*	For NRC Inspection / Review
50.	*TVA stated that about 5 percent of the anchor bolts for safety-related pipe supports do not have quality control documentation, because the pull tests have not yet been performed. Since the documentation is still under development, the NRC staff will conduct inspections to follow-up on the adequate implementation of this construction refurbishment program requirement. (NRC letter dated July 2, 2010, ADAMS Accession No. ML101720050)*	For NRC Inspection / Review
51.	*The implementation of TVA Procedure TI-119 will be the subject of NRC follow-up inspection to determine if the construction refurbishment program requirements are being adequately implemented. (NRC letter dated July 2, 2010, ADAMS Accession No. ML101720050)*	For NRC Inspection / Review
A	*TVA should provide an update to the FSAR replacing Table 12.2-3 with the expected source strength values of the freshly irradiated IITAs. (Section 12.3)*	TVA response provided in Enclosure 1 of this letter.
B	*The staff's evaluation of the compatibility of the ESF system materials with containment sprays and core cooling water in the event of a LOCA is incomplete pending resolution of GSI-191 for WBN Unit 2. (Section 6.1.1.4)*	TVA response provided in Enclosure 1 of this letter.
C	*TVA should amend the FSAR description of the design and operation of the spent fuel pool cooling and cleanup system in FSAR Section 9.1.3 as proposed in its December 21, 2010, letter to the NRC. (Section 9.1.3)*	TVA response provided in Enclosure 1 of this letter.
D	*TVA should provide information to the NRC staff to demonstrate that PAD 4.0 can conservatively calculate the fuel temperature and other impacted variables, such as stored energy, given the lack of a fuel thermal conductivity degradation*	Will result in a License Condition.

SSER Item No.	SSER Item Description	TVA Status
	model. (Section 4.2.2.1)	
E	*Confirm TVA's change to FSAR Section 10.4.9 to reflect its intention to operate with each CST isolated from the other. (Section 10.4.9)*	TVA response provided in Enclosure 1 of this letter.
F	*TVA should confirm to the NRC staff that testing prior to Unit 2 fuel load has demonstrated that two-way communications is impossible with the Eagle 21 communications interface. (Section 7.2.1.1)*	TVA to answer later.
G	*TVA stated that, "Post modification testing will be performed to verify that the design change corrects the Eagle 21, Rack 2 RTD accuracy issue prior to WBN Unit 2 fuel load. This issue is open pending NRC review of the testing results.*	For NRC Inspection / Review
H	*TVA should provide justification to the staff regarding why different revisions of WCAP-13869 are referenced in WBN Unit 1 and Unit 2. (Section 7.2.1.1)*	TVA response provided in Enclosure 1 of this letter.
I	*TVA should clarify FSAR Section 9.2.5 to add the capability of the UHS to bring the non accident unit to cold shutdown within 72 hours. (SRP Section 9.2.5)*	TVA to answer later.
J	*TVA should confirm, and the NRC staff should verify, that the component cooling booster pumps for Unit 2 are above PMF level. (Section 9.2.2)*	For NRC Inspection / Review
K	*TVA should clarify to the NRC staff how the CSS complies with GDC 5. (Section 9.2.2)*	TVA to answer later.
L	*The WBN Unit 2 RCS vent system is acceptable, pending verification that the RCS vent system is installed. (Section 5.4.5)*	For NRC Inspection / Review
M	*TVA should provide the revised WBN Unit 2 PSI program ASME Class 1, 2, and 3 Supports "Summary Tables," to include numbers of components so that the NRC staff can verify that the numbers meet the reference ASME Code. (Section 3.2.3 of Appendix Z of this SSER)*	TVA to answer later.
N	*TVA should confirm to the staff the replacement of the current Unit 2 clevis insert bolts to the latest design, which uses an X-750 alloy with an HTH process, rolled threads, and a larger radius on the undercut of the cap screw head. (Section 3.9.5)*	TVA response provided in Enclosure 1 of this letter.
O	*Based on its review, the staff asked TVA several questions regarding the ICC instrumentation. TVA responded to the staff questions by letter dated October 26, 2010 (ADAMS Accession No.*	For NRC Inspection / Review

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	ML103020322). The NRC staff has not completed the review of the additional information provided by TVA. The staff will provide its evaluation after completion of that review. (Section 4.4.8)	
P	*The NRC staff will inspect to confirm that TVA has completed the WBN Unit 2 EOPs prior to fuel load. (Section 7.5.3)*	For NRC Inspection / Review
Q	*The NRC staff will verify installation of the acoustic-monitoring system for the power-operated relief valve (PORV) position indication in WBN Unit 2 before fuel load. (Section 7.8.1)*	For NRC Inspection / Review
R	*The NRC staff will verify that the test procedures and qualification testing for auxiliary feedwater initiation and control and flow indication are completed in WBN Unit 2 before fuel load. (Section 7.8.2)*	For NRC Inspection / Review
S	*The NRC staff will verify that the derivative time constant is set to zero in WBN Unit 2 before fuel load. (Section 7.8.3)*	For NRC Inspection / Review