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10 CFR 50.90

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

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NPF-90
NRC Docket No. 50-390

Subject: **Application to Modify Watts Bar Nuclear Plant, Unit 1, Technical Specifications in Support of Watts Bar Nuclear Plant, Unit 2, Testing and Operation (TS-WBN-11-02)**

In accordance with the provisions of 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," the Tennessee Valley Authority (TVA) is submitting a request for an amendment to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant (WBN), Unit 1.

This license amendment request seeks to amend the WBN, Unit 1, Technical Specifications (TS) to permit performance of the WBN, Unit 2, integrated safeguards test without requiring WBN, Unit 1, be shut down. In addition, the proposed changes will be necessary following the issuance of an operating license for WBN, Unit 2, to permit performance of the affected surveillance requirements without requiring both WBN units to be shutdown.

The proposed change modifies Surveillance Requirement (SR) Notes associated with SR 3.8.1.8, SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.13, SR 3.8.1.16, SR 3.8.1.18, and SR 3.8.1.19 to allow performance of the Surveillances on Unit 2 6.9 kV shutdown boards and associated diesel generators while Unit 1 is operating in MODES 1, 2, 3, or 4.

The enclosure provides a description of the proposed changes, technical evaluation of the proposed changes, regulatory evaluation, and a discussion of environmental considerations. Attachments 1 and 2 to the enclosure provide the existing TS and Bases pages marked-up to show the proposed changes. Attachments 3 and 4 to the enclosure provide the existing TS and Bases pages retyped to show the proposed

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changes. Attachment 5 to the enclosure provides a simplified diagram of the WBN AC Electrical Distribution System.

TVA requests approval of this amendment in time to allow performance of the WBN, Unit 2, integrated safeguards test without requiring shutdown of WBN, Unit 1. TVA will notify the NRC when the WBN, Unit 2, integrated safeguards test is planned to be performed.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

The WBN Plant Operations Review Committee and the WBN Nuclear Safety Review Board have reviewed this proposed change and determined that operation of WBN in accordance with the proposed change will not endanger the health and safety of the public.

Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and the enclosure to the Tennessee Department of Environment and Conservation.

There are no regulatory commitments associated with this submittal. Please address any questions regarding this request to Joe Shea at 423-751-6887.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 10th day of August 2011.

Respectfully,

R. M. Krich

Enclosure:
Evaluation of Proposed Change

cc (Enclosure):

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

ENCLOSURE

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT
UNIT 1

EVALUATION OF PROPOSED CHANGE

Subject: **Application to Modify Watts Bar Nuclear Plant, Unit 1, Technical Specifications in Support of Watts Bar Nuclear Plant, Unit 2, Testing and Operation (TS-WBN-11-02)**

ATTACHMENTS

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Appendix A of Facility Operating License NPF-90 for Watts Bar Nuclear Plant (WBN), Unit 1, Technical Specification (TS) 3.8.1, "AC Sources – Operating."

The Technical Specifications include Surveillance Requirements (SRs) that require the performance of testing to confirm OPERABILITY of AC sources. Testing, monitoring and inspection per these SRs are required to be performed on a periodic basis. Testing per some of the applicable SRs can be performed during any plant MODE. However, many of these SRs contain the provision, in the form of a Note included in each SR, that the Surveillance is not to be performed during certain plant MODES. The proposed changes would modify such MODE restrictions by revising the Note associated with each applicable SR to allow the Surveillance to be performed on the WBN Unit 2 shutdown boards and diesel generators (DGs) during currently prohibited MODES.

Specifically, the MODE 1 and 2 restrictions currently specified for the following SRs would be modified: SR 3.8.1.8 (automatic and manual transfer capability of offsite circuits test); SR 3.8.1.9 (single largest load reject test); SR 3.8.1.10 (full load rejection test); and SR 3.8.1.13 (protective-trip bypass test). The changes would allow these Surveillances to be performed periodically on Unit 2 Shutdown Boards and DGs while Unit 1 is in MODE 1 or 2.

Additionally, the MODE 1, 2, 3, and 4 restrictions currently specified for the following SRs would be modified: SR 3.8.1.11 (loss of offsite power (LOOP) test); SR 3.8.1.16 (synchronizing test); SR 3.8.1.18 (load sequencing test); and SR 3.8.1.19 (safety injection (SI) signal with LOOP test). The changes would allow these Surveillances to be performed periodically on Unit 2 DGs while Unit 1 is in MODE 1, 2, 3, or 4.

The exact changes to be made to the Technical Specifications are described as follows.

2.0 DETAILED DESCRIPTION

2.1 Proposed Changes

The following changes are proposed in order to remove the MODE 1 and 2 Surveillance testing restrictions for SRs 3.8.1.8, 3.8.1.9, 3.8.1.10, and 3.8.1.13, for Unit 2. The changes would be effected by revising each applicable Surveillance Note to only apply to the Unit 1 shutdown boards and DGs, as follows:

- SR 3.8.1.8 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1 or 2."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For the 1A-A and 1B-B Shutdown Boards, this Surveillance shall not be performed in MODE 1 or 2."

- SR 3.8.1.9 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1 or 2."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1 or 2."

- SR 3.8.1.10 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1 or 2."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1 or 2."

- SR 3.8.1.13 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1 or 2."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1 or 2."

The above changes, if approved, will allow these Surveillances to be performed on Unit 2 while Unit 1 is in MODE 1 or 2.

The following changes are proposed in order to remove the MODE 1, 2, 3, and 4 Surveillance testing restrictions for SRs 3.8.1.11, 3.8.1.16, 3.8.1.18, and 3.8.1.19, for Unit 2 DGs. The changes would be effected by revising each applicable Surveillance Note to only apply to Unit 1, as follows:

- SR 3.8.1.11 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1, 2, 3, or 4."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4."

- SR 3.8.1.16 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1, 2, 3, or 4."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4."

- SR 3.8.1.18 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1, 2, 3, or 4."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4."

- SR 3.8.1.19 currently contains the following Note, in part:

  "This Surveillance shall not be performed in MODE 1, 2, 3, or 4."

  For the proposed change to this SR, this sentence of the Note would be revised to:

  "For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4."

The above changes, if approved, will allow these Surveillances to be performed on Unit 2 while Unit 1 is in MODE 1, 2, 3, or 4.

The specified frequency for all of the above SRs is 18 months.

2.2 Need for Proposed Changes

When WBN Unit 1 was granted an operating license in 1996, WBN Unit 2 was not complete and completion of Unit 2 was not contemplated in any committed time frame. However, substantial portions of the site were completed, consistent with the original design of the site as a two-unit facility. The onsite power system, including DGs and supporting equipment were completed as designed for a two-unit site. In light of the current plan to complete and start up WBN Unit 2, TVA evaluated the Technical Specifications to ensure they could still be performed without requiring both units to shutdown. TVA determined that, based on the existing operating mode restrictions contained in the existing TS 3.8.1 SR Notes, it would not be possible to perform the affected SRs without requiring both units to be shut down by TS.

The proposed changes will allow performance of the pre-operational integrated safeguards test of Unit 2 with Unit 1 in MODE 1, 2, 3, or 4. After Unit 2 is granted an Operating License, the proposed changes to the Unit 1 Technical Specifications will allow periodic performance of the Surveillances on Unit 2 in MODE 5 or 6 with Unit 1 in MODE 1, 2, 3, or 4.

This approach is similar to changes made to the Technical Specifications for Palo Verde Nuclear Generating Station, Units 1, 2 and 3 that were approved in the NRC Safety Evaluation dated September 29, 2005. However, removal of the SR Note MODE restriction for WBN Unit 2 (in MODE 5 or 6) can be applied to additional SRs, as testing of a WBN Unit 2 DGs on a Loss of Offsite Power (LOOP) and/or Engineered Safety Feature (ESF) actuation signal does not result in a start of a WBN Unit 1 DG, nor actuation of a WBN Unit 1 ESF system.

3.0 TECHNICAL EVALUATION

TVA performed an in-depth technical evaluation of the proposed changes as discussed below. Section 3.1 contains a description of the affected systems. Section 3.2 contains evaluations of each proposed TS change. Section 3.3 contains information related to the integrated safeguards test for WBN Unit 2. Section 3.4 contains a discussion on the risk evaluation performed for the proposed changes.

3.1 System Description

A diagram of the WBN 6.9 kV – 480 VAC Electrical Distribution System is provided in Attachment 5 to this enclosure.

The WBN AC Electrical Power Distribution System 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, 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 shut down 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.

Offsite power is supplied to the Watts Bar 161 kV transformer yard by two dedicated lines from the Watts Bar Hydro Plant switchyard. From the 161 kV transformer yard, two electrically and physically separated circuits provide AC power, through step-down common station service transformers (CSSTs), 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.

The 6.9kV shutdown boards are provided with loss-of-voltage and degraded-voltage relays that initiate transfer from the normal supply, to the standby (DG) power supply. If the standby supply is paralleled with one of the offsite supplies for testing, loss of the standby supply would cause reverse power relays to trip the standby circuit breaker.

The onsite standby power source for each 6.9 kV shutdown board is a dedicated DG. A DG starts automatically on a safety injection (SI) signal or on a 6.9 kV shutdown board degraded voltage or loss-of-voltage. 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 non-permanent 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.

For a loss of offsite power during DG testing, the DG will switch to the emergency mode of operation with one exception. The DG will remain in the testing mode if the 6.9kV shutdown board's offsite power feed is through the alternate feeder. In this case, DG overcurrent relays are active to prevent the DG from being overloaded. If an accident signal is initiated during testing of the standby supply, the standby breaker is tripped and the emergency loads are automatically energized by the offsite power supply. Should a LOCA and a loss of offsite power occur when a DG is paralleled with the grid under test, its 6.9kV shutdown board standby and supply breakers are tripped, load shedding occurs and the DG sequencer will load the accident loads. Only one DG will be in the test mode (i.e., operated in parallel with the offsite power supply) at any given time unless the unit is in cold shutdown or not fueled; then, both diesels of the same train may be in test. Therefore, loss of any onsite power generation will not prevent the distribution system from being powered from the offsite circuits.

Overcurrent relaying and loss-of-voltage relaying for the shutdown boards are coordinated so that a faulted or overloaded bus will not be transferred from one preferred power circuit to another because of depressed voltage resulting from the fault or overload. For the range of grid conditions identified as acceptable, loss of power from one offsite power circuit, whether from failure at the transmission grid interface, failure of any part of the preferred power circuit itself, or failure of part of the onsite distribution system, will not cause loss or degradation of the other offsite power circuit. The CSST trips are initiated by any transformer or line failure relay such as fault-pressure, transformer-overcurrent, ground-current, line-protection, or differential relaying. Initiation of a CSST trip by these protective devices also causes automatic fast transfer of the 6.9kV shutdown boards normally supplied from that CSST to their alternate supplies.

3.2 Technical Specification Change Evaluations

OPERABILITY requirements for the onsite and offsite AC sources during plant operation, i.e., for MODES 1, 2, 3 and 4, are specified in TS 3.8.1, "AC Sources - Operating." TS 3.8.1 includes SRs for monitoring of the offsite sources and testing of the DGs. As noted previously, the surveillance tests required per SR 3.8.1.8 (automatic and manual transfer capability of offsite circuits test), SR 3.8.1.9 (single largest load reject test), SR 3.8.1.10 (full load rejection test), SR 3.8.1.11 (LOOP test), SR 3.8.1.13 (protective-trip bypass test), SR 3.8.1.16 (synchronizing test), SR 3.8.1.18 (load sequencing test), and SR 3.8.1.19 (SI signal with LOOP test) must be performed while the plant is in a shutdown condition, i.e., MODE 5 or 6, as enforced through the associated Notes that are to be revised per this LAR. With the plant in MODE 5 or 6, the Technical Specifications (TS 3.8.2) only require two DGs associated with one train to be OPERABLE. Therefore, the DG being tested is, subject to work control processes, not a DG that is being maintained or credited as an OPERABLE DG for satisfying TS 3.8.2.

The proposed changes would allow shutdown board and DG testing to be performed during MODE 1, 2, 3 or 4 - when four DGs are required to be OPERABLE per TS 3.8.1 - so that the DG under test would also be required to be OPERABLE. Any condition associated with the testing that would make the DG not OPERABLE, would require declaring the DG inoperable and entering Required Actions for the inoperable DG. For

example, prior to performance of the DG testing, a check for water in the cylinders would require entering the Required Action under LCO 3.8.1. Also, as part of the preplanned activities, the voltage regulator potentiometer will be rotated (swiped), as part of a preventative maintenance item, and will render the DG inoperable until subsequent voltage checks verify the potentiometer is set correctly.

In light of the electrical system design at WBN, paralleling a DG with the offsite source for testing does not make the DG inoperable. As described in Section 3.1 of this LAR, the DG control circuitry design trips the output breaker of any DG that is in its test mode and is operating in parallel with offsite power whenever an SI signal is actuated. Tripping open the DG breaker satisfies a control logic interlock within the accident response circuits, so that an SI signal will realign the DG to its 'emergency start' mode and override the manual controls used in its 'test' mode. Also, opening the DG breaker when LOOP conditions exist ensures that the associated 6.9kV shutdown board is de-energized and that its undervoltage relays will pickup to initiate load-shedding. After this occurs, the DG operates identically to the way it would have operated if it had been in its standby alignment when the SI signal was actuated. Once the DG is in its emergency start mode and loads have been stripped from its shutdown board, control circuits associated with the load shedding logic and DG voltage/speed status signals close the DG breaker to reenergize the 6.9kV shutdown board. These circuits also start the load sequencer to connect emergency loads to the shutdown board at preset time intervals. Therefore, parallel operation does not adversely affect the capability of the DG to respond to an SI signal.

The length of time that the DG is paralleled to the offsite circuit can be on the order of minutes up to 24 continuous hours or longer, such as required for the endurance and margin test per SR 3.8.1.14. Additionally, SR 3.8.1.3 requires synchronizing the DG to the bus while the bus is being supplied with offsite power and running the machine loaded to a minimum required load for at least 60 minutes. Testing per SR 3.8.1.3 is allowed to be performed during any plant MODE including during plant operation, as it is required to be done monthly. Testing per SR 3.8.1.14 is also allowed to be performed in any plant MODE (on one DG at a time), as was approved in WBN License Amendment 12, dated October 19, 1998.

Furthermore, the removal of the SR Notes concerning MODE restrictions is addressed in NUREG-1431, "Standard Technical Specifications - Westinghouse Plants." Although this LAR proposes to revise, not delete, the SR Notes, it would result in the removal of the MODE restriction from the Unit 2 Shutdown Boards and DGs. Therefore, consistent with the NUREG, the following criteria are given consideration prior to the removal of the MODE restrictions:

> The MODE restrictions may be deleted, if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:
>
> a. Performance of the SR will not render any safety system or component inoperable,
>
> b. Performance of the SR will not cause perturbations to any of the electrical distributionsystems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

Evaluation is provided for each SR as follows.

SR 3.8.1.8

This SR verifies the automatic and manual transfer capability of each 6.9kV Shutdown Board power supply from the normal offsite circuit to each alternate circuit.

The intent of the Note in SR 3.8.1.8 is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations of a unit in MODE 1 or 2.

The performance of this test does not render the 6.9 kV Shutdown Board inoperable while transferring power sources from the normal feeder to the alternate feeder then back to the normal feeder.

The performance of the surveillance will not initiate a perturbation in an electrical distribution system that could challenge a plant safety related system, or challenge steady state conditions to the unit online. Perturbations to the Unit 1 electrical distribution subsystems are prevented by ensuring the Unit 1 Shutdown Boards are powered from another offsite power source prior to opening the normal feeder breaker to a Unit 2 Shutdown Board.

Failure of this surveillance will not challenge or cause an operational transient or challenge to plant safety systems for the unit online. The ability of the 6.9kV Shutdown Board to transfer to the diesel generator will not be inhibited should the ability of the electrical board to automatically or manually transfer to the alternate feeder breaker not be functional. The LOOP circuits will still automatically strip the board and allow the diesel starting and loading sequence to occur providing power to the ESF systems as designed.

SR 3.8.1.9

This SR requires the performance of the single largest load reject test for each diesel generator. Note 1 to SR 3.8.1.9 states that this Surveillance shall not be performed in MODE 1 or 2. The intent of the Note is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations and, as a result, plant safety systems of a unit in MODE 1 or 2.

SR 3.8.1.9 is performed as a part of each DG LOOP testing, which also includes other DG performance and ESF testing. The test of each Unit 2 DG will be performed with the DG aligned to a Unit 2 Shutdown Board that is isolated from offsite power. The load that is used to simulate the largest load rejected is an Essential Raw Cooling Water (ERCW) pump. At a predetermined point in the surveillance, the DG is loaded to a value consistent with accident loading. The ERCW pump in service on the associated 6.9kV Shutdown board will have its handswitch placed in Stop Pull-To-Lock (opens the pump breaker). The surveillance contains acceptance criteria that monitor DG response to

verify the capability to absorb the change in load and provide the proper voltage and frequency response following the loss of load.

As this Surveillance is performed on a Unit 2 DG aligned to a Unit 2 Shutdown Board that is isolated from offsite power, there is no possibility of a perturbation of the Unit 1 electrical distribution system.

The performance of this test does not result in the inoperability of the DG or of the component removed from service during the test.

The performance of the surveillance will not initiate any perturbation in any electrical distribution system that could challenge a plant safety related system, or challenge steady state conditions to the unit online.

Failure of this surveillance will not challenge or cause any operational transient nor challenge to plant safety systems for the unit online.

SR 3.8.1.10

SR 3.8.1.10 requires the performance of the full load reject test for each DG. The Note to SR 3.8.1.10 states that this Surveillance shall not be performed in MODE 1 or 2.The intent of the Note is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations and, as a result, plant safety systems of a unit in MODE 1 or 2.

SR 3.8.1.10 is performed as a part of each DG LOOP testing, which also includes other DG performance and ESF testing. The test of each Unit 2 DG will be performed with the DG aligned to a Unit 2 Shutdown Board that is isolated from offsite power. The tested Unit 2 DG is loaded to normal rated load and power factor and allowed to reach stable temperatures. Upon opening the DG output breaker, the acceptance criteria are monitored to verify the capability of the DG to reject full load and not trip.

Performance of this surveillance on Unit 2 with Unit 1 in MODE 1 or 2 will not result in the inoperability of a safety system or component, other than the Shutdown Board, which will be de-energized for approximately 1 minute before power is restored. Should an actual accident signal be generated during the performance of this surveillance, the DG output breaker will open and the DG will be returned to a standby alignment ready to load as designed.

Performance of this test will not cause a perturbation of a Unit 1 electrical distribution subsystem that could result in a challenge to a safety system or challenge steady state operation to the online unit.

Failure of this surveillance will not result in a challenge to steady state operations to the unit online. The DG breaker will be able to function manually should it be necessary either from the control room or locally at the breaker compartment.

SR 3.8.1.11

SR 3.8.1.11 requires the performance of the LOOP test for each DG. The Note to SR 3.8.1.11 states that this Surveillance shall not be performed in MODE 1 or 2. The intent

of the Note is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations and, as a result, plant safety systems of Unit 1 in MODE 1 or 2.

As required by Regulatory Guide 1.9, this surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the LOOP, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time with all required loads sequencing onto the electrical board under test.

During this surveillance test, the Unit 1 Shutdown Boards are aligned to an offsite power source other than the one involved in the test. This test results in the Unit 2 6.9kV Shutdown Board losing power. Upon sensing the loss of voltage, relays actuate a start signal to the DG associated with the electrical board being tested. All feeder breakers on that board, except the DG feeder, will be tripped open and locked open. Load breakers on the board designed to strip will open. The DG will energize the distribution board followed by sequential loading of the appropriate loads.

Performance of this Surveillance will not result in inoperability of components or systems required for Unit 1, except while preparations are being made to run the DG (as discussed in Section 3.2 of this LAR). The test will only require de-energizing the associated Unit 2 6.9kV Shutdown Board for the time required to signal the DG to start and reenergize the board.

Performance of this Surveillance will not cause any perturbations to any of the electrical distribution systems that could cause a challenge to either steady state operations or a challenge to a unit online, or to plant safety systems.

Performance of this Surveillance will not cause an anticipated operational occurrence resulting in a challenge to a safety system.

<u>SR 3.8.1.13</u>

SR 3.8.1.13 requires verification that each DG automatic protective trips are bypassed on automatic or emergency start signals. The Note to SR 3.8.1.13 states that this Surveillance shall not be performed in MODE 1 or 2.

The intent of the Note is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations and, as a result, plant safety systems of a unit in MODE 1 or 2.

During this surveillance test, the Unit 1 Shutdown Boards are aligned to an offsite power source other than the one involved in the test. This Surveillance may be performed anytime the DG has been started from an accident signal or LOOP. Whenever the DG is under emergency start, only the emergency trips (engine overspeed and generator differential) remain active. These tests are accomplished by placing jumpers, actuating relays, and devices which are removed from service upon an emergency start. Upon actuation of each device, the DG is monitored for tripping and an appropriate alarm is

generated for the DG in test. With no trip, the device is reset, alarm(s) cleared, and the test proceeds to the next device to be tested.

The performance of this test does not render any safety system inoperable, because the design of the system is to remove the non-emergency trip devices from service during the performance of the DG safety related function.

The performance of the surveillance will not initiate any perturbation in any electrical distribution system that could challenge a plant safety related system, or challenge steady state conditions to the unit online.

Failure of this surveillance will not challenge or cause any operational transient nor challenge to plant safety systems for the unit online.

SR 3.8.1.16

SR 3.8.1.16 requires verification that each DG can synchronize to the offsite power source while loaded with emergency loads upon a restoration of offsite power, transfer loads to the offsite power source, and return to ready-to-load operation.

The Note to SR 3.8.1.16 states that this Surveillance shall not be performed in MODE 1 or 2. The intent of the Note is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations and, as a result, plant safety systems of a unit in MODE 1 or 2.

During this surveillance test, the Unit 1 Shutdown Boards are aligned to an offsite power source other than the one involved in the test. The action of realigning the offsite power sources to the Unit 1 Shutdown Boards is considered a routine plant action and poses minimal likelihood of inducing an electrical transient. Once the Unit 1 Shutdown Boards are realigned to the other offsite power source, performance of the surveillance on the Unit 2 DGs does not result in a perturbation on the Unit 1 electrical distribution subsystem.

To accomplish this test, a Unit 2 DG is loaded with the ESF loads started with a simulated accident signal initiated from Unit 2. Following the initiation of the test and verification of the designed components actuating to the safeguard state, the accident signal can be reset. This allows the loads to be transferred back to the 6.9kV Shutdown Board powered from offsite, removed from service, and restored to the standby alignment.

Performance of this surveillance does not render any safety systems inoperable, except while preparations are being made to run the DG (as discussed in Section 3.2 of this LAR).

Performance of this surveillance will not cause any perturbations of the electrical distribution systems for Unit 1 that could challenge steady state operation or challenge any safety systems.

Performance of the SR or failure of the SR will not cause or result in an anticipated operational occurrence resulting in a challenge to plant safety systems.

SR 3.8.1.18

SR 3.8.1.18 requires verification that time delay setting for each sequenced load block is within limits. The Note to SR 3.8.1.18 states that this Surveillance shall not be performed in MODE 1, 2, 3 or 4. The intent of the Note is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations and, as a result, plant safety systems of a unit in MODE 1, 2, 3 or 4.

This surveillance demonstrates proper loading of a Unit 2 DG connected to a Unit 2 Shutdown Board during a LOOP actuation test signal in conjunction with an ESF actuation signal. This test is performed in conjunction with SR 3.8.1.19.

During this surveillance test, the Unit 1 Shutdown Boards are aligned to an offsite power source other than the one involved in the test. The action of realigning the offsite power sources to the Unit 1 Shutdown Boards is considered a routine plant action and poses minimal likelihood of inducing an electrical transient. Once the Unit 1 Shutdown Boards are realigned to the other offsite power source, performance of the surveillance on the Unit 2 DGs does not result in a perturbation on the Unit 1 electrical distribution subsystem.

Performance of this surveillance does not render any safety systems inoperable, except while preparations are being made to run the DG (as discussed in Section 3.2 of this LAR).

Failure of this test sequence will not cause or initiate any challenge to a safety system of the online unit. The individual time delay relays will not cause any safety related challenges to the online unit.

SR 3.8.1.19

SR 3.8.1.19 requires performance of the LOOP/ESF test for each DG. The Note to SR 3.8.1.19 states that this Surveillance shall not be performed in MODE 1, 2, 3 or 4. The intent of the Note is to ensure no surveillance related manipulation or perturbation of the electrical distribution system should be allowed that could challenge continued steady state operations and, as a result, plant safety systems of a unit in MODE 1, 2, 3 or 4.

As required by Regulatory Guide 1.9, this surveillance demonstrates the as designed operation of the standby power sources during a LOOP coincident with an ESF actuation. This test verifies actions encountered from this combination of signals, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time with all required loads sequencing onto the electrical board under test.

During this surveillance test, the Unit 1 Shutdown Boards are aligned to an offsite power source other than the one involved in the test. The action of realigning the offsite power sources to the Unit 1 Shutdown Boards is considered a routine plant action and poses minimal likelihood of inducing an electrical transient. Once the Unit 1 Shutdown Boards are realigned to the other offsite power source, performance of the surveillance on the

Unit 2 DGs does not result in a perturbation on the Unit 1 electrical distribution subsystem.

This test results in the Unit 2 6.9kV Shutdown Board losing power. Upon sensing the loss of voltage, feeder breakers on that board will be tripped open and locked open. Load breakers will open on the board for loads designed to strip. The DG will energize the distribution board followed by sequential loading of the appropriate loads (approximately 10 seconds after losing power to the board).

During the brief period before the shutdown board is re-energized, certain components in common systems (e.g., Essential Raw Cooling Water (ERCW), Component Cooling (CCS), Emergency Gas Treatment (EGTS), Auxiliary Building Gas Treatment, (ABGTS), Control Room Emergency Ventilation (CREVs)) will be de-energized. Therefore, prior to performance of the surveillance, a planned safety assessment will take into consideration and protect the non-tested common equipment to ensure the safety related functions of these common systems are maintained for both plants at all times.

Performance of this surveillance will not cause any perturbations of the electrical distribution systems for Unit 1 that could challenge steady state operation or challenge any safety systems.

Performance of the SR or failure of the SR will not cause or result in an anticipated operational occurrence resulting in a challenge to plant safety systems.

3.3 Description of Integrated Safeguards Test

TVA plans to perform Integrated Safeguards Testing on WBN Unit 2 as part of WBN, Unit 2, startup activities. Subsequent to issuance of an operating license and startup of WBN Unit 2, TVA will be required to perform the TS SRs discussed in this LAR at the current frequency of eighteen months to demonstrate the OPERABILITY of affected equipment for both WBN Unit 1 and WBN Unit 2.

The WBN Unit 2 Integrated Safeguards Test (IST) has been drafted and is currently being reviewed. Although some changes may be made to the test procedure as the result of resolving reviewer comments, it is anticipated that the basic approach for performing the tests, as described herein, will remain unchanged.

The objectives of the WBN Unit 2 Integrated Safeguards test (IST) are to:

- Demonstrate proper automatic actuation, alignment and operation, including bus stripping and load sequencing of the 2A-A and 2B-B DGs and the Train 2A-A and 2B-B load group components controlled by the Engineered Safety Features Actuation system (ESFAS) with and without offsite power.
- Demonstrate electrical independence between redundant load groups by verification of the actuated train components
- Demonstrate operability and reliability of the 2A-A and 2B-B DGs including proper starting and dynamic load response to loss of loads and to load sequencing
- Demonstrate the onsite power supply for safety related loads will automatically and manually transfer to onsite standby diesel units from normal or alternate power supply and manually from diesel generator units back to normal or alternate supply

The test will include the following activities:

- Loss of Offsite Power (LOOP) test
- Safety Injection with Offsite Power Available test
- Coincident LOOP/Safety Injection/Containment Isolation test

As part of the preparations for the IST, the load group (Train) under test will be aligned for normal at-power configuration where possible. For those components that cannot be placed in service in a normal configuration, the components will be tested in a configuration that will allow simulation and actuation. For example, Pressurizer Heater breakers will be placed in test and jumpers applied to bypass the Pressurizer level and RCS pressure interlocks to allow the breaker to operate from the Solid State Protection System (SSPS) output relay and from a LOOP condition. In addition, ESF equipment will be configured for at-power alignment. For example, Unit 2 Safety Injection pumps will be aligned in standby and Unit 2 Centrifugal Charging pumps (high head injection) will be placed in service in a recirculation mode for the appropriate portions of the test.

The testing of the 2A-A and 2B-B DGs as part of the IST (and testing of the 1A-A and 1B-B DGs during performance of the affected SRs subsequent to the approval of this LAR) will be accomplished by alignment of the single train to the test configuration. This configuration includes disabling the common emergency start circuit of the DG under test which would normally start other DGs not being tested. This common emergency start circuit is a non-Class 1E circuit that does not render any DGs inoperable when disabled. Each DG retains its ESF signal and its loss of voltage circuitry that will automatically start any DG, should that event occur on the associated Shutdown Board. The IST will initiate the accident signal or cause a loss of offsite power to a train of electrical distribution boards. The components required to respond to the simulated accident event will be monitored and recorded and verified to meet acceptance criteria. Time measurements will be recorded to ensure the required loads sequence onto the electrical boards in the required time as well as diesel starting and energizing of the associated shutdown board.

The LOOP portion of the IST will be initiated by simulating loss of the offsite power source. This is accomplished by opening the CSST load breaker feeding the 6.9kV Shutdown Board under test. The electrical board senses the loss of power, initiates the opening of the normal feeder breaker, causing the affected DG to start and close onto the affected Shutdown Board. Once the electrical board is energized to proper voltage and frequency, electrical loads are automatically sequenced back onto the electrical board as designed. These loads will be checked for proper response and response time.

For the SI with offsite power available portion of the test, a simulated accident signal will be actuated to the SSPS to cause all components in the tested train to respond as designed. These components will be verified to actuate to the as-designed position and, upon reset of the accident signal, the components will be verified to have remained in the safeguards state. In addition, the Unit 2 ESF pumps will initially be in recirculation, if running, and a simulated accident signal actuating the RCS Cold Leg injection flow path will be injected to provide near- accident condition loading.

For the coincident LOOP/SI/Containment Isolation test, the affected train will be tested under simulated accident signals combining the LOOP with coincident SI and Containment Isolation Phase B. This will test the LOOP circuitry coincidentally with the ability to sequence on the accident loads with the loss of power, and test the components required to respond to the containment isolation signal. The components required to respond to the containment isolation signal include the Containment Spray system, Air Return Fans, cooling water to the RCPs, and control air to containment. All loads will be monitored for proper response and again for response times to ensure all loads sequence on to the DG at the design times. This test will measure the designed loading of the DG to ensure overloading will not occur during designed basis accidents.

The performance of the IST as part of the Unit 2 startup test program will establish the initial completion of the applicable Unit 2 Technical Specification SRs (including those TS 3.8.1 SRs affected by this LAR). Subsequent to the completion of the IST, the affected Unit 2 SRs will be next performed at the first Unit 2 refueling outage consistent with the frequency for those SRs. The SRs will be met by performing plant surveillance instructions that are similar in detail and controls to the procedures used to perform the IST. In addition, following the performance of the IST during the Unit 2 startup test program and consistent with the changes to the SR Notes included in this LAR, TVA will perform the affected surveillances for Unit 1 equipment only during Unit 1 refueling outages.

3.4 Risk Evaluation

As discussed in Section 2.1 above, TVA is proposing modifications to the following Technical Specification Surveillance Requirements: 3.8.1.8, 3.8.1.9, 3.8.1.10, 3.8.1.11, 3.8.1.13, 3.8.1.16, 3.8.1.18, and 3.8.1.19. TVA evaluated the proposed changes against current staff positions associated with NUREG-1431, Revision 3 as discussed in Section 3.2 of this LAR. TVA is not proposing the LAR on a plant specific, risk informed basis such as described in Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decision making: Technical Specifications," Revision 1. However, to ensure an appropriate consideration of risk for this important plant evolution, TVA conducted risk reviews of the proposed changes.

In evaluating risk-insights, TVA employed a simple bounding approach employing risk information from the Watts Bar PRA model to demonstrate that the risk associated with the proposed changes is low. Risk insights for each change are addressed separately.

<u>SR 3.8.1.8</u>

Under the proposed change, the surveillance activity involving transfer of the Unit 2 6.9 kV shutdown boards from normal offsite power supply to alternate offsite power supply would be permitted with Unit 1 in either MODE 1 or 2.

The risk associated with this activity was bounded as follows: To examine the impact of a transfer of Board 2A-A: 6.9kV Shutdown Board Normal Offsite Feeder Breaker 1816 transfers open was set to 1.0, modeling a demand for transfer from normal to alternate supply, and the model was quantified. Similarly for Board 2B-B, 6.9kV Shutdown Board Normal Offsite Feeder Breaker 1828 transfers open was set to 1.0, and the model was quantified. In all cases increases in CDF and LERF for Unit 1 were <5%. TVA considers this modeling approach to be conservative, as it models a transfer demand

due to failure of the normal source and it presumes that the normal source would remain unavailable. In reality, the normal source would remain available.

SR 3.8.1.9

Under the proposed change, the surveillance activity involving reject of the single largest load for each Unit 2 DG would be permitted with Unit 1 in either MODE 1 or 2.

Once two-unit operation is established, the relevant surveillance activities which are potentially risk-significant to Unit 1 during online operation are testing of DGs 2A-A and 2B-B. This will involve tying the DG onto its associated shutdown board, loading the DG, and then tripping a large load. Adding and dropping loads from a station bus is normal activity which contributes negligible risk. The overall risk associated with this test activity can be bounded by the evaluations for SR 3.8.1.8, and SR 3.8.1.11, which evaluate transfer of the shutdown bus from one source to another and removal of normal and alternate power sources to the shutdown board, leaving the DG to supply it. As before, during the proposed testing offsite sources remain available and could be realigned, if needed.

SR 3.8.1.10

Under the proposed change, the surveillance activity involving a full load reject for each Unit 2 DG would be permitted with Unit 1 in either MODE 1 or 2. The test involves the observation that each DG does not trip and the measurement of various DG parameters upon a sudden removal of a heavy loading from the DG. This involves opening the DG output breaker and leaving the Shutdown Board de-energized for approximately 1 minute.

This activity is a variation on other transfers of the Shutdown Board to and from the DG as the power source. The expected plant response is bounded by the response expected to a loss of offsite power, which results in a de-energized Shutdown Board and subsequent restoration of power from the DG. Therefore, the modeling of the activity in SR 3.8.1.11 is a reasonable approximation for this activity. The modeling of the activity in SR 3.8.1.11 fails normal and alternate offsite power sources to the shutdown board in test. TVA considers this modeling approach to be conservative, as the sources would actually remain available during the test.

SR 3.8.1.11

Under the proposed change, the surveillance activity involving loss of offsite power for each Unit 2 DG would be permitted with Unit 1 in either MODE 1, 2, 3 or 4.

The risk associated with this test can be evaluated by modeling the loss of normal and alternate offsite power to each Unit 2 6.9 kV shutdown bus in turn. The risk during online operation of Unit 1 presented by testing on Unit 2 can be bounded as follows: For Board 2B-B, 6.9kV Shutdown Board Alternate Offsite Feeder Breaker 1938 fails to close, and 6.9kV Shutdown Board Normal Offsite Feeder Breaker 1828 transfers open can be set to 1.0, and the model quantified. In all cases increases in CDF and LERF for Unit 1 were <5%. A similar exercise was performed for the 2A-A Shutdown Board and the results were bounded by the results for Board 2B-B. TVA considers the modeling approach employed is conservative, as it models a transfer demand and considers that

normal and alternate offsite sources are unavailable. In reality, the normal and alternate sources would remain available.

SR 3.8.1.13

Under the proposed change, the surveillance activity involving verification that certain Unit 2 DG automatic trips are bypassed on automatic or emergency start signals would be permitted with Unit 1 in either MODE 1 or 2. This activity is subsumed in the other evaluated activities (e.g., SR 3.8.1.11). The risk is bounded by the evaluations for those activities.

SR 3.8.1.16

Under the proposed change, the surveillance activity involving paralleling of each Unit 2 DG with offsite power and restoration of shutdown board to normal alignment would be permitted with Unit 1 in either MODE 1 or 2.

This test involves transfer of power to the shutdown boards from offsite and may be considered to be bounded by the evaluations for SR 3.8.1.8 and SR 3.8.1.11. TVA considers this to be conservative, because all power sources should be available and the DG in good running order.

SR 3.8.1.18

Under the proposed change, the surveillance activity involving verification that the Unit 2 DGs time delay setting for each sequenced load block is within limits would be permitted with Unit 1 in either MODE 1, 2, 3 or 4. This activity is subsumed by the other activities evaluated. The risk is bounded by the evaluation for SR 3.8.1.11.

SR 3.8.1.19

Under the proposed change, the surveillance activity involving a Unit 2 loss of offsite power signal in conjunction with an ESF actuation signal would be permitted with Unit 1 in either MODE 1, 2, 3 or 4.

From a risk perspective, this activity is similar to the activity evaluated for SR 3.8.1.11. The evaluation of risk performed for that element is applicable in this case.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements and Criteria

The onsite standby ac power systems at WBN are designed to comply with the following applicable regulations and requirements:

- 10 CFR 50, Appendix A, General Design Criterion (GDC) 17, "Electric power systems," specifies that an onsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety.

- 10 CFR 50, Appendix A, 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 1.6, Revision 0, "Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems," describes an acceptable degree of independence between redundant standby (onsite) power sources and between their distribution systems.

- Regulatory Guide 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electrical Power Systems at Nuclear Power Plants," describes the selection, design, qualification, and testing of DGs.

- Institute of Electrical and Electronics Engineers (IEEE) Standard 308-1971, "Criteria for Class 1E Power Systems for Nuclear Power Generating Stations," provides criteria for the determination of Class 1E power system design features and the requirements for their testing, surveillance, and documentation.

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

4.2 Precedent

TVA evaluated precedent license amendment requests in which the NRC had approved modification of mode restriction notes for Surveillances in TS 3.8.1. TVA identified the following precedents that were applicable, in part, to the changes TVA is proposing in this LAR:

- Palo Verde Nuclear Generating Station, Units 1, 2 and 3, – Issuance of Amendments on Technical Specifications 3.8.1 and 3.8.4 - Alternating Current (AC) and Direct Current (DC) Electric Power Sources (TAC Nos. MB9150, MB9151 and MB 9152), dated September 29, 2005.

- Diablo Canyon Power Plant, Unit Nos. 1 and 2 – Issuance of Amendments - Technical Specifications 3.8.1 and 3.8.4 - AC and DC Sources (TAC Nos. MB9476 and MB 9477), dated September 28, 2004.

- Wolf Creek Generating Station – Issuance of Amendment Re: Technical Specifications 3.8.1 and 3.8.4 – AC and DC Sources (TAC No. MB8763), dated July 12, 2004.

The above license amendments, in part, combine the removal of the MODE restriction Note from some surveillances with the application of the TSTF-283, Revision 3 changes to other surveillances. Removal of the MODE restriction Notes allows the surveillances to be performed in any MODE. Application of the TSTF-283 changes allows the flexibility to perform the surveillances for the purpose of reestablishing OPERABILITY without having to shutdown the associated unit.

The approach used in the above license amendments is similar to the proposed changes for WBN Unit 1. However, removal of the SR Note MODE restriction for WBN Unit 2

(while in MODE 5 or 6) can be applied to each identified WBN Unit 1 surveillance. This is possible because testing of WBN Unit 2 shutdown boards and DGs does not result in a perturbation of the other shutdown boards, does not start or cause a Unit 1 DG to be inoperable, and does not actuate or cause a Unit 1 ESF system to be inoperable.

4.3 Significant Hazard Consideration

TS 3.8.1 Surveillance Notes are revised to allow performance of the Surveillances on WBN Unit 2 shutdown boards and DGs while WBN Unit 1 is operating in MODES 1 – 2, or MODES 1 – 4, as applicable.

The Tennessee Valley Authority (TVA) has concluded that the changes to WBN Unit 1 TS 3.8.1 do not involve a significant hazards consideration. TVA's conclusion is based on its evaluation in accordance with 10 CFR 50.91(a)(1) of the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed 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 do not require physical changes to plant systems, structures, or components. The DGs and their associated emergency loads are accident mitigating features. As such, testing of the DGs is not associated with a potential accident-initiating mechanism. Therefore, the changes do not affect accident or transient initiation or consequences.

   The probability or consequences of previously evaluated accidents will not be significantly affected by the revised Surveillance Notes, because a sufficient number of onsite AC power sources will continue to remain available to perform the accident mitigation functions associated with the DGs, as assumed in the accident analyses. Therefore, the proposed changes do 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 proposed changes would not require any new or different accidents to be postulated, since no changes are being made to the plant that would introduce any new accident causal mechanisms. This license amendment request does not impact any plant systems that are potential accident initiators; nor does it have any significantly adverse impact on any accident mitigating systems.

   Therefore, the proposed changes do 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 do not alter the permanent plant design, including instrument set points, nor does it change the assumptions contained in the safety analyses. The DG alternate AC system and other required safety systems are designed with sufficient redundancy such that a DG from the non-operating unit may have surveillance and testing performed while the affected unit is operating. The proposed changes do not impact the redundancy or availability requirements of offsite power supplies or change the ability of the plant to cope with station blackout events. Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

4.4 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 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. However, 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.

ATTACHMENT 1

Proposed TS Changes (Mark-Ups) for Watts Bar Nuclear Plant, Unit 1

ATTACHMENT 2

Proposed TS Bases Changes (Mark-Ups) for Watts Bar Nuclear Plant, Unit 1

ATTACHMENT 3

Proposed TS Changes (Final Typed) for Watts Bar Nuclear Plant, Unit 1

ATTACHMENT 4

Proposed TS Bases Changes (Final Typed) for Watts Bar Nuclear Plant, Unit 1

ATTACHMENT 5

Watts Bar Nuclear Plant 6.9 kV – 480 VAC Electrical Distribution System Diagram

ATTACHMENT 1

Proposed TS Changes (Mark-Ups) for Watts Bar Nuclear Plant, Unit 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	Verify each DG starts from standby condition and 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 ≥ 58.8 Hz and ≤ 61.2 Hz.	184 days
SR 3.8.1.8	For the 1A-A and 1B-B Shutdown Boards, this ----------NOTE---------- ~~This~~ Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify automatic and manual transfer of each 6.9 kV shutdown board power supply from the normal offsite circuit to each alternate offsite circuit.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	For DGs 1A-A and 1B-B, this ----------NOTES---------- 1. ~~This~~ Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≥ 0.8 and ≤ 0.9. ---------- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; b. Within 3 seconds following load rejection, the voltage is ≥ 6555 V and ≤ 7260 V; and c. Within 4 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.10	For DGs 1A-A and 1B-B, this ----------NOTE---------- ~~This~~ Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor ≥ 0.8 and ≤ 0.9 does not trip and voltage is maintained ≤ 8880 V during and following a load rejection of ≥ 3960 kW and ≤ 4400 kW and ≥ 2970 kVAR and ≤ 3300 kVAR.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	For DGs 1A-A and 1B-B, this ----------NOTE---------- ~~This~~ Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage ≥ 6800 V and ≤ 7260 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	For DGs 1A-A and 1B-B, this ----------NOTE---------- ~~This~~ Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG's automatic trips are bypassed on automatic or emergency start signal except: a. Engine overspeed; and b. Generator differential current.	18 months
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. For performance of this test in MODE 1, 2, 3 or 4, three DGs must be maintained operable and in a standby condition. 3. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor ≥ 0.8 and ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 4620 kW and ≤ 4840 kW and ≥ 3465 kVAR and ≤ 3630 kVAR; and b. For the remaining hours of the test loaded ≥ 3960 kW and ≤ 4400 kW and ≥ 2970 kVAR and ≤ 3300 kVAR.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTE---------- This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3960 kW and ≤ 4400 kW. Momentary transients outside of load range do not invalidate this test. ---------- Verify each DG starts and 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 ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.16	For DGs 1A-A and 1B-B, this ----------NOTE---------- ~~This~~ Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify, with each Unit 1 DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	18 months
SR 3.8.1.18	For DGs 1A-A and 1B-B, this ----------NOTE---------- ~~This~~ Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify the time delay setting for each sequenced load block is within limits for each accident condition and non-accident condition load sequence.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	For DGs 1A-A and 1B-B, this ----------NOTE---------- ~~This~~ Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DGs of the same power train auto-start from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage: ≥ 6800 V and ≤ 7260 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months
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

(continued)

ATTACHMENT 2

Proposed TS Bases Changes (Mark-Ups) for Watts Bar Nuclear Plant, Unit 1

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.

for the 1A-A or 1B-B Shutdown Board

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. 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.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

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, voltage, and frequency 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 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).

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR for DG 1A-A or 1B-B could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

This SR is modified by a Note. The reason for the Note is that during operation with the reactor critical, performance of this SR for DG 1A-A or 1B-B could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. 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.

SR 3.8.1.11

As required by Regulatory Guide 1.9 (Ref. 3), paragraph C2.2.4, this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

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.

SR 3.8.1.12

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (10 seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ 5 minutes. 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 second 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 5 minute period provides sufficient time to demonstrate stability. Since the Unit 2 DGs only carry the common load required for the loss of offsite power event, this anticipatory test would only start the Unit 1 DGs. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power.

The requirement to verify the connection of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on an automatic or emergency start signal and that critical protective functions (engine overspeed and generator differential current) remain functional to affect a DG trip to avert substantial damage to the DG unit or to the safety related equipment powered by the DG. It is not necessary to actually trip the DG using critical protective functions in order to satisfy this SR. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

The 18 month Frequency is based on engineering judgment, taking into consideration 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.

1A-A or 1B-B

The SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove ~~a required~~ DG from service. 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)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

This SR is modified by a Note to ensure that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test.

SR 3.8.1.16

As required by Regulatory Guide 1.9 (Ref. 3), paragraph C2.2.11, this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, and takes into consideration plant conditions required to perform the Surveillance.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a LOCA actuation signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 13), paragraph 6.2.6(2).

The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.12. The intent in the requirement associated with SR 3.8.1.17.b is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

Under accident and loss of offsite power conditions loads are sequentially connected to the 6.9 kV shutdown board by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The load sequence time specified in FSAR Table 8.3-3 ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load block and that safety analysis assumptions regarding ESF equipment time delays are not violated. The allowable values for the time delay relays are contained in system specific setpoint scaling documents. Reference 2 provides a summary of the automatic loading of ESF buses.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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.

SR 3.8.1.19

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

The Frequency of 18 months takes into consideration plant conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 18 months.

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. With WBN in one unit operation, this test will be conducted on a per train basis. Since the Unit 2 DGs are required to carry the common loads during a loss of offsite power event, the respective Unit 2 DG on the same power train will be tested with its respective Unit 1 DG. This is to minimize shutdown board room alignment and restoration.

This SR is modified by a Note. The reason for the Note is that the performance of the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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.

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.

(continued)

ATTACHMENT 3

Proposed TS Changes (Final Typed) for Watts Bar Nuclear Plant, Unit 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	Verify each DG starts from standby condition and 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 ≥ 58.8 Hz and ≤ 61.2 Hz.	184 days
SR 3.8.1.8	----------NOTE---------- For the 1A-A and 1B-B Shutdown Boards, this Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify automatic and manual transfer of each 6.9 kV shutdown board power supply from the normal offsite circuit to each alternate offsite circuit.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTES---------- 1. For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≥ 0.8 and ≤ 0.9. ---------- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 66.75 Hz; b. Within 3 seconds following load rejection, the voltage is ≥ 6555 V and ≤ 7260 V; and c. Within 4 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.10	----------NOTE---------- For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor ≥ 0.8 and ≤ 0.9 does not trip and voltage is maintained ≤ 8880 V during and following a load rejection of ≥ 3960 kW and ≤ 4400 kW and ≥ 2970 kVAR and ≤ 3300 kVAR.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTE---------- For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage ≥ 6800 V and ≤ 7260 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	----------NOTE---------- For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG's automatic trips are bypassed on automatic or emergency start signal except: a. Engine overspeed; and b. Generator differential current.	18 months
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. For performance of this test in MODE 1, 2, 3 or 4, three DGs must be maintained operable and in a standby condition. 3. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG operating at a power factor ≥ 0.8 and ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 4620 kW and ≤ 4840 kW and ≥ 3465 kVAR and ≤ 3630 kVAR; and b. For the remaining hours of the test loaded ≥ 3960 kW and ≤ 4400 kW and ≥ 2970 kVAR and ≤ 3300 kVAR.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTE---------- This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3960 kW and ≤ 4400 kW. Momentary transients outside of load range do not invalidate this test. ---------- Verify each DG starts and 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 ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.16	----------NOTE---------- For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify, with each Unit 1 DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	18 months
SR 3.8.1.18	----------NOTE---------- For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify the time delay setting for each sequenced load block is within limits for each accident condition and non-accident condition load sequence.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	----------NOTE---------- For DGs 1A-A and 1B-B, this Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DGs of the same power train auto-start from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage: ≥ 6800 V and ≤ 7260 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months
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

(continued)

ATTACHMENT 4

Proposed TS Bases Changes (Final Typed) for Watts Bar Nuclear Plant, Unit 1

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 a Note. The reason for the 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. 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.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

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, voltage, and frequency 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 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).

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR for DG 1A-A or 1B-B could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

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.

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, Note 2 requires that, if synchronized to offsite power testing must be performed using a power factor ≥ 0.8 and ≤ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, testing must be performed using a power factor ≥ 0.8 and ≤ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.9 (Ref. 3) and is intended to be consistent with expected fuel cycle lengths.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

This SR is modified by a Note. The reason for the Note is that during operation with the reactor critical, performance of this SR for DG 1A-A or 1B-B could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. 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.

SR 3.8.1.11

As required by Regulatory Guide 1.9 (Ref. 3), paragraph C2.2.4, this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

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.

SR 3.8.1.12

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (10 seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ 5 minutes. 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 second 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 5 minute period provides sufficient time to demonstrate stability. Since the Unit 2 DGs only carry the common load required for the loss of offsite power event, this anticipatory test would only start the Unit 1 DGs. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power.

The requirement to verify the connection of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on an automatic or emergency start signal and that critical protective functions (engine overspeed and generator differential current) remain functional to affect a DG trip to avert substantial damage to the DG unit or to the safety related equipment powered by the DG. It is not necessary to actually trip the DG using critical protective functions in order to satisfy this SR. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

The 18 month Frequency is based on engineering judgment, taking into consideration 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.

The SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove DG for DG 1A-A or 1B-B from service. 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 3.8.1.15 (continued)

This SR is modified by a Note to ensure that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test.

SR 3.8.1.16

As required by Regulatory Guide 1.9 (Ref. 3), paragraph C2.2.11, this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, and takes into consideration plant conditions required to perform the Surveillance.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

Under accident and loss of offsite power conditions loads are sequentially connected to the 6.9 kV shutdown board by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The load sequence time specified in FSAR Table 8.3-3 ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load block and that safety analysis assumptions regarding ESF equipment time delays are not violated. The allowable values for the time delay relays are contained in system specific setpoint scaling documents. Reference 2 provides a summary of the automatic loading of ESF buses.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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.

SR 3.8.1.19

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

The Frequency of 18 months takes into consideration plant conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 18 months.

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. With WBN in one unit operation, this test will be conducted on a per train basis. Since the Unit 2 DGs are required to carry the common loads during a loss of offsite power event, the respective Unit 2 DG on the same power train will be tested with its respective Unit 1 DG. This is to minimize shutdown board room alignment and restoration.

This SR is modified by a Note. The reason for the Note is that the performance of the Surveillance for DG 1A-A or 1B-B would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. 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.

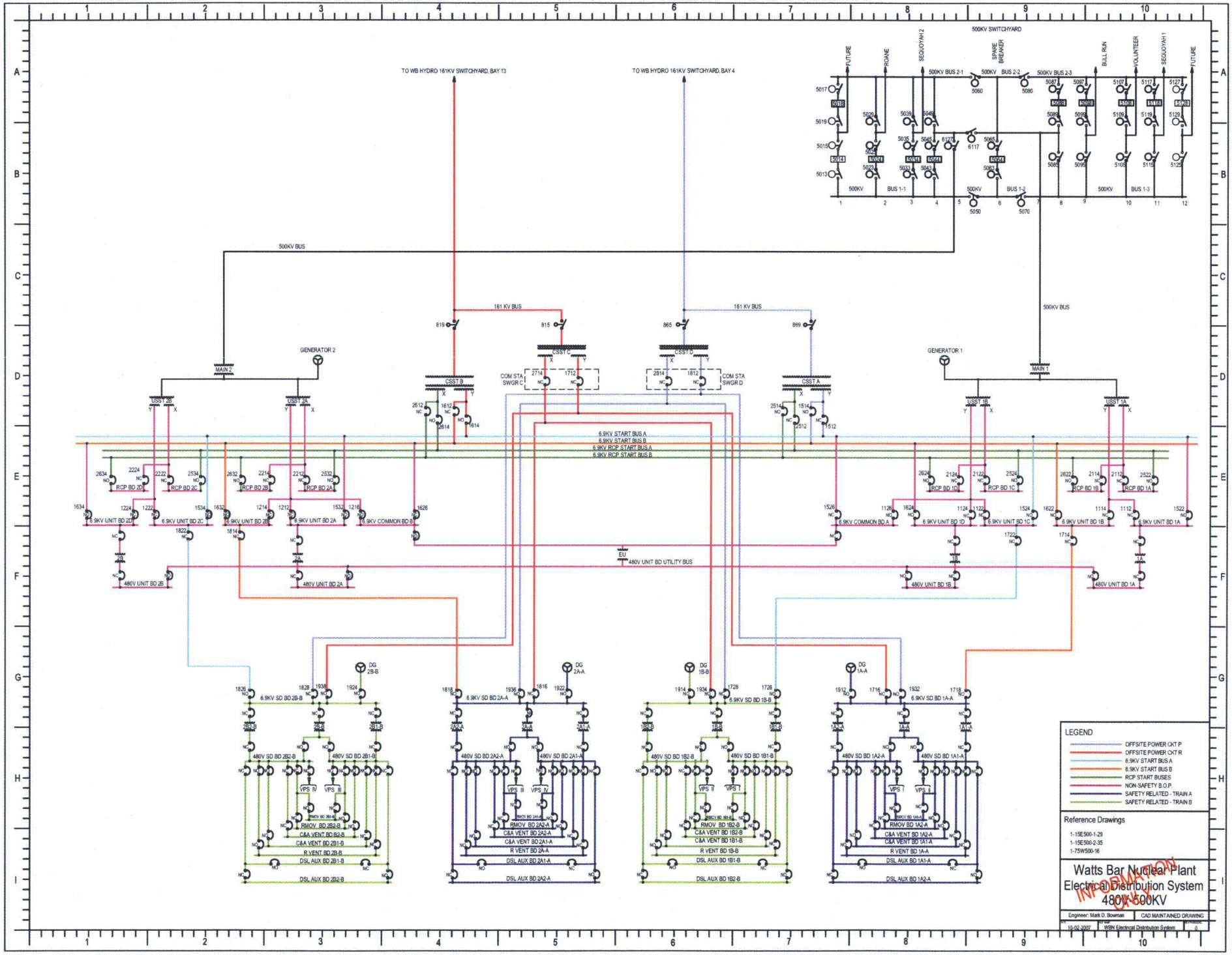
SR 3.8.1.20

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.

(continued)

ATTACHMENT 5

Watts Bar Nuclear Plant 6.9 kV – 480 VAC Electrical Distribution System Diagram


500KV SWITCHYARD
TO WB HYDRO 161KV SWITCHYARD, BAY 13
TO WB HYDRO 161KV SWITCHYARD, BAY 4
500KV BUS
161 KV BUS
GENERATOR 2
GENERATOR 1
MAIN 2
MAIN 1
CSST B
CSST C
CSST D
CSST A
COM STA SWGR C
COM STA SWGR D
6.9KV START BUS A
6.9KV START BUS B
6.9KV RCP START BUS A
6.9KV RCP START BUS B
480V UNIT BD UTILITY BUS
DG 2B-B
DG 2A-A
DG 1B-B
DG 1A-A
LEGEND
OFFSITE POWER CKT P
OFFSITE POWER CKT R
6.9KV START BUS A
6.9KV START BUS B
RCP START BUSES
NON-SAFETY B.O.P.
SAFETY RELATED - TRAIN A
SAFETY RELATED - TRAIN B
Reference Drawings
1-15E500-1-29
1-15E500-2-35
1-75W500-16
Watts Bar Nuclear Plant
Electrical Distribution System
480V-500KV
Engineer: Mark D. Bowman
CAD MAINTAINED DRAWING
10-02-2007
WBN Electrical Distribution System
INFORMATION ONLY