Palo Verde Nuclear
Generating Station

David Mauldin
Vice President
Nuclear Engineering
and Support

TEL (623) 393-5553
FAX (623) 393-6077

10 CFR 50.90
Mail Station 7605
P.O. Box 52034
Phoenix, AZ 85072-2034

102-04946-CDM/TNW/JAP
May 28, 2003

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN 50-528/529/530
Amendment to Technical Specification
3.8.1, AC Sources – Operating and 3.8.4, DC
Sources - Operating**

Dear Sirs:

In accordance with 10 CFR 50.90, enclosed is an application for amendment to Facility Operating License Nos. NPF-41, NPF-51, and NPF-74 for Units 1, 2, and 3 of the Palo Verde Nuclear Generating Station (PVNGS), respectively. This License Amendment Request (LAR) revises Technical Specification (TS) 3.8.1, "AC Sources - Operating" to allow surveillance testing of the onsite standby emergency diesel generators (DG) during modes in which it is currently prohibited. Specifically, PVNGS proposes removing the mode restrictions for the following Surveillance Requirements (SRs), SR 3.8.1.10, (full load rejection test), SR 3.8.1.13 (protective-trip bypass test), SR 3.8.1.14 (endurance and margin test), and SR 3.8.1.20 (DG starting independence). This LAR also incorporates changes included in NRC approved Industry/Technical Specification Task Force (TSTF) Standard Technical Specification (STS) change TSTF-283, Revision 3. These changes modify the Notes in SRs 3.8.1.8, (transfer of AC sources test), 3.8.1.9 (post accident load rejection test), 3.8.1.11 (simulated loss of offsite power test), 3.8.1.12 (auto-start on Safety Injection (SI) signal test), 3.8.1.16 (restoration of loads to offsite power test), 3.8.1.17 (verification of test mode override test), 3.8.1.18 (engineered safety feature and auto-transfer load sequencing test), 3.8.1.19 (loss of offsite power plus SI signal response test), SR 3.8.4.6 (battery charger test), 3.8.4.7 (battery service test), and 3.8.4.8 (battery discharge test) to allow performance of the surveillances in order to re-establish operability following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated operability concerns during plant operation.

A001

Enclosure 1 contains a description of the proposed change, the supporting technical analyses, and the significant hazards determination. Enclosures 2 and 3 contain marked-up and revised TS pages, respectively. Enclosure 4 contains the TS Bases changes (for information only) to assist the staff in its review of the proposed changes. Revision to the TS Bases will be implemented pursuant to the TS Bases Control Program, TS 5.5.14, upon approval of this license amendment.

Additionally, the footnote associated with TS SR 3.8.4.8 will be deleted. This footnote was associated with coming out of the ninth refueling outage for Unit 1, which has since passed.

Arizona Public Service Company (APS) is submitting this LAR in conjunction with an industry consortium of six stations as a result of a mutual agreement known as Strategic Teaming and Resource Sharing (STARS). The STARS group consists of the six stations operated by TXU Generation Company LP, Union Electric Company, Wolf Creek Nuclear Operating Corporation, Pacific Gas and Electric Company, STP Nuclear Operating Company, and Arizona Public Service Company. The other members of the group (except STP Nuclear Operating Company) are expected to submit license amendment requests similar to this one. Pacific Gas and Electric Company's Diablo Canyon plant is the lead plant for this proposed license amendment. Due to differences between the STARS plants, there may be some differences in the plant LARs, particularly for the information provided in Enclosure 1.

Based on the responses to the three criteria provided for determining whether a significant hazard consideration exists as stated in 10 CFR 50.92, APS has concluded that the proposed amendment involves no significant hazard consideration.

In accordance with the PVNGS Quality Assurance Program, the Plant Review Board and Offsite Safety Review Committee have reviewed and concurred with this proposed amendment. By copy of this letter, this request is being forwarded to the Arizona Radiation Regulatory Agency (ARRA) pursuant to 10 CFR 50.91(b)(1).

The changes proposed in this LAR are not required to address an immediate safety concern. APS requests that this amendment be approved by May 31, 2004. APS requests the LAR be made effective upon NRC issuance, to be implemented within 90 days from the date of issuance.

No commitments are being made to the NRC by this letter.

Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,

CDM/TNW/JAP

Enclosures:

- Notarized Affidavit
- Enclosure 1 – APS' evaluation of proposed changes
- Enclosure 2 – Marked-up Technical Specification pages
- Enclosure 3 – Revised Technical Specification pages
- Enclosure 4 – Marked-up Technical Specification Bases changes (for information only)

cc: Regional Administrator – NRC Region IV
J. N. Donohew
N. L. Salgado
A. V. Godwin

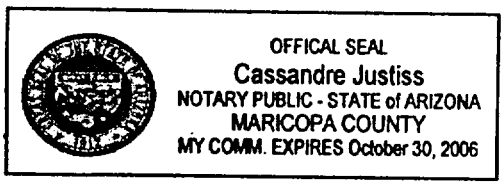
STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, David Mauldin, represent that I am Vice President Nuclear Engineering and Support, Arizona Public Service Company (APS), that the foregoing document has been signed by me on behalf of APS with full authority to do so, and that to the best of my knowledge and belief, the statements made therein are true and correct.

David Mauldin

Sworn To Before Me This 28th Day Of May, 2003.

Notary Public



Notary Commission Stamp

Enclosure 1

APS' EVALUATION

Proposed Amendment to Technical Specification 3.8.1 and 3.8.4 Surveillance Requirements

1.0 Description

2.0 Proposed Change

3.0 Background

4.0 Technical Analysis

5.0 Regulatory Analysis

6.0 Environmental Consideration

7.0 References

8.0 Precedent

1.0 DESCRIPTION

Mode Restriction Elimination

The proposed changes will remove the Mode 1 and 2 restrictions for the following Surveillance Requirements (SRs): SR 3.8.1.10 (full load rejection test), SR 3.8.1.13 (protective-trip bypass test), SR 3.8.1.14 (endurance and margin test), and SR 3.8.1.20 (DG starting independence) associated with the emergency diesel generators (DGs). These changes will allow SRs 3.8.1.10, 3.8.1.13, 3.8.1.14, and SR 3.8.1.20 to be performed for periodic surveillance testing, and/or following planned or unplanned maintenance during plant operation.

TSTF-283 Revision 3 Changes

In addition, the proposed changes modify the Notes in SRs 3.8.1.8 (transfer of AC sources), 3.8.1.9 (single load rejection test), 3.8.1.11 (loss of offsite power test), 3.8.1.12 (safety injection actuation signal test), 3.8.1.16 (synchronizing test), 3.8.1.17 (change-over test), 3.8.1.18 (engineered safety feature and auto-transfer load sequencing test), 3.8.1.19 (combined safety injection actuation signal and loss of offsite power test), 3.8.4.6 (battery charger test), 3.8.4.7 (battery service test), and 3.8.4.8 (battery discharge test) to allow performance of the surveillances in order to re-establish operability following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated operability concerns during plant operation. The changes to these Notes are consistent with NRC approved Industry/Technical Specification Task Force (TSTF) Standard Technical Specification (STS) change TSTF-283, Revision 3.

Additionally, the footnote associated with SR 3.8.4.8 will be deleted. This footnote was associated with coming out of the ninth refueling outage for Unit 1 (U1R9), which has since passed. U1R9 outage was completed May of 2001.

2.0 PROPOSED CHANGES

Mode Restriction Elimination

The following changes eliminate the Mode 1 and 2 surveillance testing restrictions. Under each bullet the first statement is the existing Technical Specification (TS) Note and the second is the proposed change.

- SR 3.8.1.10 contains the following Note:

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

  The Note contained in SR 3.8.1.10 would be removed.

- SR 3.8.1.13 contains the following Note:

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

  The Note contained in SR 3.8.1.13 would be removed.

- SR 3.8.1.14 contains Note 2 which states the following:

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

  The Note contained in SR 3.8.1.14 would be removed.

- SR 3.8.1.20 contains Note 2 which states the following:

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

  The Note contained in SR 3.8.1.20 would be removed.

These proposed changes will allow performance of the testing specified by these SRs during all Modes of operation such that the testing will no longer be required to be performed only during plant outages. This will help to reduce the complexity of coordinating work and testing activities during refueling outages and could potentially reduce outage critical path time. The change will also maximize flexibility in responding to an event during shutdown when other engineered safety feature (ESF) equipment may be out of service. In addition, this change could potentially avoid a plant shutdown if maintenance (planned or unplanned) performed during power operation results in the need to perform the surveillance to demonstrate operability.

TSTF-283 Revision 3 Changes

The following proposed changes modify the existing TS to allow more flexibility in the DG testing in accordance with TSTF-283, Revision 3. Under each bullet the first statement is the existing TS Note and the second is the proposed change.

- SR 3.8.1.8 contains the following Note:

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

  This Note contained in SR 3.8.1.8 would be replaced with the following Note: "This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.1.9 contains the following Note:

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

  The Note contained in SR 3.8.1.9 would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.1.11 contains Note 2 which states:

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

  The Note contained in SR 3.8.1.11 would be replaced with the following Note 2:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.1.12 contains Note 2 which states:

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

  The Note contained in SR 3.8.1.12 would be replaced with the following Note 2:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.1.16 contains the following Note:

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

  The Note contained in SR 3.8.1.16 would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3 or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.1.17 contains the following Note:

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

The Note contained in SR 3.8.1.17 would be replaced with the following Note:

"This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.1.18 contains the following Note:

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

  The Note contained in SR 3.8.1.18 would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3 or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.1.19 contains Note 2 which states:

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

  The Note contained in SR 3.8.1.19 would be replaced with the following Note 2:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.4.6 contains following Note:

  "This Surveillance shall not be performed in MODE 1, 2, 3, or 4 on the charger credited for OPERABILITY."

  The Note contained in SR 3.8.4.6 would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4 on the charger credited for OPERABILITY. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.4.7 contains Note 2 which states:

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

  The Note contained in SR 3.8.4.7 would be replaced with the following Note 2:

"This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

- SR 3.8.4.8 contains the following Note:

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

  The Note contained in SR 3.8.4.8 would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced."

Incorporating TSTF-283 for the affected SRs will give the flexibility to perform these surveillances for the purpose of reestablishing OPERABILITY without having to shut down the associated unit. Performing these surveillances online can potentially eliminate any transients involved with having to shutdown the associated unit.

The marked-up and revised TS pages are provided in Enclosures 2 and 3, respectively. The associated TS Bases will be revised to reflect the changes to these TS. A marked-up copy of the proposed TS Bases changes is provided in Enclosure 4, for information only. TS Bases changes will be implemented in accordance with TS 5.5.14, "Technical Specifications (TS) Bases Control Program," as a part of the implementation of this amendment following NRC approval.

3.0 BACKGROUND

3.1 Description of Class 1E Alternating Current (AC) Power System and Emergency Diesel Generators

Palo Verde Nuclear Generating Station (PVNGS) TS 3.8.1, "AC Sources – Operating," specifies control requirements for the Class 1E AC electrical power distribution system. The Class 1E AC distribution system for each unit is fed from two offsite power sources (525 kilovolt (kV) stepped down to 13.8 kV), and from onsite vital standby power sources (two diesel generators (DGs) for each unit). 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 Class 1E AC distribution system for each unit is divided into two independent load groups (designated Class 4.16kV buses (PB) PBA-S03 and PBB-S04) so that the loss of any one group or bus does not prevent the

minimum safety functions from being performed. Each of these load groups or buses has connections to offsite power sources and a single dedicated DG.

The offsite power is supplied to the 525 kV switchyard from offsite transmission networks. The 525 kV sources are stepped down to 13.8 kV through three Startup Transformers which are shared amongst the three PVNGS units. From the 525 kV switchyard there are two 13.8 kV sources (two separate startup transformers) which are electrically and physically separated circuits that provide input to 4.16 kV ESF service transformers. A detailed description of the offsite power network and the circuits to the Class 1E buses is found in the PVNGS Updated Final Safety Analysis Report (UFSAR), Chapter 8.

Single line diagrams of the [onsite] AC distribution system are shown in Figure 1 (Onsite 525 kV/13.8 kV Distribution System) and Figure 2 (Onsite Class 4.16 kV System) below.

Figure 1

Onsite 525 kV/13.8 kV Distribution System

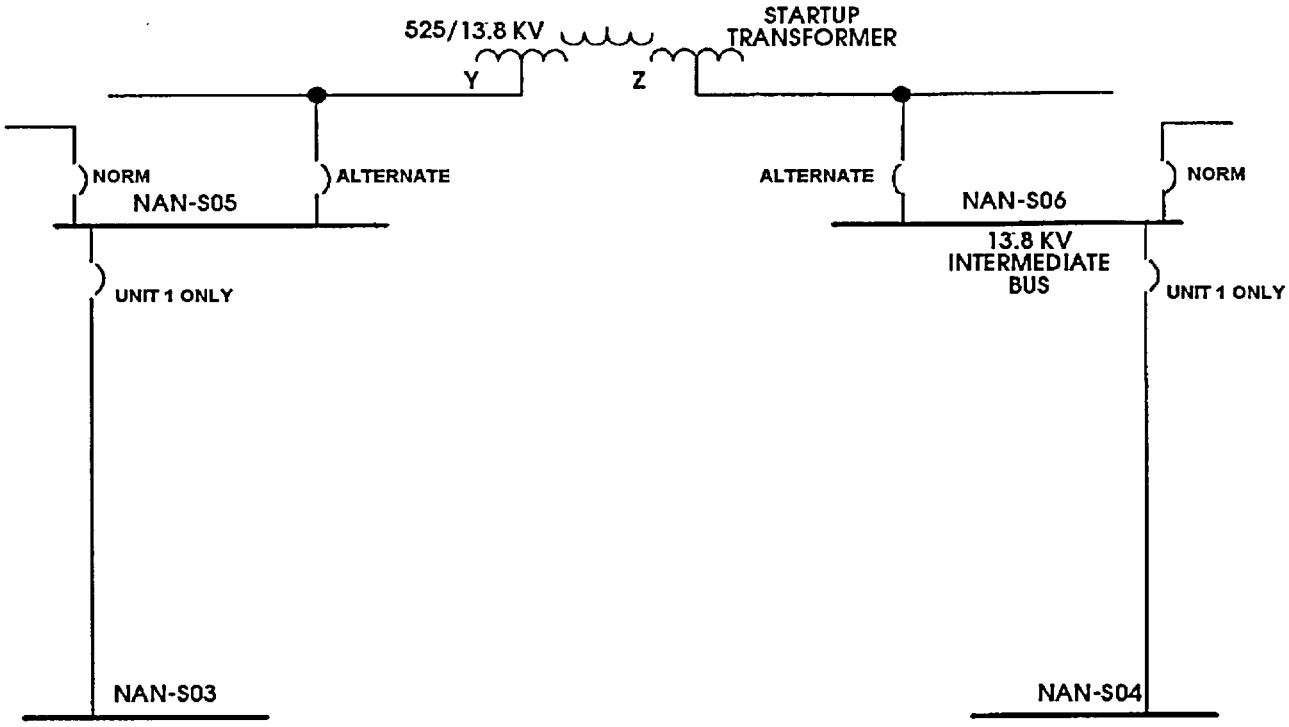
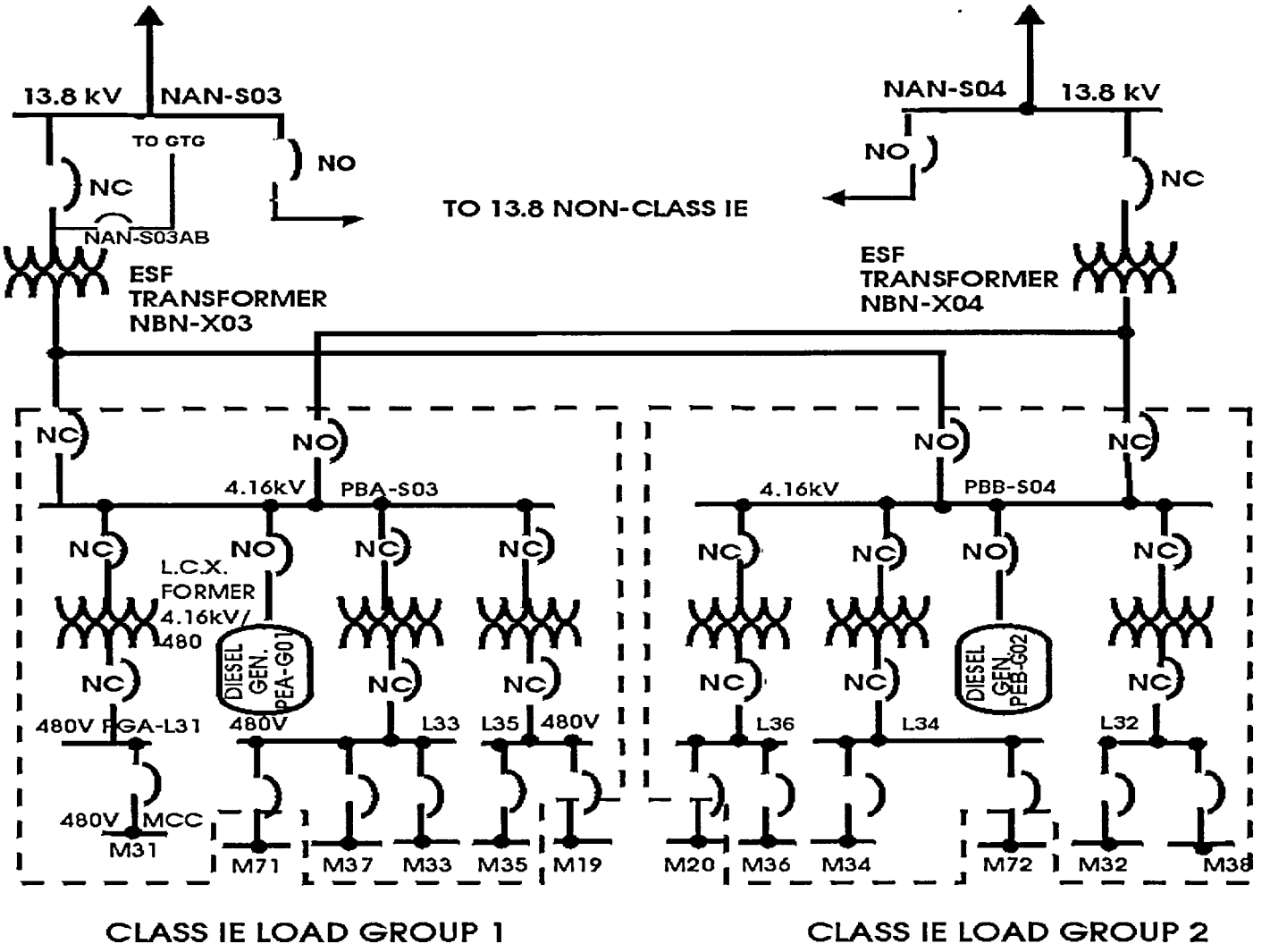


Figure 2

Onsite Class 4.16 kV System



The onsite standby power source for each Class 1E 4.16 kV AC bus is a dedicated DG. Each DG is capable of starting automatically on a safety injection actuation signal (SIAS) (e.g., low pressurizer pressure or high containment pressure signals), containment spray actuation signal (CSAS), auxiliary feedwater actuation signal (AFAS), or on a Class 1E 4.16 kV AC (PB) vital bus degraded voltage or undervoltage signal – loss of offsite power (LOP). After the DG has started, it will automatically tie to its respective bus if offsite power is tripped as a consequence of vital bus undervoltage or degraded voltage, independent of or coincident with an SIAS, CSAS, or AFAS signal. The DGs will also start and operate in the standby mode without tying to the vital bus on a SIAS, CSAS, or AFAS signal alone. On a loss of offsite power, an

undervoltage/load-shed signal trips all vital loads and non-permanently connected loads from the vital bus. After the DG is connected to the vital bus, the vital loads are sequentially loaded to their respective vital bus by the ESF load sequencer. The sequencing logic controls the permissive and starting signals to each motor controller to prevent overloading the DG during this process.

During plant operation with both DGs operable, in the event of a loss of offsite power (LOP), the ESF electrical loads are automatically sequentially loaded to the DGs in sufficient time to provide for safe reactor shutdown or to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

The testing configuration for the performance of SR 3.8.1.10 (full load rejection test) and SR 3.8.1.14 (endurance and margin test), allows the DG being tested to be paralleled to the ESF transformer supplying each PB bus and thus offsite power. While the DG is paralleled, its operation could be affected by disturbances in the grid. As a result, during this alignment, additional protective trip devices are in service to protect the DG from the effects of system disturbances.

If the preferred power source is lost while paralleled to the diesel generator during testing, the diesel generator either trips on overcurrent or continues to run, depending upon if the resulting load is in excess of the diesel generator's load rating. If the load is excessive, the diesel generator will trip on overcurrent and the diesel generator breaker will trip automatically on a diesel generator shutdown signal. Upon detection of undervoltage on the Class 1E 4.16 kV bus (PB), load shedding for all vital loads and non-permanently connected loads from the vital bus would occur followed by re-sequencing of the vital loads back onto the affected PB bus. If the load does not exceed the diesel generator's load rating, the diesel generator continues to run and supply the PB bus. The operators receive indication and alarms in the control room that the preferred power source is lost. The DG auto-start and load sequence from a standby condition on a LOP is verified by SR 3.8.1.11 (simulated loss of offsite power test).

During testing, if a SIAS/CSAS or AFAS occurs while the diesel generator is paralleled to the preferred power supply with its control switch in the REMOTE or LOCAL position, the diesel generator breaker will be automatically tripped by a momentary tripping pulse. The diesel generator will continue running and automatically revert to the isochronous mode of operation. All non-critical protective devices are bypassed. If a non-critical trip occurs during testing, the diesel generator will trip. On a subsequent SIAS/CSAS, AFAS, or LOP, the diesel generator will automatically start and run in the isochronous mode.

Surveillance 3.8.1.17 verifies that the test mode is overridden for the DG running in test mode and connected to its bus upon the receipt of an emergency signal by opening the DG output breaker. Then the DG automatically reverts to the

emergency mode of operation and load sequencing of the required vital loads occurs onto the affected PB bus.

3.2 Description of Direct Current (DC) Power Source

PVNGS TS 3.8.4, "DC Sources – Operating," specifies requirements for electrical power distribution system DC sources. The Class 1E DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety-related equipment and backup 120 VAC vital bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 5), the Class 1E DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure.

The 125 VDC electrical power system consists of four independent safety-related Class 1E DC electrical power subsystems divided into two load groups (Train "A" and "B"). Each Class 1E DC electrical power train consists of two independent 125 VDC battery banks, a dedicated battery charger to each battery bank, and all the associated switchgear, control equipment, and interconnecting cabling. Each subsystem is located in an area separated physically and electrically from the other subsystems to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. Each battery is separately housed in a ventilated room apart from its charger and distribution center.

In addition, there are two backup battery chargers for the four Class 1E DC subsystems. One backup charger is shared between two Class 1E DC subsystems (Train "A"). The other backup charger is dedicated to the other two Class 1E DC subsystems (Train "B"). The backup chargers provide backup service in the event the preferred battery charger is out of service.

During normal operation, the 125 VDC loads are powered from the dedicated battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC loads are automatically powered from the station batteries.

Each of the DC electrical power subsystems provide the control power for their associated Class 1E AC power load group, 4.16 kV switchgear, and 480V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn are the primary power sources to the 120 VAC vital buses.

Each 125 VDC battery has adequate storage capacity to carry the required load for its associated bus continuously for at least 2 hours as discussed in the UFSAR, Chapter 8. Each DC electrical power subsystem has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient capacity to restore the battery

from the design minimum charge to its fully charged state within 12 hours while supplying normal steady state loads as discussed in the UFSAR, Chapter 8.

4.0 TECHNICAL ANALYSIS

MODE Restriction Elimination

The current TS Bases for SR 3.8.1.10, 3.8.1.14 and SR 3.8.1.20 state that the reason these SRs cannot be performed in Modes 1 and 2 is to prevent unnecessary perturbations to the electrical distribution systems that could challenge steady state operation and thus plant safety systems. In the current TS Bases, this risk is compared to the risk associated with a shutdown of the unit without the availability of a required DG. As a result, in the current TS, these SRs are not allowed to be performed in Mode 1 or 2.

The current TS Bases for SR 3.8.1.13 states that the reason for not performing this surveillance in Mode 1 or 2 is due to removing a required diesel from service.

The following technical analysis shows that although there is a minimal increase in risk involved with performing these SRs in Modes 1 and 2, that increase in risk is insignificant and acceptable.

4.1 SR 3.8.1.10 - Full Load Rejection Surveillance

The historical approach for performance of the load rejection test in SR 3.8.1.10 has been to parallel the DG with offsite power while the reactor is in Mode 5 or 6, manually raise the DG to the required 100% load, and then open the DG output breaker. Opening of the DG output breaker separates the DG from its associated vital bus and allows the offsite circuit to continue to supply that bus.

The current surveillance tests are performed in Mode 5 or 6, when only one of the two DGs and vital buses is required to be operable. Therefore, the current testing process does not require the DG and vital bus being tested to remain operable, even though the performance of this test does not require the DG to be declared inoperable. This LAR is proposing that this testing be also allowed in Mode 1, 2, 3 or 4 when both DGs are required to be operable per Technical Specification 3.8.1.

The concerns associated with performing the full load rejection test in Modes 1-4 are that the DG being tested is susceptible to damage caused by grid disturbances, disconnecting the DG while paralleled to the vital buses at 100% rated load might cause electrical system perturbations, and the DG in test is more susceptible to tripping due to the extra protective trip relays that are in effect during test mode operations.

Grid Disturbances

Only one DG per unit is paralleled to offsite power at any one time and any offsite grid disturbances would only possibly affect one operable DG. Therefore, the justification for this proposed change is based on the fact that the remaining DG would remain operable and is capable of mitigating a Design Base Accident (DBA). The onsite AC power system is fully capable of mitigating a DBA or providing for safe shutdown of the associated unit with the remaining DG operable.

Electrical Perturbations

Another concern during this testing is that suddenly disconnecting a DG from the associated bus on a full load rejection test would cause a voltage fluctuation on that bus that could potentially perturb the onsite AC electrical system. However, industry experience shows that there is no significant electrical distribution system effect on the associated bus during a full load rejection test. Furthermore, at PVNGS when the DG full load reject SR is performed at shutdown, the voltage transients experienced by the loads on the associated bus are considered minimal (an approximate 10 percent step change (400 VAC) in the bus voltage at the 4.16 kV level, with voltage recovery within 1 second. During this testing there were no recorded voltage oscillations and the voltage change was a smooth step change, which would have no adverse impact on equipment performance. Therefore, performing load reject tests in accordance with SR 3.8.1.10 in any modes would not cause a significant perturbation that would adversely affect the onsite AC electrical system.

Protective Trip Relays

During load rejection testing of DGs, non-emergency trip features are in effect to protect the DG from equipment damage due to equipment malfunction or offsite grid perturbations. If an ESF actuation emergency demand occurs with these non-emergency trips in effect, the affected DG will automatically revert to the emergency mode and bypass these trips. No operator action is required. If a LOP occurs during testing, the diesel generator either trips on overcurrent or continues to run, depending upon if the resulting load is in excess of the diesel generator's load rating. If the load is excessive, the diesel generator will trip on overcurrent and the diesel generator breaker will trip automatically on a DG shutdown signal. Upon detection of undervoltage on the Class 1E 4.16 kV (PB) bus, load shedding for all vital loads and non-permanently connected loads from the vital bus would occur followed by re-sequencing of the vital loads back onto the affected PB bus. If the load does not exceed the diesel generator's load rating, the diesel generator continues to run and supply the ESF bus. The operators receive indication and alarms in the control room that the preferred power source is lost.

Finally, the proposed test configuration for the full load rejection test is similar to the electrical alignment in the existing monthly run of the DG per SR 3.8.1.3, which is performed during Mode 1.

4.2 SR 3.8.1.13 Protective-Trip Bypass Test

SR 3.8.1.13 requires verification that non-emergency automatic trip features are bypassed and that the remaining emergency automatic trips will trip the DG as necessary to prevent severe damage to the DG.

This testing requires isolating all control air to the engine and manually initiating a generator overcurrent trip with the DG operating in the emergency mode and then verifying that the engine does not trip off and that the DG output breaker does not receive a trip signal. In addition, manual initiation of the emergency stop, generator differential, low lube oil engine pressure and overspeed trips are performed with the engine in standby and verifying that the engine will not start on depression of the simulated ESF and simulated LOP pushbuttons on the engine control panel.

The concerns while performing the non-emergency bypass trip test in Modes 1 and 2 are that DG unavailability would occur during part of the test.

DG Unavailability

Performing SR 3.8.1.13 in Mode 1 or 2 would still allow the DG in test to respond to an auto-start signal and load automatically. However, the DG would be unavailable to respond to emergency signals during the time that each of the emergency mode trips are placed in effect. For this test, the total DG unavailability would be approximately thirty (30) minutes. Based on the short time that a DG remains in this condition, this is considered an insignificant increase in unavailability.

Protective Trip Relays

During the time the non-emergency trip features are placed in effect (loss of control air and generator overcurrent trip), the DG is operating in the emergency mode and will effectively respond to any existing valid demands. Testing is only performed on one DG at a time and the other train DG remains fully operable at all times to respond as designed.

Therefore, performing the non-emergency bypass test online is not a significant concern because the other operable DG is capable of mitigating a DBA and the unavailability of the DG in test is minimal.

4.3 SR 3.8.1.14 - Endurance and Margin Test

The historical approach for performance of the endurance and margin test (24-hour load run) required by SR 3.8.1.14 has been to parallel the DG with

the offsite power source while the reactor is in Mode 5 or 6, then load the DG to 100% rated load for 22 consecutive hours followed by raising the load for the DG test to an overpower condition (110% of its full load rating) for the final two hours.

Current surveillance tests are performed in Mode 5 or 6, which require only one out of the two DGs to be operable. Thus, current testing does not require the DG being tested to remain operable, even though the performance of this test does not require the DG to be declared inoperable.

The concerns while performing the endurance and margin test in Modes 1 and 2 are the DG being tested is susceptible to grid disturbances and the additional protective trip features would be in place making the DG more vulnerable to a possible trip.

Grid Disturbances

A concern with performing the endurance and margin test in Modes 1 and 2, while connected to offsite power (grid), is that the DG is susceptible to grid disturbances. If a fault or power disturbance were to occur while a DG is paralleled to the offsite power system in the test mode of operation, the availability of the DG for subsequent emergency operation could be adversely affected due to the potential for common mode vulnerability. Information Notice (IN) 84-69 and Supplement 1 to IN 84-69 provide discussion on the possibility of a grid disturbance causing loss of the availability of the DG being tested because it is paralleled to the offsite power system and is susceptible to the same grid disturbances the offsite power system sees. This is acceptable because only one DG is required to be operable in Modes 5 and 6, and the other DG will remain operable to meet that requirement during testing.

In the case where a disturbance affects the DG being tested, protective devices (i.e., overcurrent relays, differential relays, reverse power) would protect the DG from equipment damage. These features will ensure that causing the DG output breaker to trip separating the DG from its associated ESF bus protects the DG. Assuming that the DG could be quickly restored from its protective device trip, making the DG available for restart could be done promptly via operator action.

As a common practice at PVNGS, risk management considerations would ensure that this and other SRs would not be scheduled during periods where the potential for grid or bus disturbance increases (storms, grid emergencies, etc.). On-line maintenance/testing scheduling and coordination of work activities at PVNGS is controlled as required by 10 CFR 50.65(a)(4). Performance of the endurance and margin test per SR 3.8.1.14, in Mode 1 or 2 is also justified, in part, by the fact that PVNGS currently tests its DGs paralleled to offsite power during required monthly surveillance testing, SR 3.8.1.3, while at power. SR 3.8.1.3 is required to be performed for a minimum of 60 minutes and is usually loaded for a four (4) hour duration. SR 3.8.1.14 is identical in setup and alignment to SR 3.8.1.3 and differs only

in the required duration and the 2-hour peak loading requirement of 110% of continuous rated load.

While the DG is paralleled to an offsite power source for testing several events that could affect the DG being tested are discussed below.

4.3.1 Loss of Offsite Power (LOP)

If a LOP occurs during testing, the diesel generator either trips on overcurrent or continues to run, depending upon if the resulting load is in excess of the diesel generator's load rating. If the load is excessive, the diesel generator will trip on overcurrent and the diesel generator breaker will trip automatically on a diesel generator shutdown signal. Upon detection of undervoltage on the Class 1E 4.16 kV (PB) bus, load shedding for all vital loads and non-permanently connected loads from the vital bus would occur followed by the DG re-energizing the vital PB bus and re-sequencing of the vital loads back onto the affected PB bus. If the load does not exceed the diesel generator's load rating, the diesel generator continues to run and supply the PB bus. The operators receive indication and alarms in the control room that the preferred power source is lost.

4.3.2 Loss of Coolant Accident (LOCA) / Auxiliary Feedwater Actuation (AFAS)

During testing, if an actual SIAS/CSAS or AFAS emergency signal occurs while the diesel generator is paralleled to the preferred power supply with the control switch in the REMOTE or LOCAL position, the diesel generator breaker will be automatically tripped by a momentary tripping pulse. The diesel generator will continue running and automatically revert to the emergency (isochronous) mode. All non-critical protective trip devices are bypassed during the emergency mode of operation.

If a non-critical trip occurs during testing, the diesel generator will trip. On a subsequent SIAS/CSAS, AFAS, or LOP, the diesel generator will automatically start and run in the isochronous mode.

The remaining DG that is in standby would operate normally. Therefore, both DGs would remain available to supply their respective 4.16kV vital buses if an actual emergency signal were to occur.

4.3.3 LOP with LOCA

In the case where a LOCA occurs before a LOP, the DG output breaker will trip open, the DG will revert to the emergency (isochronous) mode while running in standby and the DG output

breaker will reclose to the PB bus if a subsequent loss of power (LOP) condition is detected.

In the case where a LOP occurs before the LOCA, the DG will either continue to supply the PB bus and be placed into emergency (isochronous) operation by a subsequent ESF (LOCA) actuation or the DG would trip off on a generator overcurrent, restart on the loss of power (LOP) condition and reclose its output breaker onto the bus in the emergency mode. A subsequent ESF would then only result in additional equipment sequencing onto the DG.

During either of these LOP with LOCA scenarios the remaining DG will be available to respond and mitigate a DBA or provide safe shutdown capability.

Trip Relays

During test mode operation of DGs, non-emergency trip features provide additional protection for the DG. These protection features make a DG that is being tested more susceptible to tripping. However, if an emergency demand occurs while the DG is under testing, the DG automatically reverts back to the emergency mode without any operator intervention. Therefore, these additional trip functions are not a significant concern during performance of the endurance and margin tests while in Modes 1 and 2. In addition, the remaining DG will be available to respond and mitigate a DBA or provide safe shutdown capability.

4.4 Risk Assessment for Full Load Reject and the Endurance and Margin Tests in Modes 1 and 2

Currently when the full load reject and endurance and margin tests are performed they are performed in Modes 5 and 6. When a DG is undergoing the full load rejection test and the endurance and margin test, it is still considered operable and therefore available to respond to accident and LOP events.

Performing these tests in Modes 1, 2, 3, and 4 does not change the potential level of risk during these tests. As in Modes 5 and 6, the DG is available and capable of performing its safety functions. The determination of availability of the DG in test is consistent with the definition of unavailable in NUMARC 93-01, Revision 3, Appendix B, which states: "SSCs out of service for testing are considered unavailable, unless the test configuration is automatically overridden by a valid starting signal, or the function can be promptly restored either by an operator in the control room or by a dedicated operator stationed locally for that purpose. Restoration actions must be contained in a written procedure, must be uncomplicated (a single action or a few simple actions), and must not require diagnosis or repair...." Per the above discussion, for these tests the DG in test will remain available per

these guidelines. As a result, there is no increase in unavailability of the DG and there is a minimal increase in the risk.

4.5 SR 3.8.1.20 – DG Starting Independence Test

SR 3.8.1.20 simultaneously starts both diesel generators in one unit to demonstrate that the DG starting independence has not been compromised. This test is identical to that which is performed by SR 3.8.1.15 for one DG.

Grid Disturbances and Electrical Perturbations

During this testing neither diesel generator is connected to onsite or offsite power sources. Both diesel generators are started in standby only. Therefore, there is no possibility of any grid disturbances or electrical perturbations between the onsite or offsite power distribution systems and the diesel generators during the performance of this surveillance.

Protective Trip Relays

During this testing the diesel generators can be started in either the "test" or the "emergency" mode. If the simultaneous start occurs in the "test" mode, then all generator/engine protective trips would be in effect. If the simultaneous start occurs in the "emergency" mode, only the emergency trips are active with the diesel generator running in standby but the diesel generator can be returned to the "test" mode immediately, if necessary.

The deletion of this Note for SR 3.8.1.20 is consistent with NRC approved NUREG-1432, Rev. 2.

TSTF-283 Revision 3 Changes

The proposed change modifies the Notes in SRs 3.8.1.8 (transfer of AC sources test), 3.8.1.9 (single load rejection test), 3.8.1.11 (loss of offsite power test), 3.8.1.12 (safety injection actuation signal test), 3.8.1.16 (synchronizing test), 3.8.1.17 (test mode change-over test), 3.8.1.18 (engineered safety feature and auto-transfer load sequencing test), 3.8.1.19 (combined safety injection actuation signal and loss of offsite power test), 3.8.4.6 (battery charger test), 3.8.4.7 (battery service test), and 3.8.4.8 (battery discharge test) to allow performance of the surveillances in the prohibited modes in order to reestablish operability following corrective maintenance. The changes to these Notes are consistent with NRC approved change TSTF-283, Revision 3.

The TS Bases are also being revised to allow testing to reestablish operability provided an assessment is performed to assure plant safety is maintained or enhanced. The TS Bases are being updated consistent with TSTF-283 to provide the following guidance relative to this assessment: "This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed surveillance, a successful surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently

for the surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the surveillance, or portions of the surveillance, is performed in these normally restricted modes. Risk insights or deterministic methods may be used for this assessment."

Conclusion Summary

The proposed changes will provide the flexibility necessary to optimize both outage schedules and the utilization of resources, while still protecting the health and safety of the public and station personnel.

The following are summaries of the bases for these requested modifications and their acceptability:

Mode Restriction Elimination

SR 3.8.1.10 "Full Load Reject Test"

a) The testing is within the rating of all transformers, switchgear, and breakers, both before and after the load rejection;

b) Based on industry experience this evolution has had little impact on the plant electrical distribution system. PVNGS test results show bus voltage data during a full load reject test are not significant (within 10 percent step change) and would be unlikely to cause problems that would impact other buses;

c) The remaining DG will remain operable and can supply sufficient power to the bus.

SR 3.8.1.13 "Protective-Trip Bypass Test"

a) The DG would still be capable to respond to an auto-start signal except for when the emergency mode trips are placed in effect;

b) The unavailability of the DG during the conduct of this test is minimal.

SR 3.8.1.14 "Endurance and Margin Test"

a) The electrical alignment is similar to the existing monthly run of the DG, SR 3.8.1.3;

b) The remaining DG will remain operable and can supply sufficient power to the bus;

c) There is no increase in the DG unavailability and no increase in risk.

SR 3.8.1.20 "DG starting independence"

a) This test is identical to that of SR 3.8.1.15 except that both DGs would be performed at the same time;

b) There is no such MODE restriction to the performance of this SR contained in NUREG-1432, Rev. 2;

c) There is no increase in the DG unavailability during this test.

TSTF-283, Revision 3

a) Changes proposed in this LAR are identical to those in NRC approved TSTF-283;

b) Performance of these SRs during normally restricted modes will require an assessment to assure plant safety is maintained or enhanced;

c) Performance of these SRs during normally restricted modes will only be performed for the purpose of establishing operability.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

Arizona Public Service Company (APS) has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The emergency diesel generators (DGs) and their associated emergency loads are accident mitigating features, rather than accident initiating equipment. Each DG is dedicated to a specific vital bus and these buses and DGs are independent of each other. There is no common mode failure provided by the testing changes proposed in this license amendment request (LAR) that would cause multiple bus failures. Therefore, there will be no significant impact on any accident probabilities by the approval of the requested amendment.

The design of plant equipment is not being modified by these proposed changes.

The changes include an increase in the online time the DG will be paralleled to the grid in Mode 1, 2, 3, or 4. The overall time that the DG is paralleled in all modes (outage/non-outage) should remain unchanged. As such, the ability of the DGs to respond to a design basis accident (DBA) can be adversely impacted by these proposed changes. However, the impacts are not considered significant based on the DG under test maintaining its ability to respond to an auto-start signal were one to be received during testing, along with the ability of the remaining DG to mitigate a DBA or provide a safe shutdown, and data that shows that the DG itself will not perturb the electrical system significantly. Furthermore, the proposed amendments for surveillance requirements (SR) 3.8.1.10 and SR 3.8.1.14 share the same electrical configuration alignment to the current monthly 1-hour loaded surveillance.

For SR 3.8.1.13, the DG would still be able to respond to an auto-start signal were one to be received during testing. The unavailability of the DG during the conduct of this SR 3.8.1.13 is minimal (approx. 30 minutes) and is considered insignificant from a risk perspective.

In addition, operating experience and evaluation of the probability of a DG being rendered inoperable concurrent with or due to a significant grid disturbance, support the conclusion that the proposed changes in this LAR do not involve any significant increase in the likelihood of a safety-related bus blackout.

SR changes that are consistent with Industry/Technical Specification Task Force (TSTF) Standard Technical Specification (STS) change TSTF-283, Revision 3 and NUREG-1432, Revision 2 have been approved by the NRC, and the on-line tests allowed by the TSTF and the NUREG are only to be performed for the purpose of establishing operability. Performance of these SRs during previously restricted modes will require an assessment to assure plant safety is maintained or enhanced.

The deletion of the footnote associated with SR 3.8.4.8 is an editorial change. This footnote was associated with coming out of the ninth refueling outage for Unit 1, which has since passed.

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

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

Response: No.

The proposed change would create no new accidents since no changes are being made to the plant that would introduce any new accident causal mechanisms. Equipment will be operated in the same configuration currently allowed by other DG SRs that allow testing in plant Modes 1, 2, 3, and 4. This

license amendment request does not impact any plant systems that are accident initiators or adversely impact any accident mitigating systems.

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

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

Response: No.

The proposed change does not involve a significant reduction in a margin of safety. The margin of safety is related to the ability of the fission product barriers to perform their design functions during and following an accident situation. These barriers include the fuel cladding, the reactor coolant system, and the containment system. The proposed changes to the testing requirements for the plant DGs do not affect the operability requirements for the DGs, as verification of such operability will continue to be performed as required (except during different allowed modes). Continued verification of operability supports the capability of the DGs to perform their required function of providing emergency power to plant equipment that supports or constitutes the fission product barriers. Only one DG is tested at a time and the remaining DG will be available to safely shutdown the plant or respond to a DBA, if required. Consequently, the performance of these fission product barriers will not be impacted by implementation of this proposed amendment.

In addition, the proposed changes involve no changes to setpoints or limits established or assumed by the accident analysis. On this and the above basis, no safety margins will be impacted.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, APS concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements

10 CFR 50, Appendix A, GDC 17, "Electric power systems," requirements are summarized below:

> "Onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the

other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

Electric power from.....

Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies."

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 for each unit is divided into two load groups so that the loss of any one group does not prevent the minimum safety functions from being performed. Each of these load groups or buses has connections to offsite power sources and a single dedicated DG. Offsite power is supplied to the 525 kV switchyard from the offsite transmission networks. The 525 kV sources are stepped down to 13.8 kV through three Startup Transformers, which are shared amongst the three PVNGS units. From the 525 kV switchyard there are two sources which are electrically and physically separated circuits that provide AC power at 4.16 kV through ESF service transformers fed by the 13.8kV Startup Transformer sources, to the Class 1E distribution system.

The potential for failure of the endurance and margin test exists principally in the DG, which is under test. The remaining DG will remain operable and in a standby condition during the performance of SR 3.8.1.14 and is not susceptible to a common grid disturbance and a common cause failure.

APS recognizes that the affected train of the emergency power system is not independent of disturbances on the offsite power system and any potential interaction with the DG. However, the low probability of having a DG in test concurrent with a significant grid disturbance support the conclusion that the proposed changes in this LAR do not involve any significant increase in the likelihood of a vital bus blackout. During the performance of SR 3.8.1.10 and SR 3.8.1.14 the paralleled DG will be considered operable for the majority of the testing period. The remaining DG will also remain operable. Furthermore, testing will not be performed under adverse external plant conditions (storms, high grid emergencies, etc.) per risk management operation procedures.

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.

6.0 ENVIRONMENTAL CONSIDERATION

APS has evaluated the proposed amendments and determined the proposed amendments do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendments meet 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 amendments.

7.0 REFERENCES

1. 10 CFR 50.90 "Application for amendment of license or construction permit"
2. TSTF-283, Revision 3 "Modify Section 3.8 Mode restriction Notes"
3. Regulatory Guide 1.174 "An Approach for using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis"
4. 10 CFR 50.36(a) "Technical Specifications"
5. 10 CFR, Appendix A, GDC 17 "General Design Criteria for Nuclear Power Plants - Electric Power Systems"
6. Information Notice (IN) 84-69 "Operation of Emergency Diesel Generators"
7. Information Notice (IN) 84-69, Supplement 1 "Operation of Emergency Diesel Generators"
8. NUMARC 93-01, Revision 3, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"

8.0 PRECEDENT

The NRC issued License Amendment 173, Subject: Columbia Generating Station Operating License NPF-21 Request for Technical Specifications Amendment to Remove Operating Mode Restrictions for Emergency Diesel Generator Surveillance Testing, dated May 18, 2001

Enclosure 2

MARKED-UP TECHNICAL SPECIFICATION PAGES

Units 1, 2, and 3;

Pages:

3.8.1-8 through 3.8.1-17
3.8.4-3 through 3.8.4-4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	----------NOTE---------- 1. All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. 2. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify each DG starts from standby condition and achieves a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4000 V and ≤ 4377.2 V, and frequency ≥ 59.7 Hz and ≤ 60.7 Hz.	184 days normally
SR 3.8.1.8	----------NOTE---------- This Surveillance shall not be performed in MODE 1 or 2. ---------- Insert 1 Verify manual transfer of AC power sources from the normal offsite circuit to each alternate offsite circuit.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.9	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ----------	
	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 ≤ 64.5 Hz; b. Within 3 seconds following load rejection, the voltage is ≥ 3740 V and ≤ 4580 V; and c. Within 3 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.10	----------~~NOTE~~---------- ~~This Surveillance shall not be performed in MODE 1 or 2.~~ ----------	
	Verify each DG does not trip, and voltage is maintained ≤ 6200 V during and following a load rejection of ≥ 4950 kW and ≤ 5500 kW.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.11 ----------NOTE---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. 3. Momentary voltage and frequency transients induced by load changes do not invalidate this test. 4. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- 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 and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through automatic load sequencer, 3. maintains steady state voltage ≥ 4000 V and ≤ 4377.2 V, 4. maintains steady state frequency ≥ 59.7 Hz and ≤ 60.7 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months

normally

Insert 2

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.12 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. 3. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal (without a loss of offsite power) each DG auto-starts and: a. In ≤ 10 seconds, achieves voltage ≥ 3740 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 4000 and ≤ 4377.2 V and frequency ≥ 59.7 Hz and ≤ 60.7 Hz; c. Operates for ≥ 5 minutes on standby (running unloaded); d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized (auto-connected through the automatic load sequencer) from the offsite power system.	18 months

normally

Insert 2

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	~~----------NOTE----------~~ ~~This Surveillance shall not be performed in MODE 1 or 2.~~ ---------- Verify each DG automatic trip is bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal except: a. Engine overspeed; b. Generator differential current; c. Engine low lube oil pressure; and d. Manual emergency stop trip.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.14 ----------NOTES---------- 1. Momentary transients outside the load range do not invalidate this test. ~~2. This Surveillance shall not be performed in MODE 1 or 2.~~ 2. ~~3.~~ All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. 3. ~~4.~~ DG loading may include gradual loading as recommended by the manufacturer. ---------- Verify each DG operates for ≥ 24 hours: a. For ≥ 22 hours loaded ≥ 4950 kW and ≤ 5500 kW; and b. For the remaining hours (≥ 2) of the test loaded ≥ 5775 kW and ≤ 6050 kW.	18 months

Continued

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG, loaded ≥ 4950 kW and ≤ 5500 kW, has operated ≥ 2 hours or until temperatures have stabilized. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. 3. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify each DG starts and achieves a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4000 V and ≤ 4377.2 V, and frequency ≥ 59.7 Hz and ≤ 60.7 Hz.	18 months
SR 3.8.1.16	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ---------- Insert 1 ---------- 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

normally

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.17	----------NOTE---------- (normally) This Surveillance shall not be performed in MODE 1, 2, 3, or 4. (Insert 2) ---------- Verify, with a 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---------- (normally) This Surveillance shall not be performed in MODE 1, 2, 3, or 4. (Insert 1) ---------- Verify interval between each sequenced load block is within ± 1 second of design interval for each automatic load sequencer.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. **normally** 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. **Insert 2** 3. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- 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. DG auto-starts 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 ≥ 4000 V and ≤ 4377.2 V, 4. achieves steady state frequency ≥ 59.7 Hz and ≤ 60.7 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.20 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. ~~2. This Surveillance shall not be performed in MODE 1 or 2.~~ 2. ~~3.~~ The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify, when started simultaneously, each DG achieves a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4000 V and ≤ 4377.2 V, and frequency ≥ 59.7 Hz and ≤ 60.7 Hz.	10 years

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.4.6	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4 on the charger credited for OPERABILITY. ----------	18 months
	Verify each battery charger supplies ≥ 400 amps for Batteries A and B and ≥ 300 amps for Batteries C and D at ≥ 125 V for ≥ 8 hours.	
SR 3.8.4.7	----------NOTES---------- 1. The battery performance discharge test or the modified performance discharge test in SR 3.8.4.8 may be performed in lieu of the service test in SR 3.8.4.7. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ----------	18 months
	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	

normally

Insert 2

normally

Insert 2

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.8	----------NOTE---------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. normally Insert 2 ---------- Verify battery capacity is ≥ 80% (low specific gravity cells) or ≥ 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. ~~*~~	60 months AND 12 months when battery shows degradation or has reached 85% of the expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

~~* The requirement to perform SR 3.8.4.8 for the Unit 1 batteries A, B, and C is waived until entry into MODE 4 coming out of the ninth refueling outage for Unit 1 (1R09).~~

Insert 1

However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Insert 2

However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Attachment 2

RETYPED TECHNICAL SPECIFICATION PAGE

Units 1, 2, and 3;

Pages:

3.8.1-8 through 3.8.1-17
3.8.4-3 through 3.8.4-4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	----------NOTE---------- 1. All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. 2. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify each DG starts from standby condition and achieves a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4000 V and ≤ 4377.2 V, and frequency ≥ 59.7 Hz and ≤ 60.7 Hz.	184 days
SR 3.8.1.8	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify manual transfer of AC power sources from the normal offsite circuit to each alternate offsite circuit.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- 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 ≤ 64.5 Hz; b. Within 3 seconds following load rejection, the voltage is ≥ 3740 V and ≤ 4580 V; and c. Within 3 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.10	Verify each DG does not trip, and voltage is maintained ≤ 6200 V during and following a load rejection of ≥ 4950 kW and ≤ 5500 kW.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTE---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. 3. Momentary voltage and frequency transients induced by load changes do not invalidate this test. 4. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- 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 and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through automatic load sequencer, 3. maintains steady state voltage ≥ 4000 V and ≤ 4377.2 V, 4. maintains steady state frequency ≥ 59.7 Hz and ≤ 60.7 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. 3. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal (without a loss of offsite power) each DG auto-starts and: a. In ≤ 10 seconds, achieves voltage ≥ 3740 V and frequency ≥ 58.8 Hz; b. Achieves steady state voltage ≥ 4000 and ≤ 4377.2 V and frequency ≥ 59.7 Hz and ≤ 60.7 Hz; c. Operates for ≥ 5 minutes on standby (running unloaded); d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized (auto-connected through the automatic load sequencer) from the offsite power system.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.13 Verify each DG automatic trip is bypassed on actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal except: a. Engine overspeed; b. Generator differential current; c. Engine low lube oil pressure; and d. Manual emergency stop trip.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. 3. DG loading may include gradual loading as recommended by the manufacturer. ---------- Verify each DG operates for ≥ 24 hours: a. For ≥ 22 hours loaded ≥ 4950 kW and ≤ 5500 kW; and b. For the remaining hours (≥ 2) of the test loaded ≥ 5775 kW and ≤ 6050 kW.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG, loaded ≥ 4950 kW and ≤ 5500 kW, has operated ≥ 2 hours or until temperatures have stabilized. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. 3. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify each DG starts and achieves a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4000 V and ≤ 4377.2 V, and frequency ≥ 59.7 Hz and ≤ 60.7 Hz.	18 months
SR 3.8.1.16	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- 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 normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify, with a 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---------- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify interval between each sequenced load block is within ± 1 second of design interval for each automatic load sequencer.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. 3. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- 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. DG auto-starts 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 ≥ 4000 V and ≤ 4377.2 V, 4. achieves steady state frequency ≥ 59.7 Hz and ≤ 60.7 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. The steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument error. ---------- Verify, when started simultaneously, each DG achieves a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4000 V and ≤ 4377.2 V, and frequency ≥ 59.7 Hz and ≤ 60.7 Hz.	10 years

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.6	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4 on the charger credited for OPERABILITY. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify each battery charger supplies ≥ 400 amps for Batteries A and B and ≥ 300 amps for Batteries C and D at ≥ 125 V for ≥ 8 hours.	18 months
SR 3.8.4.7	----------NOTES---------- 1. The battery performance discharge test or the modified performance discharge test in SR 3.8.4.8 may be performed in lieu of the service test in SR 3.8.4.7. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.4.8	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ---------- Verify battery capacity is ≥ 80% (low specific gravity cells) or ≥ 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	60 months AND 12 months when battery shows degradation or has reached 85% of the expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

Enclosure 3

MARKED-UP TECHNICAL SPECIFICATION BASES PAGES

(for information only)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from its associated storage tank to its associated day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

Since the design of the fuel transfer system is such that pumps will operate automatically in order to maintain an adequate volume of fuel oil in the day tank during or following DG testing, a 31 day Frequency is appropriate.

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the auto-connected emergency loads. The 18 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit 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 could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems.

Insert A

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

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, or equivalent load, without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. Train A Normal Water Chiller (at 842 kW) and Train B AFW pump (at 936 kW) are the bounding loads for the DG A and DG B to reject, respectively. These values were established in reference 14. This Surveillance may be accomplished by:

a. Tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while solely supplying the bus; or

b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

As required by IEEE-308 (Ref. 11), 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 the voltage and frequency values the system must meet, within three seconds, following load rejection. The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.9 (Ref. 3).

No changes to this page

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

This SR is modified by a Note. The reason for the Note is that performing this SR would remove a required offsite circuit from service, perturb the EDS, and challenge safety systems. This SR is performed in emergency mode (not paralleled to the grid) ensuring that the DG is tested under load conditions that are as close to design basis conditions as possible.

SR 3.8.1.10

Insert B

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 will not trip upon loss of the load. These acceptance criteria provide 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 is performed using design basis kW loading and maximum kVAR loading permitted during testing. These loads represent the inductive loading that the DG would experience to the extent practicable and is consistent with the guidance of Regulatory Guide 1.9 (Ref. 3). Consistent with the guidance provided in the Regulatory Guide 1.9 full-load rejection test description, the 4950 - 5500 kW band will demonstrate the DG's capability to reject a load equal to 90 to 100 percent of its continuous rating. Administrative limits have been placed upon the Class 1E 4160 V buses due to high voltage concerns. As a result power factors deviating much from unity are currently not possible when the DG runs parallel to the grid. To the extent practicable, VARs will be provided by the DG during this SR.

The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.8 (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 could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems.~~

SR 3.8.1.11

As required by Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.4, 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 auto-start time of 10 seconds is derived from requirements of the accident analysis. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved.

The requirement to verify the connection and power supply of permanent and auto-connected emergency 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, high pressure injection systems are not capable of being operated at full flow, or shutdown cooling (SDC) 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 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 to the extent possible ensuring power is available to the component.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

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

This SR is modified by four Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. Note 3 states that momentary voltage and frequency transients induced by load changes do not invalidate this test. Note 4 states that the steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument accuracy. The analyzed values for the steady-state diesel generator voltage limits are ≥ 4000 and ≤ 4377.2 volts and the analyzed values for the steady-state diesel generator frequency limits are ≥ 59.7 and ≤ 60.7 hertz. The indicated steady state diesel generator voltage and frequency limits, using the panel mounted diesel generator instrumentation and adjusted for instrument error, are ≥ 4080 and ≤ 4300 volts (Ref. 12), and ≥ 59.9 and ≤ 60.5 hertz (Ref. 13), respectively. If digital Maintenance and Testing Equipment (M&TE) is used instead of the panel mounted diesel generator instrumentation, the instrument error may be reduced, increasing the range for the indicated steady state voltage and frequency limits.

Insert C

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 accident signal (LOCA) signal, and subsequently achieves steady state required voltage and frequency ranges, and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and auto-connected emergency loads (auto-connected through the automatic load sequencer) are energized from the offsite electrical power system on an ESF signal without loss of offsite power.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

The requirement to verify the connection of permanent and auto-connected emergency loads is intended to satisfactorily show the relationship of these loads to the offsite circuit 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, high pressure injection systems are not capable of being operated at full flow, or SDC 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 offsite circuit 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 to the extent possible ensuring power is available to the component.

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the 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.

Insert C

This SR is modified by three Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. The reason for Note 2 is that performing this SR would remove a required offsite circuit from service, perturb the EDS, and challenge safety systems. Note 3 states that the steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument accuracy. The analyzed values for the steady-state diesel generator voltage limits are ≥ 4000 and ≤ 4377.2 volts and the analyzed values for the steady-state diesel generator frequency limits are ≥ 59.7 and ≤ 60.7 hertz. The indicated steady state diesel generator voltage and frequency limits, using the panel mounted diesel generator instrumentation and adjusted for instrument error are ≥ 4080 and ≤ 4300 volts (Ref. 12), and ≥ 59.9 and ≤ 60.5 hertz (Ref. 13), respectively. If digital Maintenance and Testing Equipment (M&TE) is used instead of the panel mounted diesel generator instrumentation, the instrument error may be reduced, increasing the range for the indicated steady state voltage and frequency limits.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

This Surveillance demonstrates that DG and its associated 4.16 KV output breaker noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal, and critical protective functions (engine overspeed, generator differential current, engine low lube oil pressure, and manual emergency stop trip), trip the DG to avert substantial damage to the DG unit. 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 unit 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 a required DG from service.~~

SR 3.8.1.14

Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.9, requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ 2 hours of which is at a load equivalent to 105 to 110% of the continuous rating of the DG (5775 - 6050 kW) and ≥ 22 hours at a load equivalent to 90 to 100% of the continuous duty rating of the DG (4950 - 5500 kW). The DG starts for this Surveillance can be performed either from normal keep-warm or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR (Note ~~3~~ 2 and Note ~~4~~ 3).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.14 (continued)

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing is performed using design basis kW loading and maximum kVAR loading permitted during testing. These loads represent the inductive loading that the DG would experience to the extent practicable and is consistent with the intent of Regulatory Guide 1.9 (Ref. 3). Administrative limits have been placed upon the Class 1E 4160 V buses due to high voltage concerns. As a result, power factors deviating much from unity are currently not possible when the DG runs parallel to the grid. To the extent practicable, VARs will be provided by the DG during this SR. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.9, takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by ~~four~~ three Notes. Note 1 states that momentary variations due to changing bus loads do not invalidate the test. ~~The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems.~~ The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR (Note ~~3~~ 2 and Note ~~4~~ 3).

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 10 seconds, and subsequently achieves steady state required voltage and frequency ranges. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.10.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

This SR is modified by three Notes. Note 1 ensures 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. Per the guidance in Regulatory Guide 1.9, this SR would demonstrate the hot restart functional capability at full-load temperature conditions, after the DG has operated for 2 hours (or until operating temperatures have stabilized) at full load. Momentary transients due to changing bus loads do not invalidate the test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing. Note 3 states that the steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument accuracy. The analyzed values for the steady-state diesel generator voltage limits are ≥ 4000 and ≤ 4377.2 volts and the analyzed values for the steady-state diesel generator frequency limits are ≥ 59.7 and ≤ 60.7 hertz. The indicated steady state diesel generator voltage and frequency limits, using the panel mounted diesel generator instrumentation and adjusted for instrument error, are ≥ 4080 and ≤ 4300 volts (Ref. 12), and ≥ 59.9 and ≤ 60.5 hertz (Ref. 13), respectively. If digital Maintenance and Testing Equipment (M&TE) is used instead of the panel mounted diesel generator instrumentation, the instrument error may be reduced, increasing the range for the indicated steady state voltage and frequency limits.

SR 3.8.1.16

As required by Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.11, this Surveillance ensures that the manual synchronization and load transfer from the DG to the offsite source can be made and that the DG can be returned to ready-to-load status when offsite power is restored. It also ensures that the auto-start 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, in standby operation (running unloaded), the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

No changes to this page

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.16 (continued)

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

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.

Insert B

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 (e.g., simulated SIAS) is received during operation in the test mode. Ready-to-load operation is defined as the DG running at rated speed and voltage, in standby operation (running unloaded) with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 12), paragraph 6.2.6(2) and Regulatory Guide 1.9 (Ref. 3), paragraph 2.2.13.

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), takes into consideration unit 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.

Insert C

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

Under accident and loss of offsite power conditions loads are sequentially connected to the bus 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 1 second load sequence time tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. FSAR, Chapter 8 (Ref. 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), paragraph 2.2.4, takes into consideration unit 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.

Insert B

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.

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

This SR is modified by three Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. Note 3 states that the steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument accuracy. The analyze values for the steady-state diesel generator voltage limits are ≥ 4000 and ≤ 4377.2 volts and the analyzed values for the steady-state diesel generator frequency limits are ≥ 59.7 and ≤ 60.7 hertz. The indicated steady state diesel generator voltage and frequency limits, using the panel mounted diesel generator instrumentation and adjusted for instrument error, are ≥ 4080 and ≤ 4300 volts (Ref.12), and ≥ 59.9 and ≤ 60.5 hertz (Ref.13), respectively. If digital Maintenance and Testing Equipment (M&TE) is used instead of the panel mounted diesel generator instrumentation, the instrument error may be reduced, increasing the range for the indicated steady state voltage and frequency limits

Insert C

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can proper speed within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), paragraph 2.3.2.4 and Regulatory Guide 1.137 (Ref. 9).

This SR is modified by ~~three~~ two Notes. The reason for Note 1 is to minimize wear on the DG during testing. ~~The reason for Note 2 is that during operation with the reactor critical, performance of this SR could cause perturbations to the EDS that could challenge continued steady state operation and, as a result, unit safety systems.~~ Note ~~3~~ 2 states that the steady state voltage and frequency limits are analyzed values and have not been adjusted for instrument accuracy. The analyzed values for the steady-state diesel generator voltage limits are ≥ 4000 and

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.4 and SR 3.8.4.5

Visual inspection and resistance measurements of inter-cell, inter-rack, inter-tier, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anticorrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection. The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during performance of SR 3.8.4.4.

The connection resistance limits for SR 3.8.4.5 is based on calculation 1,2,3ECPK207 which states that if every terminal connection were to degrade to 150E-6 ohms there would be sufficient battery capacity to satisfy the DBA Duty Cycle (Ref. 13).

The Surveillances are consistent with IEEE-450 (Ref. 9), which recommends cell to cell and terminal connection resistance measurement. The 18 month Surveillance Frequency is consistent with expected fuel cycle length, minimizing battery testing while on line that could result in rendering the batteries inoperable.

SR 3.8.4.6

This SR requires that each required battery charger be capable of supplying 400 amps for batteries A and B and 300 amps for batteries C and D, and 125 V for ≥ 8 hours. These requirements are based on the design capacity of the chargers (Ref. 4). According to Regulatory Guide 1.32 (Ref. 10), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

No changes to this page

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.4.6 (continued)

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle length.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance on the charger credited for OPERABILITY would perturb the electrical distribution system and challenge safety systems.

Insert C

SR 3.8.4.7

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 10) and Regulatory Guide 1.129 (Ref. 11), which state that the battery service test should be performed during refueling operations, or at some other outage, with intervals between tests not to exceed 18 months.

This SR is modified by two Notes. Note 1 allows the performance of a battery performance discharge test or a modified performance discharge test in SR 3.8.4.8 in lieu of a service test since both performance discharge test parameters envelope the service test. The reason for Note 2 is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems.

SR 3.8.4.8

Insert C

A battery performance discharge test is a test of constant current capacity of a battery, normally done in the "as found" condition, after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.4.8 (continued)

The modified performance discharge test is a simulated duty cycle consisting of just two rates: the one minute rate published for the battery or the largest current load of the duty cycle (but in no case lower than the performance test rate), followed by the test rate employed for the performance test, both of which envelope the duty cycle of the service test. Since the ampere-hours removed by a rated one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test.

A modified discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test.

Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.4.8. In addition, either of the performance discharge tests may be used to satisfy SR 3.8.4.8 while satisfying the requirements of SR 3.8.4.7 at the same time, because the test parameters envelope the service test described in SR 3.8.4.7.

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 9) and IEEE-485 (Ref. 5). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer rating. A capacity of 80% (low specific gravity cells) or 90% (AT&T) shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements.

The Surveillance Frequency for this test is normally 60 months. If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected

No changes to this page

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.4.8 (continued)

life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated when the battery capacity drops by more than 10% (low specific gravity cells) or 5% (AT&T) relative to its capacity on the previous performance test, or when it is ≥ 10% (low specific gravity cells) or ≥ 5% (AT&T) below the manufacturer's rating.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems.

Insert C

REFERENCES

1. 10 CFR.50, Appendix A, GDC 17.
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE-308-1974.
4. UFSAR, Chapter 8.3.2.
5. IEEE-485-1983, June 1983.
6. UFSAR, Chapter 6.
7. UFSAR, Chapter 15.
8. Regulatory Guide 1.93, December 1974.
9. IEEE-450-1980.
10. Regulatory Guide 1.32, Revision 0, August 11, 1972.
11. Regulatory Guide 1.129, Revision 1, February 1978.
12. Design Basis Manual "Class 1E 125 VDC Power System".
13. Calculation 1,2,3ECPK207

(continued)

Technical Specification Bases INSERTS

Insert A

This restriction from normally performing the surveillance in MODE 1 or 2 is further amplified to allow the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed surveillance, a successful surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

Insert B

This restriction from normally performing the surveillance in MODE 1, 2, 3, and 4 is further amplified to allow the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed surveillance, a successful surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the surveillance is performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment.

Insert C

This restriction from normally performing the surveillance in MODE 1, 2, 3, and 4 is further amplified to allow portions of the surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial surveillance, a successful partial surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment.