Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-19-110

December 17, 2019

10 CFR 50.90

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

Watts Bar Nuclear Plant, Units 1 and 2
Facility Operating License Nos. NPF-90 and NPF-96
NRC Docket Nos. 50-390 and 50-391

Subject: **Watts Bar Nuclear Plant, Units 1 and 2, Application to Revise Technical Specifications 3.8.1, "AC Sources – Operating" (WBN-TS-18-10)**

References:
1. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 1 - Issuance of Amendment Regarding Alternating Current Sources (TAC No. MF2549)," dated September 29, 2015 (ML15225A094)
2. NRC letter to TVA, "Issuance of Facility Operating License No. NPF-96, Watts Bar Nuclear Plant Unit 2," dated October 22, 2015 (ML15251A587)

In accordance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.90, "Application for amendment of license, construction permit, or early site permit," Tennessee Valley Authority (TVA) is submitting a license amendment request to revise the Watts Bar Nuclear Plant (WBN) Units 1 and 2 Technical Specifications (TS) 3.8.1, "AC Sources – Operating," to delete Surveillance Requirement (SR) 3.8.1.22.

As described in Section 2.0 to the enclosure to this submittal, the Nuclear Regulatory Commission (NRC) issued a license amendment for WBN Unit 1 (Reference 1) to allow the use of Common Station Service Transformer (CSST) A or B as a qualified offsite power source. Similar requirements were also added to the WBN Unit 2 TS as part of the initial licensing of WBN Unit 2 (Reference 2). However, it was identified that the analysis performed in the qualification of CSST A and B as qualified offsite power sources did not meet 10 CFR 50, Appendix A General Design Criterion (GDC) 17 when the unit board is powered from a Unit Service Station Transformer (USST) via the 500 kilovolt (kV) supply and CSST A or B is being used as an alternate for CSST C or D. Specifically, during the fast transfer from the 500 kV supply (USST) to CSST A or B following an event, it is possible that a voltage transient could result in actuation of the degraded voltage relays, causing the offsite power source to be disconnected, which starts the associated diesel generators (DG) to repower the 6.9 kV shutdown boards.

Therefore, the proposed change will remove the requirement in WBN Units 1 and 2 SR 3.8.1.22 to verify the operability of the automatic transfer from a USST to CSST A or B at the associated unit board. The offsite circuit alignment that credits CSST A or B as a qualified power source when the associated 6.9 kV shutdown boards are powered from a USST with automatic transfer to the associated CSST (A or B) at the respective unit boards will no longer be included in the WBN Units 1 and 2 design basis.

The enclosure to this submittal provides a description and evaluation of the proposed technical changes, a regulatory evaluation, and a discussion of environmental considerations. Attachment 1 to the enclosure provides the existing WBN Units 1 and 2 TS pages marked up to show the proposed changes. Attachment 2 to the enclosure provides the final typed WBN Units 1 and 2 TS pages with the proposed changes incorporated. Attachments 3 and 4 to the enclosure provide the respective existing WBN Units 1 and 2 TS Bases pages marked-up to show the proposed changes. Changes to the existing TS Bases are provided for information only and will be implemented under the Technical Specification Bases Control Program. Attachment 5 provides a simplified diagram of the WBN Electrical Distribution System.

TVA determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). In accordance with 10 CFR 50.91, "Notice for Public Comment; State Consultation," TVA is sending a copy of this letter and the enclosure to the Tennessee Department of Environment and Conservation.

TVA requests approval of the proposed license amendment within one year from the date of this submittal and implementation within 30 days from the date of approval.

There are no new regulatory commitments associated with this submittal. Please address any questions regarding this request to Kimberly D. Hulvey, Fleet Licensing Manager, at 423-751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 17th day of December 2019.

Respectfully,

James T. Polickoski
Director, Nuclear Regulatory Affairs

Enclosure

cc: See Page 3

Enclosure:

Evaluation of the Proposed Change

cc (Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Watts Bar Nuclear Plant
NRC Project Manager – Watts Bar Nuclear Plant
Director, Division of Radiological Health - Tennessee State Department of Environment and Conservation

Enclosure

Evaluation of the Proposed Change

Subject: **Application to Revise Watts Bar Nuclear Plant Unit 1 Technical Specifications 3.8.1, "AC Sources – Operating," WBN-TS-18-10**

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1. Proposed TS Changes Mark-Ups for WBN Units 1 and 2
2. Proposed TS Changes (Final Typed) for WBN Units 1 and 2
3. Proposed TS Bases Page Changes (Mark-Ups) for WBN Unit 1 (For Information Only)
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5. Watts Bar Nuclear Plant Electrical Distribution System

1.0 SUMMARY DESCRIPTION

In accordance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.90, “Application for amendment of license, construction permit, or early site permit,” Tennessee Valley Authority (TVA) is requesting a license amendment to the Watts Bar Nuclear Plant (WBN) Units 1 and 2 Technical Specifications (TS). The proposed change will delete WBN Units 1 and 2 TS 3.8.1, “AC Sources – Operating,” Surveillance Requirement (SR) 3.8.1.22.

The proposed change will remove the requirement to verify the operability of the automatic transfer from a Unit Service Station Transformer (USST) to Common Station Service Transformer (CSST) A or B at the associated unit board. The offsite circuit alignment that credits CSST A or B as a qualified power source when the associated 6.9 kilovolt (kV) shutdown boards (SDBDs) are powered from a USST with automatic transfer to the associated CSST (A or B) at the respective unit boards will no longer be included in the WBN Units 1 and 2 design basis.

The allowance to use CSST A or B as a qualified offsite power source when manually aligned to the associated unit board through the maintenance feeder to the associated 6.9 kV SDBDs is being retained.

2.0 DETAILED DESCRIPTION

2.1 BACKGROUND

As detailed in NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplements 22 and 24 (References 1 and 2, respectively), the use of CSSTs A and B as qualified offsite power sources was previously reviewed by the Nuclear Regulatory Commission (NRC) for WBN Unit 2. In Reference 3, the NRC issued a license amendment for WBN Unit 1 to allow the use of CSST A or B as a qualified offsite power source. Similar requirements were also added to the WBN Unit 2 TS as part of the initial licensing of WBN Unit 2 (Reference 4). In Reference 3, the NRC concluded that the existing TS 3.8.1, which allows 72 hours to align an alternate preferred power source to dual-unit operation, is acceptable as it is in alignment with the approved licensing basis. The NRC stated that they reviewed the system capacity, capability, and timely actions required to restore offsite power to safe shutdown boards through CSST A or B and concluded that the proposed amendment to TS 3.8.1 to use CSST A or B as a 10 CFR 50, Appendix A, General Design Criterion (GDC) 17 source during maintenance of CSST C or D to be acceptable.

The NRC further stated that the proposed SRs for automatic and manual actions necessary to connect two offsite power sources to shutdown boards of two units provide assurance that the proposed paths will restore power for safe shutdown of dual units in a timely manner consistent with the WBN design basis. The NRC concluded that TVA addressed the operability of normal and alternate paths, including maintenance requirements. In the event of loss of all the offsite power sources or loss of normal preferred power source, the Class 1E alternating current (AC) buses will be powered from the redundant diesel generators (DGs). The ability to test and use onsite power systems will not be impacted when CSST A or B is aligned as an offsite power source and the transfer capabilities between onsite and offsite power systems are assured by routine surveillances.

Furthermore, the NRC concluded that there was reasonable assurance that the equipment required to safely shut down the operating unit(s) and mitigate the effects of a design-basis accident would remain capable of performing the safety function when the alternate preferred power source is connected to the Class 1E buses of the operating unit(s). When one normal preferred power source circuit through CSST C or D is not available, the safety buses of two operating units have two independent offsite power sources, one normal (CSST C or D) and one alternate (CSST A or B), and meet the intent of GDC 17. The NRC stated that they reviewed TVA's responses provided to clarify the information provided in the license amendment request (LAR) (Reference 5) and subsequent correspondence (References 6, 7, and 8). Based on the review, the NRC staff concluded that there was reasonable assurance that specific requirements GDC 5, GDC 18, 10 CFR 50.36, 10 CFR 50.63, and 10 CFR 50.65, as discussed in the NRC safety evaluation, would continue to be met. Therefore, the NRC found the proposed changes acceptable.

In July and August 2016, the NRC conducted a component design basis inspection (CDBI) at WBN. During the inspection, the inspection team identified an unresolved item (URI) related to the analyses done to evaluate the use of CSST A and B as qualified offsite circuits that satisfy GDC 17. The inspection team requested TVA to provide additional information regarding the voltage drop due to fast transfer of loads from the main generator to CSST A or B.

Subsequently, it was identified that the analysis performed in the qualification of CSST A and B as qualified offsite power sources did not meet GDC 17 when power to the Class 1E 6.9 kV SDBDs is provided from a unit board that is powered from a USST via the 500 kV supply, and CSST A or B is being used as an alternate for CSST C or D. During the fast transfer from the 500 kV supply following an event, it was determined that it is possible that a voltage transient could result in actuation of the degraded voltage relays, causing the offsite power source to be disconnected, which starts the associated DGs to repower the 6.9 kV shutdown boards. This is not in compliance with the GDC 17 requirements for offsite power sources. TVA entered this issue into the corrective action program, verified that this offsite power alignment had not been used at WBN, and took corrective actions to preclude use of this system alignment. Subsequently, TVA reported this inaccurate information to the NRC in accordance with 10 CFR 50.9(b) as documented in NRC Inspection Report (IR) 05000390/2019013 and 05000391/2019013.

Therefore, the alignment of CSST A or B as an alternate offsite power source when the associated unit board and SDBDs are being powered from a USST and a fast transfer to CSST A or B is relied on to provide a qualified offsite circuit is being removed from the WBN design basis.

The allowance to rely on CSST A or B as an alternate offsite power source when manually aligned to the unit board, thus providing qualified offsite power to the safety-related 6.9 kV shutdown boards, is being retained in the WBN design basis, as was approved by the NRC in References 3 and 4.

2.2 DESCRIPTION OF THE PROPOSED CHANGE

The proposed license amendment deletes WBN Units 1 and 2 SR 3.8.1.22, which verifies the operability of the automatic transfer from a USST to CSST A or B on the unit boards.

Attachment 1 to this enclosure provides the existing WBN Units 1 and 2 TS pages marked up to show the proposed changes. Attachment 2 to this enclosure provides the final typed WBN Units 1 and 2 TS pages with the proposed changes incorporated. Attachments 3 and 4 to the enclosure provide the respective existing WBN Units 1 and 2 TS Bases pages marked-up to show the proposed changes.

2.3 REASON FOR THE PROPOSED CHANGE

The alignment of CSST A or B as an offsite power source when the unit board and associated SDBDs are powered from a USST and CSST A or B is automatically transferred onto the board on a unit trip or USST fault does not meet GDC 17. During the fast transfer from the 500 kV supply following an event, it is possible that a voltage transient could result in actuation of the degraded voltage relays, causing the offsite power source to be disconnected, which starts the associated DGs to repower the 6.9 kV shutdown boards. Therefore, TVA is removing this alignment from the WBN design basis.

With the removal of the alignment of CSST A or B as an offsite power source, when the associated unit board and SDBDs are powered from a USST and a fast transfer to CSST A or B is relied on to provide a qualified offsite circuit, there is no longer a need to verify the operability of the fast transfer from the USST to CSST A or B at the unit boards.

3.0 TECHNICAL EVALUATION

3.1 SYSTEM DESCRIPTION

The AC electrical power distribution system is shared between WBN Units 1 and 2 and consists of the offsite power sources and the onsite standby power sources (Train A and Train B DGs). As required by GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

Offsite power is supplied to the 161 kV transformer yard by two dedicated lines from the WBN hydro plant switchyard. From the 161 kV transformer yard, two electrically and physically separated circuits provide AC power, through stepdown CSSTs A, B, C, and D. The Class 1E power system is normally supplied from offsite power through CSSTs C and D. For flexibility, there is also a maintenance feed available to provide an alternate power source from CSSTs A and B to the Class 1E power systems, which can be used when CSST C or D is out of service during any operating mode.

The low voltage side of CSSTs A and B powers non-safety-related 6.9 kV station service buses, which include the 6.9 kV common, unit, and reactor coolant pump boards. CSST A is normally aligned to provide offsite power to 6.9 kV common board A and alternate power to 6.9 kV unit boards 1A, 1C, 2A, and 2C. When CSST D is not available, CSST A can be aligned manually to provide power to train B, 6.9 kV SDBDs 1B-B and 2B-B. CSST B provides offsite power from the secondary Y winding to 6.9 kV common board B and alternate power to 6.9 kV unit boards 1B, 1D, 2B, and 2D. When CSST C is not available, CSST B can be aligned manually to provide power to the Train A 6.9 kV SDBDs 1A-A and 2A-A.

CSST C provides normal offsite power from the secondary Y winding to 6.9 kV SDBD 1A-A and from the secondary X winding to 6.9 kV SDBD 2A-A. In addition, this transformer provides alternate (offsite) power from the secondary X winding to 6.9 kV SDBD 1B-B and from the secondary Y winding to 6.9 kV SDBD 2B-B. CSST D provides normal offsite power from the secondary X winding to 6.9 kV SDBD 1B-B and from the secondary Y winding to 6.9 kV SDBD 2B-B. In addition, this transformer provides alternate (offsite) power from the secondary Y winding to 6.9 kV shutdown board 1A-A from the secondary X winding to 6.9 kV SDBD 2A-A. The four 6.9 kV SDBDs that are arranged electrically into four power trains (two per unit) with two boards associated with each load group in each unit. The balance of Class 1E auxiliary power system is normally aligned to the respective 6.9 kV SDBD load group.

Therefore, each 161 kV line associated with CSST C and D is the normal feed for one train of SDBDs and the alternate feed for the other train of SDBDs. The other transformers (CSST A and B, one at a time) on each line supply power to the 6.9 kV non-safety-related unit and common boards and can provide alternate power the 6.9 kV SDBDs, if they are tied to the unit boards through the maintenance feeder.

The onsite standby power source for each 6.9 kV SDBD is a dedicated DG. DGs 1A-A, 1B-B, 2A-A, and 2B-B are separate and independent and are dedicated to 6.9 kV SDBDs 1A-A, 1B-B, 2A-A, and 2B-B, respectively. Each DG set consists of two diesel engines in tandem driving a common generator. A DG starts automatically on a safety injection (SI) signal (e.g., low pressurizer pressure, high containment pressure, or low steam line pressure signals), a 6.9 kV SDBD degraded voltage, or a loss-of-voltage signal. After a DG has started, it can automatically tie to its respective 6.9 kV SDBD after offsite power is tripped as a consequence of a 6.9 kV SDBD degraded voltage or loss-of-voltage signal, independent of or coincident with an SI signal.

Following the trip of offsite power, a loss-of-voltage signal strips most of the non-permanent loads from the 6.9 kV SDBD. After the DG is tied to the 6.9 kV SDBD, loads are sequentially connected to its respective 6.9 kV SDBD by individual load sequence timers. The DGs are automatically connected to the 6.9 kV SDBDs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a design basis accident (DBA). The required loads needed to recover the unit or maintain it in a safe condition are returned to service in a predetermined sequence in order to prevent overloading the DG in the process.

A simplified diagram of the WBN Electrical Distribution System is provided in Attachment 5.

3.2 EVALUATION

As detailed in NUREG-0847, Supplements 22 and 24 (References 1 and 2, respectively), the use of CSSTs A and B as qualified offsite power sources was previously reviewed by the NRC for WBN Unit 2. As described in Reference 3 and clarified in References 6, 7, and 8, CSSTs A and B were upgraded to allow their use as qualified offsite power sources for the Class 1E systems and components powered from the 6.9 kV SDBDs. Design studies concluded that CSSTs A and B are appropriately sized to carry required balance of plant (BOP) loads, as well as one train of Class 1E loads for each unit during normal and accident conditions provided both CSSTs A and B are in service. The upgrade allows either CSST A or B to provide an alternate offsite power source to the 6.9 kV SDBDs while either CSST C or D is out of service.

Design changes to WBN Units 1 and 2 have removed the allowance to rely on CSST A or B as a qualified offsite power source when the associated unit boards are powered from a USST and the qualified power source (CSST A or B) is automatically connected to the unit board on a unit trip or fault in the USST.

3.3 CONCLUSIONS

The proposed amendment removes SR 3.8.1.22, which verifies the operability of the automatic transfer from a unit board to CSST A or B, when the associated unit board requires normal and alternate power sources. Because design changes to WBN Units 1 and 2 have removed the allowance to rely on CSST A or B as a qualified offsite power source when the associated unit boards are powered from a USST and the qualified power source (CSST A or B) is automatically connected to the unit board on a unit trip or fault in the USST, SR 3.8.1.22 is no longer required to be performed. This change is consistent with the WBN Units 1 and 2 design basis and removes a requirement to verify the operability of a feature that is not relied on when CSST A or B is being used as a qualified offsite power source. Therefore, the proposed change does not alter the conclusions that CSST A or B can be used as a qualified offsite power source when manually aligned through the unit boards to one train of 6.9 kV SDBDs via the maintenance feed breaker.

4.0 REGULATORY EVALUATION

4.1 APPLICABLE REGULATORY REQUIREMENTS AND CRITERIA

In accordance with GDC 17, the purpose of the offsite power system is to provide a source of power for all equipment required to assure that fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. Two offsite power circuits are required to be operational with one available within a few seconds of a loss of coolant accident. The proposed amendment improves the ability of the plant to meet these design requirements.

The proposed changes described in this LAR, do not alter or revise offsite AC power systems at WBN Units 1 and 2.

The AC power systems at WBN Units 1 and 2 are designed to comply with the following applicable regulations, requirements, guidance, and standards:

- GDC 17, "Electric power systems," specifies that an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety.
- GDC 18, "Inspection and testing of electric power systems," specifies that electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features.
- Regulatory Guide (RG) 1.32, Revision 1, "Criteria for Safety-Related Electric Power Systems for Nuclear Plants," describes acceptable designs for the availability of offsite power.
- RG 1.93, Revision 0, "Availability of Electric Power Sources," describes the operating procedures and restrictions with respect to the availability of electric power sources.
- Institute of Electrical and Electronics Engineers (IEEE) Standard 308-1971, "Criteria for Class 1 E Power Systems for Nuclear Power Generating Stations," provides criteria for the determination of Class 1 E power system design features and the requirements for their testing, surveillance, and documentation.

With the implementation of the proposed change, WBN will continue to meet the applicable regulations and requirements.

4.1 PRECEDENT

As previously noted in References 3 and 4, the NRC issued a license amendment for WBN Unit 1 and an Operating License for WBN Unit 2 that allow the use of CSST A or B as a qualified offsite power source. These actions provide precedence for this application. TVA did not identify any applicable regulatory precedent regarding the changes proposed by TVA in this LAR.

4.2 SIGNIFICANT HAZARDS CONSIDERATION

Tennessee Valley Authority (TVA) is requesting an amendment to Facility Operating Licenses NPF-90 and NPF-96 for Watts Bar Nuclear Plant (WBN), Units 1 and 2, respectively. The proposed amendment would modify the WBN Units 1 and 2 Technical Specifications (TS) by removing Surveillance Requirement (SR) 3.8.1.22. SR 3.8.1.22 verifies the operability of the automatic transfer from a unit board to Common Station Service Transformer (CSST) A or B, when the associated unit board requires normal and alternate power sources. Design changes to WBN Units 1 and 2 have removed the allowance to rely on CSST A or B as a qualified offsite power source when the associated unit boards and shutdown boards are powered from a Unit Station Service Transformer (USST) and the qualified power source (CSST A or B) is automatically connected to the unit board on a unit trip or fault in the USST.

The proposed changes are consistent with the WBN Units 1 and 2 design basis and remove a requirement to verify the operability of an automatic feature that is not relied on to use CSST A or B as a qualified offsite power source. The proposed changes do not alter the conclusions that CSST A or B can be used as a qualified offsite power source when manually aligned through the unit boards to one train of safety-related 6.9 kilovolt shutdown boards via the maintenance feed breaker.

TVA evaluated the proposed changes to the TS using the criteria in Section 50.92 to Title 10 of the *Code of Federal Regulations* (10 CFR) and has determined that the proposed changes do not involve a significant hazards consideration. As required by 10 CFR 50.91(a), the TVA analysis of the issue of no significant hazards consideration is presented below

1. *Does the proposed amendment involve a significant increase in the probability or consequence of an accident previously evaluated?*

   Response: No

   The proposed changes described in this TS amendment request do not alter the safety functions of the WBN Offsite Power System. Design calculations document that CSSTs A and B have adequate capacity to supply connected loads, including one train of shutdown boards in allowable alignments and meet the separation requirements for offsite power sources. The proposed changes remove the requirement to verify the capability to automatically transfer from a USST to CSST A or B at the unit boards when using CSST A or B as a qualified offsite power source. The WBN Units 1 and 2 design basis requires that when CSST A or B is used as a qualified offsite power source, the transformer is manually connected to the associated unit boards and does not rely on the automatic transfer from the USST. Implementation of these changes does not

prevent the safety function of any safety-related system, structure, or component; alter, degrade, or prevent action described or assumed in any accident described in the WBN Units 1 and 2 dual-unit Updated Final Safety Analysis Report (UFSAR) from being performed; alter any assumptions previously made in evaluating radiological consequences; or affect the integrity of any fission product barrier.

Therefore, this proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?*

Response: No.

The Alternating Current (AC) electrical power system is not an initiator to any accident sequence analyzed in the UFSAR. Rather, the AC electrical power system supports equipment used to mitigate accidents. The proposed changes to remove the requirement to verify the capability to automatically transfer from a USST to CSST A or B when using CSST A or B as a qualified offsite power source will maintain the same level of equipment performance required for mitigating accidents assumed in the UFSAR, because when CSST A or B is used as a qualified offsite power source, the transformer will be manually connected to the associated unit boards without relying on the automatic transfer from the USST.

Therefore, operation of the facility in accordance with this proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *Does the proposed amendment involve a significant reduction in a margin of safety?*

Response: No.

The proposed changes remove the requirement to verify the capability to automatically transfer from a USST to CSST A or B when using CSST A or B as a qualified offsite power source, because when CSST A or B is used as a qualified offsite power source, the transformer will be manually connected to the associated unit boards without relying on the automatic transfer from the USST. The proposed changes do not alter the permanent plant design, including instrument set points, that is the basis of the assumptions contained in the safety analyses. Therefore, the proposed changes do not prevent any safety-related structures, systems, or components from performing their required functions.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

4.3 CONCLUSIONS

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would not change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. Also, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplement 22, dated February 2011 (ML110390197)
2. NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplement 24, dated September 2011 (ML11277A148)
3. NRC letter to TVA, "Watts Bar Nuclear Plant, Unit 1 - Issuance of Amendment Regarding Alternating Current Sources (TAC No. MF2549)," dated September 29, 2015 (ML15225A094)
4. NRC letter to TVA, “Issuance of Facility Operating License No. NPF-96, Watts Bar Nuclear Plant Unit 2,” dated October 22, 2015 (ML15251A587)
5. TVA letter to NRC, "Application to Modify Watts Bar Nuclear Plant, Unit 1 Technical Specifications Regarding AC Sources - Operating (TS WBN-13-02)," dated August 1, 2013 (ML13220A103)
6. TVA letter to NRC, CNL-14-015, "Response to NRC Request for Additional Information Related to Application to Modify Watts Bar Nuclear Plant, Unit 1 Technical Specifications Related to AC Sources - Operating (TS WBN-13-02)," dated April 21, 2014 (ML14112A341)
7. TVA letter to NRC, CNL-14-107, "Response to NRC Request for Additional Information Related to Application to Modify Watts Bar Nuclear Plant, Unit 1 Technical Specifications Regarding AC Sources - Operating (TS WBN-13-02)," dated January 29, 2015 (ML15041A732)
8. TVA letter to NRC, "Response to NRC Request for Additional Information Related to Application to Modify Watts Bar Nuclear Plant, Unit 1 Technical Specifications Regarding AC Sources - Operating (TS-WBN-13-02) (TAC No. MF2549)," dated June 12, 2015 (ML15195A600)

Attachment 1

Proposed Technical Specification (Markups) for WBN Units 1 and 2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.21	Verify when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 6800 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 6800 V and ≤ 7260 V, and frequency ≥ 59.8 Hz and ≤ 60.1 Hz.	10 years
~~SR 3.8.1.22~~	~~NOTES~~ ~~1. For the 1B and 1C Unit Boards, this Surveillance shall not normally be performed in MODE 1 or 2. However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.~~ ~~2. Transfer capability is only required to be met for 6.9 kV unit boards that require normal and alternate power supplies.~~ ~~Verify automatic transfer of each 6.9 kV Unit Board 1B, 1C, 2B, and 2C power supple from the normal power supply to the alternate power supply.~~	~~18 months~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	Verify during idle operation that any automatic or emergency start signal disables the idle start circuitry and commands the engine to full speed.	18 months
SR 3.8.1.21	Verify when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 6800 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 6800 V and ≤ 7260 V, and frequency ≥ 59.8 Hz and ≤ 60.1 Hz.	10 years
~~SR 3.8.1.22~~	~~NOTES~~ ~~1. For the 2B and 2C Unit Boards, this Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.~~ ~~2. Transfer capability is only required to be met for 6.9kV Unit Boards that require normal and alternate power supplies.~~ ~~Verify automatic transfer of each 6.9kV Unit Board 1B, 1C, 2B and 2C power supply from the normal power supply to the alternate power supply.~~	~~18 months~~

Attachment 2

Proposed Technical Specification Changes (Final Typed) for WBN Units 1 and 2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.21	Verify when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 6800 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 6800 V and ≤ 7260 V, and frequency ≥ 59.8 Hz and ≤ 60.1 Hz.	10 years

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	Verify during idle operation that any automatic or emergency start signal disables the idle start circuitry and commands the engine to full speed.	18 months
SR 3.8.1.21	Verify when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 6800 V and frequency ≥ 58.8 Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage ≥ 6800 V and ≤ 7260 V, and frequency ≥ 59.8 Hz and ≤ 60.1 Hz.	10 years

Attachment 3

Proposed TS Bases Page Changes (Mark-Ups) for WBN Unit 1 (For Information Only)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources-Operating

BASES

BACKGROUND

The plant AC Electrical Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate(s)), and the onsite standby power sources (Train A and Train B diesel generators (DGs)). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The onsite Class 1E AC Distribution System supplies electrical power to four power trains, shared between the two units, with each train powered by an independent Class 1E 6.9 kV shutdown board. Power trains 1A and 2A comprise load group A, and power trains 1B and 2B comprise load Group B. Two DGs associated with one load group can provide all safety related functions to mitigate a loss-of-coolant accident (LOCA) in one unit and safely shutdown the opposite unit. Each 6.9 kV shutdown board has two separate and independent offsite sources of power as well as a dedicated onsite DG source. The A and B train ESF systems each provide for the minimum safety functions necessary to shut down the plant and maintain it in a safe shutdown condition. Power can be supplied to each Class 1E 6.9 kV shutdown board from a normal offsite circuit (either CSST C or D) an alternate offsite circuit (either CSST A, B, C, or D), ~~a maintenance offsite circuit (either CSST A or B),~~ or a DG.

Offsite power is supplied to the Watts Bar 161 kV transformer yard by two dedicated lines from the Watts Bar Hydro Plant switchyard. This is described in more detail in FSAR Section 8 (Ref.2). From the 161 kV transformer yard, two electrically and physically separated circuits provide AC power, through step-down common station service transformers, to the 6.9 kV shutdown boards. The two offsite AC electrical power sources are designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A detailed description of the offsite power network and the circuits to the Class 1E shutdown boards is found in Reference 2.

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network (i.e., Watts Bar Hydro Plant switchyard) to the onsite Class 1E ESF buses (i.e., 6.9 kV shutdown boards).

(continued)

BASES

BACKGROUND (continued)

A single offsite circuit is capable of providing the ESF loads. Two of these circuits are required to meet the Limiting Condition for Operation.

The onsite standby power source for each 6.9 kV shutdown board is a dedicated DG. WBN uses 4 DG sets for Unit 1 operation. These same DGs will be shared for Unit 2 operation. A DG starts automatically on a safety injection (SI) signal (i.e., low pressurizer pressure or high containment pressure signals) or on an 6.9 kV shutdown board degraded voltage or loss-of-voltage signal (refer to LCO 3.3.5, “Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation”). After the DG has started, it will automatically tie to its respective 6.9 kV shutdown board after offsite power is tripped as a consequence of 6.9 kV shutdown board loss-of-voltage or degraded voltage, independent of or coincident with an SI signal. The DGs will also start and operate in the standby mode without tying to the 6.9 kV shutdown board on an SI signal alone. Following the trip of offsite power, a loss-of-voltage signal strips all nonpermanent loads from the 6.9 kV shutdown board. When the DG is tied to the 6.9 kV shutdown board, loads are then sequentially connected to its respective 6.9 kV shutdown board by the automatic sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG by automatic load application.

In the event of a loss of preferred power, the 6.9 kV shutdown boards are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a LOCA.

Certain required plant loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within the required interval (FSAR Table 8.3-3) after the initiating signal is received, all automatic and permanently connected loads needed to recover the plant or maintain it in a safe condition are returned to service.

Ratings for Train 1A, 1B, 2A and 2B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 4400 kW with 10% overload permissible for up to 2 hours in any 24 hour period. The ESF loads that are powered from the 6.9 kV shutdown boards are listed in Reference 2.

The capability is provided to connect a 6.9 kV FLEXS DG to supply power to any of the four 6.9 kV shutdown boards. The 6.9 kV FLEX DG is commercial-grade and not designed to meet Class 1E requirements. The FLEX DG is made available to support extended Completion Times in the event of an inoperable DG. The FLEX DG is made available as a defense-in-depth alternate source of AC power to mitigate a loss of offsite power event. The FLEX DG would remain disconnected from the Class 1E distribution system unless required during a loss of offsite power.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the FSAR, Section 6 (Ref. 4) and Section 15 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the Accident analyses and is based upon meeting the design basis of the plant. This results in maintaining at least two DG's associated with one load group or one offsite circuit OPERABLE during Accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC power; and

b. A worst case single failure.

The AC sources satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two qualified circuits between the Watts Bar Hydro 161 kV switchyard and the onsite Class 1E Electrical Power System and separate and independent DGs for each train ensure availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an anticipated operational occurrence (AOO) or a postulated DBA.

Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the plant.

Each offsite circuit must be capable of maintaining acceptable frequency and voltage, and accepting required loads during an accident, while connected to the 6.9 kV shutdown boards.

Offsite power from the Watts Bar Hydro 161 kV switchyard to the onsite Class 1E distribution system is from two independent immediate access circuits. Each of the two required circuits are routed from the switchyard through a 161 kV transmission line and one of four 161 to 6.9 kV transformers (common station service transformers (CSSTs)) to the onsite Class 1E distribution system. Normally the two required circuits are aligned to power the 6.9 kV shutdown boards through CSST C and CSST D. However, one of the two required circuits may also be aligned to power two shutdown boards in the same load group through either CSST A or CSST B and its associated Unit Boards~~, either~~ directly from the CSST through the Unit Board ~~or by automatic transfer from the Unit Station Service Transformer (USST) to the CSST~~. Use of CSST A or B as an

(continued)

BASES (continued)

LCO (continued)

offsite source requires that CSST A and B both be available and that the associated power and control feeders be in their normal positions to ensure independence. Due to independence limitations~~.~~, CSST A and B cannot be credited for supply of both offsite power sources simultaneously. The medium voltage power system starts at the low-side of the common station service transformers. As noted in Reference 2, the maintenance supply feed from CSST B or A is provided for flexibility when CSST C or D is out of service during any operating mode.

Each required offsite circuit is that combination of power sources described below that are either connected to the Class 1E AC Electrical Power Distribution System. or is available to be connected to the Class 1E AC Electrical Power Distribution System through automatic transfer at the 6.9 kV Shutdown ~~or Unit~~ Boards within a few seconds~~.~~ as required.

The following offsite power configurations meet the requirements of the LCO:

1. Normal Operation (i.e., all 6.9 kV shutdown boards aligned to their normal offsite circuit) - Two offsite circuits consisting of (a) AND (b) (no board transfers required; a loss of either circuit will not prevent the minimum safety functions from being performed);

   a. From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding Y) to 6.9 kV Shutdown Board 1A-A and (winding X) to 6.9 kV Shutdown Board 2A-A; AND

   b. From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B.

2. Alternate Operation (i.e., one or more 6.9 kV shutdown boards aligned to their alternate offsite circuit) – Two offsite circuits consisting of (a) AND (b) AND (c) (as needed) (Note: 6.9 kV shutdown board(s) aligned to normal circuit require an OPERABLE automatic transfer; a loss of either circuit will not prevent the minimum safety functions from being performed);

   a. From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding Y) to 6.9 kV Shutdown Board 1A-A (normal) AND/OR Shutdown Board 2B-B (alternate) and (winding X) to 6.9 kV Shutdown Board 2A-A (normal) AND/OR Shutdown Board 1B-B (alternate);

   b. From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B (normal) AND/OR Shutdown Board 2A-A (alternate) and (winding Y) to 6.9 kV Shutdown Board 2B-B (normal) AND/OR Shutdown Board 1A-A (alternate); AND

   c. An OPERABLE transfer from the normal circuit to the alternate circuit for those 6.9 kV shutdown boards aligned to their normal circuit.

(continued)

BASES (continued)

LCO (continued)

3. ~~Unit Board Operation - Normal Supply (i.e., one offsite circuit includes a unit board supplied by its normal power supply, the USST) - Two offsite circuits consisting of (a) OR (b) (relies on automatic transfer of Unit Board power supply alignment from its normal supply (USST) to its alternate supply (CSST via the Start Bus):~~

~~a. CSST C out-of-service;~~

~~1) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B;~~

~~2) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST B (winding Y) to the 6.9 kV Unit Board 1B and Unit Board 2B (Breakers 1622 & 1632 open);~~

~~3) From Unit Board 1B to 6.9 kV Shutdown Board 1A-A (Breaker 1718 closed);~~

~~4) From Unit Board 2B to 6.9 kV Shutdown Board 2A-A (Breaker 1818 closed); AND~~

~~5) Unit Board 1B and Unit Board 2B normal to alternate automatic transfer circuit OPERABLE.~~

~~b. CSST D out-of-service;~~

~~1) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding X) to 6.9 kV Shutdown Board 1A-A and (winding Y) to 6.9 kV Shutdown Board 2A-A;~~

~~2) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST A (winding Y) to the 6.9 kV Unit Board 1C and Unit Board 2C (Breakers 1524 and 1534 open);~~

~~3) From Unit Board 1C to 6.9 kV Shutdown Board 1B-B (Breaker 1726 closed);~~

~~4) From Unit Board 2C to 6.9 kV Shutdown Board 2B-B (Breaker 1826 closed); AND~~

~~5) Unit Board 1C and Unit Board 2C normal to alternate automatic transfer circuit OPERABLE.~~

(continued)

BASES

LCO (continued)

4) Unit Board Operation - Alternate Supply (i.e., one offsite circuit includes a unit board supplied by its alternate power supply, the CSST via the Start Bus) - Two offsite circuits consisting of (a) OR (b) (no board transfers required):

a. CSST C out-of-service;

1) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B; AND

2) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST B (winding Y) to the 6.9 kV Unit Board 1B and Unit Board 2B (Breakers 1622 and 1632 closed) to 6.9 kV Shutdown Board 1A-A and to 6.9 kV Shutdown Board 2A-A (Breakers 1718 and 1818 closed), respectively.

b. CSST D out-of-service

1) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding X) to 6.9 kV Shutdown Board 1A-A and (winding Y) to 6.9 kV Shutdown Board 2A-A; AND

2) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST A (winding Y) to the 6.9 kV Unit Board 1C and Unit Board 2C (Breakers 1524 and 1534 closed) to 6.9 kV Shutdown Board 1B-B and to 6.9 kV Shutdown Board 2B-B (Breakers 1726 and 1826 closed), respectively.

~~Although providing a qualified circuit using the 6.9 kV maintenance feed is allowed, limit the time when one of the qualified offsite circuits is aligned to a 6.9 kV shutdown board through the maintenance feed to that needed to complete repairs on CSST C or CSST D~~

Note: When using either CSST A or B as a qualified offsite circuit, the CSST (A or B) not in use as a qualified circuit must be available.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Transfer of each 6.9 kV shutdown board power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The 18 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by two Notes. The reason for the first Note is that, during operation with the reactor critical, performance of this SR for the 1A-A or 1B-B Shutdown Board could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.1.8 (continued)

Note 2 specifies that the transfer capability is only required to be met when one or more 6.9 kV shutdown boards require normal and alternate power supplies. When all the 6.9 kV shutdown boards are supplied power by their normal power supply the alternate power supply is not required. When one or more of the 6.9 kV shutdown boards are supplied power from their alternate power supply the automatic transfer for those 6.9 kV shutdown boards required to transfer from their normal to alternate power supply is required to be OPERABLE. If one or more of the 6.9 kV shutdown boards are aligned to its alternate source (CSST A, B, C, or ~~CSST~~ D) this SR verifies that at least two 6.9 kV shutdown boards in the same load group will be powered from an offsite circuit if a fault occurs on either circuit.

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. The largest single load for each DG is the essential raw cooling water pump at 800 HP. This Surveillance may be accomplished by: 1) tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post accident load while paralleled to offsite power or while solely supplying the bus, or 2) tripping its associated single largest post accident load with the DG solely supplying the bus. As required by Regulatory Guide 1.9, C1.4 (Ref. 3), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

The time and voltage tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and maximum transient frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.9 (Ref. 3).

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.21 (continued)

The Frequency for accelerated testing is 7 days, but no less than 24 hours. Tests conducted at intervals of less than 24 hours may be credited for compliance with Required Actions. However, for the purpose of re-establishing the normal 31-day Frequency, a successful test at an interval of less than 24 hours should be considered an invalid test and not count towards the 7 consecutive failure free starts, and the consecutive test count is not reset.

A test interval in excess of 7 days (or 31 days as appropriate) constitutes a failure to meet the SRs and results in the associated DG being declared inoperable. It does not, however, constitute a valid test or failure of the DG, and any consecutive test count is not reset.

SR 3.8.1.22

Transfer of the 6.9 kV Unit Boards 1B, 1C, 2B, and 2C power supply from the normal power supply (USST) to the alternate power supply (CSST via the 6.9 kV Start Bus) demonstrates the OPERABILITY of the maintenance offsite circuit to power the shutdown loads when the shutdown board is powered from the USST. The 18-month Frequency of the Surveillance is based on engineering judgment, taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

This SR is modified by two Notes. The reason for the first Note is that, during operation with the reactor critical, performance of this SR for the 1B or 1C Unit Board could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

SURVEILLANCE REQUIREMENTS

SR 3.8.1.22 (continued)

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

Note 2 specifies that transfer capability is only required to be met for 6.9 kV Unit Boards that require normal and alternate power supplies. If the unit board is not a part of the required qualified circuit or the qualified circuit is powered from the CSST through the unit board to the 6.9 kV shutdown board, the automatic transfer is not required. Because reliance on the automatic transfer from the

BASES

~~normal to alternate power supplies at the unit board may not meet GDC 17 requirements under all conditions, the 6.9 kV shutdown board will only be connected to the 6.9 kV unit board after the unit board has been manually transferred to its alternate power supply (CSST A or B). Therefore, the 6.9 kV unit board will only require the alternate power supply when it is a part of the qualified offsite circuit and performance of SR 3.8.1.22 will not be required to verify the operability of the offsite circuit.~~

REFERENCES

1. Title 10, Code of Federal Regulations, Part 50, Appendix A, General Design Criterion (GDC) 17, “Electrical Power Systems.”

2. Watts Bar FSAR, Section 8.2, “Offsite Power System,” and Tables 8.3-1 to 8.3-3, “Safety-Related Standby Power Sources and Distribution Boards,” “Shutdown Board Loads Automatically Tripped Following a Loss of Nuclear Unit and Preferred Power,” and “Diesel Generator Load Sequentially Applied Following a Loss of Nuclear Unit and Preferred Power.”

3. Regulatory Guide 1.9, Rev. 3, “Selection, Design, Qualification and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants,” July 1993.

4. Watts Bar FSAR Section 6, “Engineered Safety Features.”

5. Watts Bar FSAR, Section 15.4, “Condition IV-Limiting Faults.”

6. Regulatory Guide 1.93, Rev. 0, “Availability of Electric Power Sources,” December 1974.

7. Generic Letter 84-15, “Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability,” July 2, 1984.

8. Title 10, Code of Federal Regulations, Part 50, Appendix A, GDC 18, “Inspection and Testing of Electric Power Systems.”

9. Regulatory Guide 1.137, Rev. 1, “Fuel Oil Systems for Standby Diesel Generators,” October 1979.

10. Watts Bar Drawing 1-47W605-242, “Electrical Tech Spec Compliance Tables.

11. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," dated July 2, 1984.

Bases Table 3.8.1-2
TS Action or Surveillance Requirement (SR) Contingency Actions

	Contingency Actions to be Implemented	Applicable TS Action or SR	Applicable Modes
1.	Verify that the offsite power system is stable. This action will establish that the offsite power system is within single-contingency limits and will remain stable upon the loss of any single component supporting the system. If a grid stability problem exists, the planned DG outage will not be scheduled.	SR 3.8.1.14 Action B.5	1, 2 1, 2, 3, 4
2.	Verify that no adverse weather conditions are expected during the outage period. The planned DG outage will be postponed if inclement weather (such as severe thunderstorms or heavy snowfall) is projected.	SR 3.8.1.14 Action B.5	1, 2 1, 2, 3, 4
3.	Do not remove from service the ventilation systems for the 6.9 kV shutdown boardrooms, the elevation 772 transformer rooms, or the 480-volt shutdown board rooms, concurrently with the DG, or implement appropriate compensatory measures.	Action B.5	1, 2, 3, 4
4.	Do not remove the reactor trip beakers from service concurrently with planned DG outage maintenance.	Action B.5	1, 2, 3, 4
5.	D not remove the turbine-driven auxiliary feedwater (AFW) pump from service concurrently with a Unit 1 DG outage.	Action B.5	1, 2, 3, 4
6.	Do not remove the AFW level control valves to the steam generators from service concurrently with a Unit 1 DG outage	Action B.5	1, 2, 3, 4
7.	Do not remove the opposite train residual heat remove (RHR) pump from service concurrently with a Unit 1 DG outage.	Action B.5	1, 2, 3, 4

Attachment 4

Proposed TS Bases Page Changes (Mark-Ups) for WBN Unit 2 (For Information Only)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources - Operating

BASES

BACKGROUND

The plant AC Electrical Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate(s)), and the onsite standby power sources (Train A and Train B diesel generators (DGs)). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The onsite Class 1E AC Distribution System supplies electrical power to four power trains, shared between the two units, with each train powered by an independent Class 1E 6.9 kV shutdown board. Power trains 1A and 2A comprise load group A, and power trains 1B and 2B comprise load group B. Two DGs associated with one load group can provide all safety related functions to mitigate a loss-of-coolant accident (LOCA) in one unit and safely shutdown the opposite unit. Each 6.9 kV shutdown board has two separate and independent offsite sources of power as well as a dedicated onsite DG source. The A and B train ESF systems each provide for the minimum safety functions necessary to shut down the plant and maintain it in a safe shutdown condition. Power can be supplied to each Class 1E 6.9 kV shutdown board from a normal offsite circuit (either CSST C or D), an alternate offsite circuit (either CSST A, B, C or D), ~~a maintenance offsite circuit (either CSST A or B),~~ or a DG.

Offsite power is supplied to the Watts Bar 161 kV transformer yard by two dedicated lines from the Watts Bar Hydro Plant switchyard. This is described in more detail in FSAR, Section 8 (Ref. 2). From the 161 kV transformer yard, two electrically and physically separated circuits provide AC power, through step-down common station service transformers, to the 6.9 kV shutdown boards. The two offsite AC electrical power sources are designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A detailed description of the offsite power network and the circuits to the Class 1E shutdown boards is found in Reference 2.

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network (i.e., Watts Bar Hydro Plant switchyard) to the onsite Class 1E ESF buses (i.e., 6.9 kV shutdown boards).

A single offsite circuit is capable of providing the ESF loads. Two of these circuits are required to meet the Limiting Condition for Operation.

(continued)

BASES

BACKGROUND (continued)

The onsite standby power source for each 6.9 kV shutdown board is a dedicated DG. WBN uses 4 DG sets for Unit 2 operation. These same DGs are shared for Unit 1 operation. A DG starts automatically on a safety injection (SI) signal (i.e., low pressurizer pressure or high containment pressure signals) or on a 6.9 kV shutdown board degraded voltage or loss-of-voltage signal (Refer to LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation."). After the DG has started, it will automatically tie to its respective 6.9 kV shutdown board after offsite power is tripped as a consequence of 6.9 kV shutdown board loss-of-voltage or degraded voltage, independent of or coincident with an SI signal. The DGs will also start and operate in the standby mode without tying to the 6.9 kV shutdown board on an SI signal alone. Following the trip of offsite power, a loss-of-voltage signal strips all nonpermanent loads from the 6.9 kV shutdown board. When the DG is tied to the 6.9 kV shutdown board, loads are then sequentially connected to its respective 6.9 kV shutdown board by the automatic sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG by automatic load application.

In the event of a loss of preferred power, the 6.9 kV shutdown boards are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a LOCA.

Certain required plant loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within the required interval (FSAR Table 8.3-3) after the initiating signal is received, all automatic and permanently connected loads needed to recover the plant or maintain it in a safe condition are returned to service.

Ratings for Train 1A, 1B, 2A and 2B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 4400 kW with 10% overload permissible for up to 2 hours in any 24 hour period. The ESF loads that are powered from the 6.9 kV shutdown boards are listed in Reference 2.

The capability is provided to connect a 6.9 kV FLEXS DG to supply power to any of the four 6.9 kV shutdown boards. The 6.9 kV FLEX DG is commercial-grade and not designed to meet Class 1E requirements. The FLEX DG is made available to support extended Completion Times in the event of an inoperable DG. The FLEX DG is made available as a defense-in-depth alternate source of AC power to mitigate a loss of offsite power event. The FLEX DG would remain disconnected from the Class 1E distribution system unless required during a loss of offsite power.

LCO (continued)

to power two shutdown boards in the same load group through either CSST A or CSST B and its associated Unit Boards~~, either~~ directly from the CSST through the Unit Board ~~or by automatic transfer from the Unit Station Service Transformer (USST) to the CSST~~. Use of CSST A or B as an offsite source requires that CSST A and B both be available and that the associated power and control feeders be in their normal positions to ensure independence. Due to independence limitations, CSST A and B cannot be credited for supply of both the offsite power sources simultaneously. The medium voltage power system starts at the low-side of the common station service transformers. As noted in Reference 2, the maintenance supply feed from CSST B or A is provided for flexibility when CSST C or D is out of service during any operating mode.

Each required offsite circuit is that combination of power sources described below that are either connected to the Class 1E AC Electrical Power Distribution System, or is available to be connected to the Class 1E AC Electrical Power Distribution System through automatic transfer at the 6.9 kV Shutdown ~~or Unit~~ Boards within a few seconds as required.

The following offsite power configurations meet the requirements of the LCO:

1. Normal Operation (i.e., all 6.9 kV shutdown boards aligned to their normal offsite circuit) – Two offsite circuits consisting of (a) AND (b) (no board transfers required; a loss of either circuit will not prevent the minimum safety functions from being performed);

   a. From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding Y) to 6.9 kV Shutdown Board 1A-A and (winding X) to 6.9 kV Shutdown Board 2A-A: AND

   b. From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B.

2. Alternate Operation (i.e., one or more 6.9 kV shutdown boards aligned to their alternate offsite circuit) – Two offsite circuits consisting of (a) AND (b) AND (c) (as needed) (Note: 6.9 kV shutdown board(s) aligned to normal circuit require an OPERABLE automatic transfer; a loss of either circuit will not prevent the minimum safety functions from being performed);

   a. From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding Y) to 6.9 kV Shutdown Board 1A-A (normal) AND/OR Shutdown Board 2B-B (alternate) and (winding X) to 6.9 kV Shutdown Board 2A-A (normal) AND/OR Shutdown Board 1B-B (alternate);

(continued)

LCO (continued)

b. From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B (normal) AND/OR Shutdown Board 2A-A (alternate) and (winding Y) to 6.9 kV Shutdown Board 2B-B (normal) AND/OR Shutdown Board 1A-A (alternate); AND

c. An OPERABLE transfer from the normal circuit to the alternate circuit for those 6.9 kV shutdown boards aligned to their normal circuit.

~~3. Unit Board Operation – Normal Supply (i.e., one offsite circuit includes a unit board supplied by its normal power supply, the USST) – Two offsite circuits consisting of (a) OR (b) (relies on automatic transfer of Unit Board power supply alignment from its normal supply (USST) to its alternate supply (CSST via Start Bus);~~

~~a. CSST C out-of-service;~~

~~1) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B;~~

~~2) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST B (winding Y) to 6.9 kV Unit Board 1B and 6.9 kV Unit Board 2B (Breakers 1622 and 1632 open);~~

~~3) From Unit Board 1B to 6.9 kV Shutdown Board 1A-A (Breaker 1718 closed); AND~~

~~4) From Unit Board 2B to 6.9 kV Shutdown Board 2A-A (Breaker 1818 closed); AND~~

~~5) Unit Board 1B and Unit Board 2B normal to alternate automatic transfer circuit OPERABLE.~~

~~b. CSST D out-of-service;~~

~~1) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding X) to 6.9 kV Shutdown Board 1A-A and (winding Y) to 6.9 kV Shutdown Board 2A-A;~~

(continued)

~~LCO (continued)~~

~~2) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST A (winding Y) to 6.9 kV Unit Board 1C and 6.9 kV Unit Board 2C (Breakers 1524 and 1534 open);~~

~~3) From 6.9 kV Unit Board 1C to 6.9 kV Shutdown Board 1B-B (Breaker 1726 closed); AND~~

~~4) From Unit Board 2C to 6.9 kV Shutdown Board 2B-B (Breaker 1826 closed); AND~~

~~5) Unit Board 1C and Unit Board 2C normal to alternate automatic transfer circuit OPERABLE.~~

43. Unit Board Operation – Alternate Supply (i.e., one offsite circuit includes a unit board supplied by its alternate power supply, the CSST via the Start Bus) – Two offsite circuits consisting of (a) OR (b) (no board transfers required);

a. CSST C out-of-service;

1) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B; AND

2) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST B (winding Y) to 6.9 kV Unit Board 1B and 6.9 kV Unit Board 2B (Breakers 1622 and 1632 closed) to 6.9 kV Shutdown Board 1A-A and 6.9 kV Shutdown Board 2A-A (Breakers 1718 and 1818 closed), respectively.

b. CSST D out-of-service;

1) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding X) to 6.9 kV Shutdown Board 1A-A and (winding Y) to 6.9 kV Shutdown Board 2A-A; AND

2) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST A (winding Y) to 6.9 kV Unit Board 1C and 6.9 kV Unit Board 2C (Breakers 1524 and 1534 closed) to 6.9 kV Shutdown Board 1B-B and 6.9 kV Shutdown Board 2B-B (Breakers 1726 and 1826 closed), respectively.

Note: When using either CSST A or B as a qualified offsite circuit, the CSST (A or B) not in use as a qualified circuit must be available.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.8 (continued)

1.) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2.) Post-corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

Note 2 specifies that the transfer capability is only required to be met when one or more 6.9 kV shutdown boards require normal and alternate power supplies. When all the 6.9 kV shutdown boards are supplied power by their normal power supply, the alternate supply is not required. When one or more of the 6.9 kV shutdown boards are supplied power from their alternate power supply, the automatic transfer for those 6.9 kV shutdown boards required to transfer from their normal to alternate power supply is required to be OPERABLE. If one or more of the 6.9 kV shutdown boards are aligned to its alternate source (CSST A, B, C or ~~CSST~~ D), this SR verifies that at least two 6.9 kV shutdown boards in the same load group will be powered from an offsite circuit if a fault occurs on either circuit.

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. The largest single load for each DG is the essential raw cooling water pump at 800 HP. This Surveillance may be accomplished by: 1) tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power or while solely supplying the bus, or 2) tripping its associated single largest post accident load with the DG solely supplying the bus. As required by Regulatory Guide 1.9, C1.4 (Ref. 3), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.20

This SR verifies that DG availability is not compromised by the idle start circuitry, when in the idle mode of operation, and that an automatic or emergency start signal will disable the idle start circuitry and command the engine to go to full speed. The 18 month frequency is consistent with the expected fuel cycle lengths and is considered sufficient to detect any degradation of the idle start circuitry.

SR 3.8.1.21

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously. The minimum voltage and frequency stated in the SR are those necessary to ensure the DG can accept DBA loading while maintaining acceptable voltage and frequency levels. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not dampened out by load application. This period may extend beyond the 10 seconds acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR, WBN will monitor and trend the actual time to reach steady state operation as a means of ensuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1.

For the purpose of this testing, the DGs shall be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. The DG engines for WBN have an oil circulation and soakback system that operates continuously to preclude the need for a prelube and warmup when a DG is started from standby.

~~SR 3.8.1.22~~

~~Transfer of the 6.9 kV Unit Boards 1B, 1C, 2B, and 2C power supply from the normal supply (USST) to the alternate power supply (CSST via the 6.9 kV Start bus) demonstrates the OPERABILITY of the maintenance offsite circuit to power the shutdown loads when the shutdown board is powered from the USST. The 18-month Frequency of Surveillance is based on engineering judgment, taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

18-month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

This SR is modified by two Notes. The reason for the first Note is that during operation with the reactor critical, performance of this SR for the 1B or 1C Unit Board could cause perturbations to the electrical distribution systems that could challenge continued steady state operation, and as a result, plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

Note 2 specifies that transfer capability is only required to be met for 6.9 kV Unit Boards that require normal and alternate power supplies. If the unit board is not a part of the required qualified circuit or the qualified circuit is powered from the CSST through the unit board to the 6.9 kV shutdown board, the automatic transfer is not required. Because reliance on the automatic transfer from the normal to alternate power supplies at the unit board may not meet GDC 17 requirements under all conditions, the 6.9 kV shutdown board will only be connected to the 6.9 kV unit board after the unit board has been manually transferred to its alternate power supply (CSST A or B). Therefore, the 6.9 kV unit board will only require the alternate power supply when it is a part of the qualified offsite circuit and performance of SR 3.8.1.22 will not be required to verify the operability of the offsite circuit.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

Diesel Generator Test Schedule

The DG test schedule (Table 3.8.1-1) implements the recommendations of Revision 3 to Regulatory Guide 1.9 (Ref. 3). The purpose of this test schedule is to provide timely test data to establish a confidence level associated with the goal to maintain DG reliability > 0.975 per demand.

According to Regulatory Guide 1.9, Revision 3 (Ref. 3), each DG should be tested at least once every 31 days. Whenever a DG has experienced 4 or more valid failures in the last 25 valid tests, the maximum time between tests is reduced to 7 days. Four failures in 25 valid tests is a failure rate of 0.16, or the threshold of acceptable DG performance, and hence may be an early indication of the degradation of DG reliability. When considered in the light of a long history of tests; however, 4 failures in the last 25 valid tests may only be a statistically probable distribution of random events. Increasing the test Frequency will allow for a more timely accumulation of additional test data upon which to base judgment of the reliability of the DG. The increased test Frequency must be maintained until seven consecutive, failure free tests have been performed.

The Frequency for accelerated testing is 7 days, but no less than 24 hours. Tests conducted at intervals of less than 24 hours may be credited for compliance with Required Actions. However, for the purpose of re-establishing the normal 31 day Frequency, a successful test at an interval of less than 24 hours should be considered an invalid test and not count towards the 7 consecutive failure free starts, and the consecutive test count is not reset.

A test interval in excess of 7 days (or 31 days as appropriate) constitutes a failure to meet the SRs and results in the associated DG being declared inoperable. It does not, however, constitute a valid test or failure of the DG, and any consecutive test count is not reset.

REFERENCES

1. Title 10, Code of Federal Regulations, Part 50, Appendix A, General Design Criterion (GDC) 17, “Electrical Power Systems.”

2. Watts Bar FSAR, Section 8.2, “Offsite Power System,” and Tables 8.3-1 to 8.3-3, “Safety-Related Standby (Onsite) Power Sources and Distribution Boards,” “Shutdown Board Loads Automatically Tripped Following a Loss of Nuclear Unit and Preferred (Offsite) Power,” and “Diesel Generator Load Sequentially Applied Following a Loss of Nuclear Unit and Preferred (Offsite) Power.”

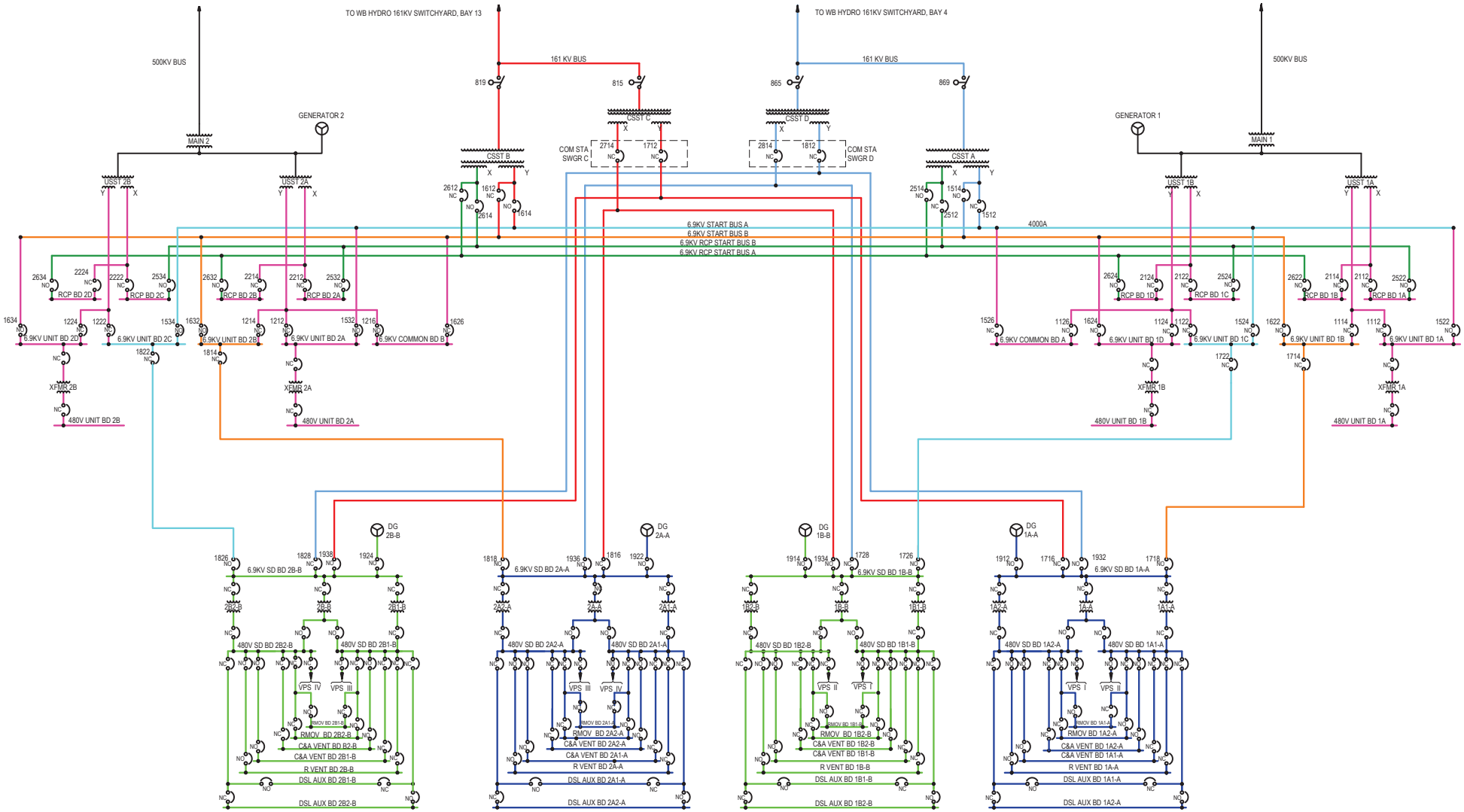
(continued)

Bases Table 3.8.1-2
TS Action or Surveillance Requirement (SR) Contingency Actions

	Contingency Actions to be Implemented	Applicable TS Action or SR	Applicable Modes
1.	Verify that the offsite power system is stable. This action will establish that the offsite power system is within single-contingency limits and will remain stable upon the loss of any single component supporting the system. If a grid stability problem exists, the planned DG outage will not be scheduled.	SR 3.8.1.14 Action B.5	1, 2 1, 2, 3, 4
2.	Verify that no adverse weather conditions are expected during the outage period. The planned DG outage will be postponed if inclement weather (such as severe thunderstorms or heavy snowfall) is projected.	SR 3.8.1.14 Action B.5	1, 2 1, 2, 3, 4
3.	Do not remove from service the ventilation systems for the 6.9 kV shutdown boardrooms, the elevation 772 transformer rooms, or the 480-volt shutdown board rooms, concurrently with the DG, or implement appropriate compensatory measures.	Action B.5	1, 2, 3, 4
4.	Do not remove the reactor trip beakers from service concurrently with planned DG outage maintenance.	Action B.5	1, 2, 3, 4
5.	Do not remove the turbine-driven auxiliary feedwater (AFW) pump from service concurrently with a Unit 2 DG outage.	Action B.5	1, 2, 3, 4
6.	Do not remove the AFW level control valves to the steam generators from service concurrently with a Unit 2 DG outage	Action B.5	1, 2, 3, 4
7.	Do not remove the opposite train residual heat remove (RHR) pump from service concurrently with a Unit 2 DG outage.	Action B.5	1, 2, 3, 4

Attachment 5

Watts Bar Nuclear Plant Electrical Distribution System



Watts Bar Nuclear Plant Electrical Distribution System