

February 3, 2022

TSTF-22-01
PROJ0753

Attn: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Transmittal of TSTF-589, Revision 0, "Eliminate Automatic Diesel Generator Start During Shutdown"

Enclosed for NRC review is TSTF-589, Revision 0, "Eliminate Automatic Diesel Generator Start During Shutdown."

The following information is provided to assist the NRC staff in prioritizing their review of TSTF-589:

- **Applicability:** TSTF-589 is applicable to Pressurized Water Reactors (PWRs).
- **Classification:** TSTF-589 revises the Technical Specifications requirements for automatic diesel generator (DG) start and loading during shutdown.
- **Specialized Resource Availability:** TSTF-589 is a normal priority change. The TSTF requests that TSTF-589 be reviewed within 18 months and be made available for adoption under the Consolidated Line Item Improvement Process (CLIIP).

The Technical Specifications Task Force should be billed for the review of the traveler.

Should you have any questions, please do not hesitate to contact us.



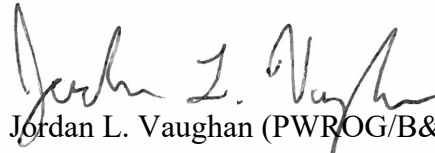
Andrew M. Richards, Jr. (PWROG/W)



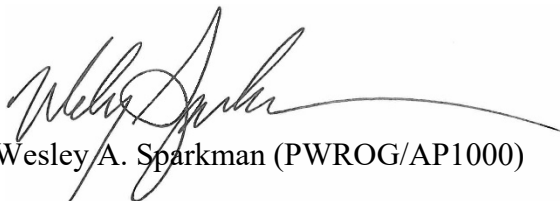
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cc: Michelle Honcharik, Technical Specifications Branch
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Technical Specifications Task Force Improved Standard Technical Specifications Change Traveler

Eliminate Automatic Diesel Generator Start During Shutdown

NUREGs Affected: 1430 1431 1432 1433 1434 2194

Classification: 1) Technical Change

Recommended for CLIP?: Yes

Correction or Improvement: Improvement

NRC Fee Status: Not Exempt

Benefit: Reduces Testing

Changes Marked on ISTS Rev 5.0

PWROG RISD & PA (if applicable): PA-LSC-1856 RS-2020-033

See attached.

Revision History

OG Revision 0

Revision Status: Active

Revision Proposed by: PWROG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 13-Aug-21

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 24-Sep-21

TSTF Review Information

TSTF Received Date: 19-Jan-22

Date Distributed for Review 19-Jan-22

TSTF Comments:
(No Comments)

TSTF Resolution: Approved

Date: 02-Feb-22

NRC Review Information

NRC Received Date: 03-Feb-22

Affected Technical Specifications

LCO 3.8.2 Bases AC Sources - Shutdown

03-Feb-22

SR 3.8.2.1	AC Sources - Shutdown	
SR 3.8.2.1 Bases	AC Sources - Shutdown	
LCO 3.3.8 Bases	EDG LOPS	NUREG(s)- 1430 Only
Appl. 3.3.8	EDG LOPS	NUREG(s)- 1430 Only
Appl. 3.3.8 Bases	EDG LOPS	NUREG(s)- 1430 Only
Action 3.3.8.C Bases	EDG LOPS	NUREG(s)- 1430 Only
LCO 3.3.5 Bases	LOP DG Start Instrumentation	NUREG(s)- 1431 Only
Appl. 3.3.5	LOP DG Start Instrumentation	NUREG(s)- 1431 Only
Appl. 3.3.5 Bases	LOP DG Start Instrumentation	NUREG(s)- 1431 Only
Action 3.3.5.C Bases	LOP DG Start Instrumentation	NUREG(s)- 1431 Only
LCO 3.3.6 Bases	DG - LOVS (Analog)	NUREG(s)- 1432 Only
Appl. 3.3.6	DG - LOVS (Analog)	NUREG(s)- 1432 Only
Appl. 3.3.6 Bases	DG - LOVS (Analog)	NUREG(s)- 1432 Only
Action 3.3.6.D Bases	DG - LOVS (Analog)	NUREG(s)- 1432 Only
LCO 3.3.7 Bases	DG - LOVS (Digital)	NUREG(s)- 1432 Only
Appl. 3.3.7	DG - LOVS (Digital)	NUREG(s)- 1432 Only
Appl. 3.3.7 Bases	DG - LOVS (Digital)	NUREG(s)- 1432 Only
Action 3.3.7.D Bases	DG - LOVS (Digital)	NUREG(s)- 1432 Only

1. SUMMARY DESCRIPTION

The proposed change eliminates the Technical Specifications (TS) requirements for automatic diesel generator (DG) start and loading during shutdown. The proposed change affects the Standard Technical Specifications (STS) in NUREG-1430, NUREG-1431, and NUREG-1432.¹

2. DETAILED DESCRIPTION

2.1. System Design and Operation

The design of the Class 1E alternating current (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 electrical power system includes offsite power sources and onsite standby power sources (i.e., DGs) that supply electrical power to the plant load groups, with each load group powered by an independent Class 1E ESF bus. Each ESF bus has connections to offsite power sources and one or more DGs.

A DG starts automatically on a loss of offsite power signal or an ESF actuation signal. After the DG starts, it automatically ties to its respective bus independent of or coincident with an ESF signal. In the event of a loss of offsite power (LOOP), the ESF electrical loads are automatically connected to the DG in time to provide for safe reactor shutdown and to mitigate the consequences of a design basis accident.

Depending on the plant design, during shutdown conditions the DG automatic start may be initiated by a loss of power signal. However, during shutdown the analyzed accidents do not assume a concurrent loss of offsite power.

2.2. Current Technical Specifications Requirements

2.2.1. DG Loss of Power Start

The STS contains requirements for instrumentation that detects a loss of normal power and signals the DGs to start. They are:

- NUREG-1430 (B&W plants) TS 3.3.8, "Emergency Diesel Generator (EDG) Loss of Power Start (LOPS);"
- NUREG-1431 (Westinghouse plants) TS 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation;"

¹ NUREG-1430 provides the STS for Babcock & Wilcox plant designs.
NUREG-1431 provides the STS for Westinghouse plant designs.
NUREG-1432 provides the STS for Combustion Engineering plant designs.

- NUREG-1432 (CE analog plants) TS 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS) (Analog)," and
- NUREG-1432 (CE digital plants) TS 3.3.7, "Diesel Generator (DG) - Loss of Voltage Start (LOVS) (Digital)"

These specifications will be referred to generically in this document as Loss of Power. The specifications are applicable in Modes 1, 2, 3, and 4, and when the associated DG is required to be operable by Limiting Condition for Operation (LCO) 3.8.2, "AC Sources - Shutdown."

Plants that have TS not based on the STS have Loss of Power requirements similar to the STS, typically in the Engineered Safety Feature Actuation System (ESFAS) Instrumentation TS. In some plant's TS the Applicability for each DG Loss of Power function is listed in a function table.

2.2.2. AC Sources - Shutdown

The STS contain requirements on AC sources while shutdown in TS 3.8.2, "AC Sources - Shutdown."

The STS LCO requires an offsite source and a DG to be operable. Some plant-specific TS have variations on the LCO requirements, such as requiring multiple offsite sources or DGs to be operable, and some contain requirements on load shedding and load sequencing equipment. Some multiple-unit plant-specific TS require support for opposite unit operating plant equipment. Non-STS plant TS LCOs also include diesel fuel oil requirements.

The STS 3.8.2 specification is applicable in Modes 5 and 6 and during movement of irradiated or recently irradiated fuel assemblies. Some plant TS are not applicable during movement of irradiated or recently irradiated fuel assemblies.

STS TS 3.8.1, "AC Sources - Operating," contains requirements on AC sources (offsite power and DGs) in Modes 1, 2, 3, and 4. STS 3.8.1 contains twenty Surveillance Requirements (SRs). STS SR 3.8.2.1 states that all of the TS 3.8.1 SRs are applicable except for a list of excepted SRs. STS SR 3.8.2.1 also has a Note that lists the TS 3.8.1 SRs that must be met but are not required to be performed². Plant-specific TS 3.8.1 may not include all of the SRs in the STS or may contain SRs that do not appear in the STS in order to reflect the plant's design and licensing basis.

Plant-specific equivalents of SR 3.8.2.1 have several variations, the most common being the listing of the TS 3.8.1 SRs that are applicable instead of listing the TS 3.8.1 SRs that are not

² As described in STS 1.4, "Frequency," "The use of 'met' or 'performed' in these instances conveys specific meanings. A Surveillance is 'met' only when the acceptance criteria are satisfied. Known failure of the requirements of a Surveillance, even without a Surveillance specifically being 'performed,' constitutes a Surveillance not 'met.' 'Performance' refers only to the requirement to specifically determine the ability to meet the acceptance criteria."

applicable. The plant-specific equivalent of SR 3.8.2.1 may require different TS 3.8.1 SRs to be met or performed than the STS. Some plant-specific requirements explicitly exempt load shedding and automatic loading of the ESF busses. A few plants contain explicit requirements for load shedding and automatic ESF bus loading during shutdown.

2.3. Reason for the Proposed Change

The proposed change will eliminate the need to maintain the operability of the Loss of Power sensors and logic and the DG actuation circuits, as well as the load sequencer or plant-specific equivalent, during shutdown. Elimination of these unnecessary requirements will simplify configuration control of safety systems during shutdown conditions to facilitate required testing and maintenance activities as well as avoid the potential for delay of outage activities due to unplanned unavailability of functions not required for plant safety. In addition, elimination of automatic DG start requirements during shutdown will eliminate the potential for an inadvertent DG start.

No accident analyzed during Mode 5 or 6 is required to assume a loss of offsite or onsite power, nor an automatic start, tie-in to the ESF bus, and sequencer loading of a DG. The TS are required to be based on the accident analyses and none of the accidents assumed to occur during shutdown assume a loss of offsite power and the automatic start and loading of a DG onto the ESF busses. During shutdown, when reactor coolant system pressures and temperatures are low, there is sufficient time for an operator to manually start and load a DG on the ESF busses if needed. Therefore, the proposed change makes the TS consistent with the assumptions in the accident analysis.

2.4. Description of the Proposed Change

The Applicability statements of the DG Loss of Power or DG Loss of Voltage specifications (NUREG-1430 TS 3.3.8, NUREG-1431 TS 3.3.5, and NUREG-1432 TS 3.3.6 (analog) and TS 3.3.7 (digital)) are revised to eliminate the phrase, "When the associated DG is required to be operable by LCO 3.8.2, 'AC Sources - Shutdown'."

SR 3.8.2.1 is revised.

- The SR is changed to state the TS 3.8.1 SRs that are applicable instead of the TS 3.8.1 SRs that are not applicable.
- The following TS 3.8.1 SRs are no longer required to be met: SR 3.8.1.7, SR 3.8.1.11, SR 3.8.1.13, SR 3.8.1.15, and SR 3.8.1.18.
- The Note stating which SRs are not required to be performed is revised to reflect the changes to the SRs that are not required to be met.

The TS Bases are revised to state that automatic start of a DG is not assumed in Modes 5 and 6, and that operability of a DG in Modes 5 and 6 is based on the ability of the DG to be manually started, to accelerate to rated speed and voltage, to be manually connected to its respective ESF bus, and to accept required loads.

A model application is attached. The model may be used by licensees desiring to adopt the traveler following NRC approval.

3. TECHNICAL EVALUATION

3.1. Analysis Assumptions

Title 10 of the Code of Federal Regulations (10 CFR), paragraph 50.36, "Technical Specifications," states, "The technical specifications will be derived from the analyses and evaluation included in the safety analysis report." The NRC's Standard Review Plan (NUREG-0800) describes the following events to be analyzed for a Pressurized Water Reactor (PWR) during shutdown or during movement of [recently³] irradiated fuel assemblies:

- Section 15.4.6, "Inadvertent Decrease in Boron Concentration in the Reactor Coolant (PWR);"
- Section 15.7.3, "Postulated Radioactive Releases Due to Liquid-Containing Tank Failures;"
- Section 15.7.4, "Radiological Consequences of Fuel Handling Accidents;" and
- Section 15.7.5, "Spent Fuel Cask Drop Accidents."

None of these accident analyses assume a concurrent loss of offsite power and automatic start of the onsite DG on an engineered safety feature (ESF) actuation signal or Loss of Power signal. These sections do not discuss a loss of offsite power, and General Design Criterion 17, "Electric Power Systems," is not referenced. None of these accidents assume onsite power is available within a specified length of time after a loss of offsite power (e.g., 10 second DG start time) or the sequencing of accident loads onto the electrical busses. Any required active mitigation is assumed to be powered by the offsite power source with no need to consider a loss of offsite power and sequencing of the DG onto the ESF bus. However, the proposed change will not have an adverse effect on the capability to manually start and load a DG in accordance with plant procedures.

3.2. Changes to DG Loss of Power TS Applicability

The proposed change revises the DG Loss of Power TS Applicability to not require the LCO to be met in Modes 5 and 6. If the Loss of Power instrumentation and logic are not operable, the DG may be started and connected to the associated ESF bus manually. A DG may be started and

³ TSTF-51, "Revise Containment Requirements During Handling Irradiated Fuel and Core Alterations, " was approved by the NRC on November 1, 1999, and provides an option to limit some TS requirements to the movement of "recently" irradiated fuel instead of all irradiated fuel. The term "recently" is bracketed to indicate it is plant specific. Whether TSTF-51 has been adopted has no effect on the applicability of the proposed change.

connected to the ESF bus from the control room within minutes. This is sufficient to ensure there is no immediate difficulty.

3.3. Changes to SR 3.8.2.1 Required SRs

STS 3.8.1 contains twenty SRs to test the AC Sources. Each of the SRs is evaluated below to determine if it should be required to be met or performed in Modes 5 and 6 by SR 3.8.2.1.

SR	Requirement (Paraphrased)	Current STS SR 3.8.2.1 Requirement	Proposed Change
3.8.1.1	Verify correct breaker alignment and indicated power availability for each [required] offsite circuit.	Required to be met and performed.	No change.
3.8.1.2	Verify the required DG starts from standby conditions and achieves steady state voltage	Required to be met and performed.	No change.
3.8.1.3	Verify the required DG is synchronized and loaded and operates for ≥ 60 minutes	Required to be met but not required to be performed.	No change.
3.8.1.4	Verify each required day tank [and engine mounted tank] contains $\geq [220]$ gal of fuel oil.	Required to be met and performed.	No change.
3.8.1.5	Check for and remove accumulated water from each required day tank.	Required to be met and performed.	No change.
3.8.1.6	Verify the fuel oil transfer system operates to [automatically] transfer fuel oil from storage tank[s] to the required day tank.	Required to be met and performed.	No change.
3.8.1.7	Verify each DG starts from standby condition and achieves minimum voltage within the specified time limit and achieves steady state voltage.	Required to be met and performed.	Not required to be met or performed. There is no minimum DG start time assumed during shutdown.

SR	Requirement (Paraphrased)	Current STS SR 3.8.2.1 Requirement	Proposed Change
3.8.1.8	Verify [automatic [and] manual] transfer of AC power sources from the normal offsite circuit to each alternate [required] offsite circuit.	Not required to be met or performed because only one offsite circuit is required to be operable.	No change.
3.8.1.9	Verify each DG rejects a load greater than or equal to its associated single largest post-accident load and returns to normal frequency and voltage within a specified time period.	Required to be met but not required to be performed to prevent the required DG from being synchronized to the offsite circuit.	No change.
3.8.1.10	Verify each DG does not trip, and voltage is maintained within a specified limit during and following a load rejection.	Required to be met but not required to be performed to prevent the required DG from being synchronized to the offsite circuit.	No change.
3.8.1.11	Verify on an actual or simulated loss of offsite power signal de-energization of emergency buses, load shedding from emergency buses, and DG auto-start from standby condition.	Required to be met but not required to be performed to preclude deenergizing a required ESF bus.	Not required to be met or performed. There is no automatic DG start or bus load shedding assumed during shutdown. There is no minimum DG start time assumed during shutdown.
3.8.1.12	Verify on an actual or simulated ESF actuation signal each DG auto-starts from standby condition and reaches required voltage and frequency within a specified time.	Not required to be met or performed because the ESF actuation signal is not required to be operable.	No change.

SR	Requirement (Paraphrased)	Current STS SR 3.8.2.1 Requirement	Proposed Change
3.8.1.13	Verify each DG's noncritical automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal].	Required to be met but not required to be performed to prevent the operable DG from being rendered inoperable during performance of the SR	Not required to be met or performed. The DG is not assumed to start on a loss of voltage signal or ESF actuation signal during shutdown.
3.8.1.14	Verify each DG operates for ≥ 24 hours	Required to be met but not required to be performed to prevent the operable DG from being rendered inoperable during performance of the SR	No change.
3.8.1.15	Verify each DG starts and achieves a minimum voltage and frequency within a specified time and maintains steady state voltage.	Required to be met but not required to be performed to prevent the operable DG from being rendered inoperable during performance of the SR	Not required to be met or performed. There is no minimum DG start time assumed during shutdown.
3.8.1.16	Verify each DG synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power, transfers loads to offsite power source, and returns to ready-to-load operation.	Required to be met but not required to be performed to prevent the operable DG from being paralleled with the offsite power network during performance of the SR.	No change.

SR	Requirement (Paraphrased)	Current STS SR 3.8.2.1 Requirement	Proposed Change
3.8.1.17	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 returning DG to ready-to-load operation and automatically energizing the emergency load from offsite power.	Not required to be met or performed because the required operable DG(s) is not required to undergo periods of being synchronized to the offsite circuit.	No change.
3.8.1.18	Verify interval between each sequenced load block is within tolerance for each emergency [and shutdown] load sequencer.	Required to be met but not required to be performed to prevent the operable DG from being rendered inoperable during performance of the SR.	Not required to be met or performed. There is no automatic sequencing of loads assumed during shutdown.
3.8.1.19	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal de-energization of emergency buses, load shedding from emergency buses, DG auto-starts from standby condition within a specified time.	Not required to be met or performed because the ESF actuation signal is not required to be operable.	No change.
3.8.1.20	Verify, when started simultaneously from standby condition, each DG achieves rated voltage and frequency within a specified time period.	Not required to be met or performed because starting independence with the DG that is not required to be operable is not necessary.	No change.

Summarizing, the proposed change eliminates the requirement to meet SR 3.8.1.7 and 3.8.1.15 because there is no assumed minimum time to start and load a DG during shutdown. The proposed change eliminates the requirement to meet SR 3.8.1.11 and SR 3.8.1.13 in Modes 5 and 6 because there is no assumption that an ESF bus will shed load and that a DG will start on a Loss of Power signal or ESF actuation signal during shutdown. The proposed change eliminates the requirement to meet SR 3.8.1.18 because there is no assumption that loads will be

automatically sequenced onto the ESF bus during shutdown. If a plant's current "AC Sources - Shutdown" TS requires meeting "AC Sources - Operating" SRs that verify these functions, the proposed change supports eliminating the requirement to meet those SRs during shutdown.

The proposed Note to SR 3.8.2.1 states: "The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.14, and SR 3.8.1.16." These SRs are not required to be performed because only one DG is required to be operable, and performance of the SRs could render the required DG inoperable. Consistent with the discussion of "met" and "performed" in STS Section 1.4, the capability to meet the acceptance criteria in these SRs must be present, but it is not required to perform the SRs. These SRs are typically performed during a refueling outage by testing the DG that is not required to be operable such that the SRs have been performed prior to entering the Applicability of TS 3.8.1 when the SRs must be both met and performed on both DGs.

3.4. Plant-Specific Differences

The following section summarizes ways in which a plant's TS may vary from the affected STS requirements.

Some plant's licensing basis may include plant-specific accident analyses that differ from the analyses described in NUREG-0800. The model application requires licensees adopting the proposed traveler to verify the traveler justification is applicable to the plant or to justify any variations.

Unlike the STS, some plant's Loss of Power requirements are not applicable when the associated DG is required to be operable by LCO 3.8.2 or while shutdown. For those plants, the change to the Applicability of the Loss of Power specification is not necessary when adopting the proposed change.

Plants that have TS not based on the STS have Loss of Power requirements in the Engineered Safety Feature Actuation System (ESFAS) Instrumentation TS. In some plant's TS the Applicability for each DG Loss of Power function is listed in a function table. The proposed change is applicable, and the variations are required to be described by the model application.

Some plant-specific TS have LCOs, LCO Notes, Actions, or SR Notes related to the DG Loss of Power Start requirements during shutdown or the "AC Sources - Shutdown" requirements which will no longer be needed after implementation of the proposed change. The model application requires such plant-specific changes to be described and are included within the scope of the proposed change.

The plant-specific TS 3.8.1 may not include all of the SRs in the STS or may contain SRs that do not appear in the STS in order to reflect the plant's design and licensing basis. It is not necessary for licensees to justify the current existence or lack of SRs not related to the proposed change. In plant-specific adoption of the proposed change, licensees will determine whether their existing plant-specific SR 3.8.2.1 (or equivalent) requirements should be met or performed in Modes 5 and 6. This determination is described in the model application.

The plant-specific equivalents of SR 3.8.2.1 may have several editorial variations, the most common being the listing of the TS 3.8.1 SRs that are applicable instead of listing the TS 3.8.1 SRs that are not applicable. This does not affect the applicability of the proposed change.

The STS 3.8.2 specification is applicable in Modes 5 and 6 and during movement of irradiated or recently irradiated fuel assemblies. Some non-STs plant TS and some STS-based plant TS are not applicable during movement of irradiated or recently irradiated fuel assemblies. This difference does not affect the applicability of the proposed change.

Some plants have load sequencing equipment, such as timers and breakers, that serve the same purpose as the load sequencer described in STS 3.8.1.18 and have SRs that verify the plant-specific design requirements are met. Those SRs may be eliminated from SR 3.8.2.1 because there is no assumption of automatic load sequencing during shutdown. The model application requires those plant-specific variations to be described.

At some multi-unit sites, the AC sources for a shutdown unit may be credited to perform safety functions for an operating unit and those requirements may be reflected in TS 3.8.1, TS 3.8.2, or the plant-specific equivalent. In that case, the proposed change may not be applicable or may be only partially applicable. The model application requires those plant-specific variations to be described.

3.5. Precedent

TSTF-542, "Reactor Pressure Vessel Water Inventory Control," (Reference 1), approved by the NRC on December 20, 2016, and TSTF-582, "RPV WIC Enhancements," (Reference 2), approved by the NRC on August 13, 2020, made similar changes to the Loss of Power signal TS and SR 3.8.2.1 for boiling water reactor (BWR) plant designs. The justification for those travelers is similar to the justification for the proposed change in that there are no accidents analyzed in Mode 4 or 5 (the BWR equivalent to PWR Modes 5 and 6) that assume a loss of offsite or onsite power, nor an automatic start, tie-in to the ESF bus, and sequencer loading of a DG. The NRC's approval of these travelers concluded that manual start of a DG, if needed, is sufficient to ensure there is no immediate difficulty.

4. REGULATORY EVALUATION

The regulation at Title 10 of the Code of Federal Regulations (10 CFR) Section 50.36(b) requires:

Each license authorizing operation of a ... utilization facility ... will include technical specifications. The technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to [10 CFR] 50.34 ["Contents of applications; technical information"]. The Commission may include such additional technical specifications as the Commission finds appropriate.

Per 10 CFR 50.90, whenever a holder of a license desires to amend the license, application for an amendment must be filed with the Commission, fully describing the changes desired, and following as far as applicable, the form prescribed for original applications.

Per 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses to the extent applicable and appropriate.

Section IV, "The Commission Policy," of the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58FR39132), dated July 22, 1993, states in part that improved STS have been developed and will be maintained for each NSSS owners group. The Commission Policy encourages licensees to use the improved STS as the basis for plant-specific Technical Specifications." The industry's proposal of travelers and the NRC's approval of travelers is the method used to maintain the improved STS as described in the Commission's Policy. Following NRC approval, licensees adopt travelers into their plant-specific technical specifications following the requirements of 10 CFR 50.90. Therefore, the traveler process facilitates the Commission's policy while satisfying the requirements of the applicable regulations.

The regulation at 10 CFR 50.36(a)(1) also requires the application to include a "summary statement of the bases or reasons for such specifications, other than those covering administrative controls. The proposed traveler includes Bases changes appropriate for the proposed TS changes, and is consistent with the intent of 10 CFR 50.36(a)(1).

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 approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

5. REFERENCES

1. Final Safety Evaluation of Technical Specifications Task Force Traveler TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control," December 20, 2016, ADAMS ML16343B066.
2. Final Safety Evaluation of Technical Specifications Task Force Traveler TSTF-582, Revision 0, "RPV WIC Enhancements" Using the Consolidated Line Item Improvement Process," August 13, 2020, ADAMS ML20223A000.

Model Application

[DATE]

10 CFR 50.90

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

DOCKET NO.PLANT NAME

[50]-[xxx]

SUBJECT: Application to Revise Technical Specifications to Adopt
TSTF-589, "Eliminate Automatic Diesel Generator Start During
Shutdown"

Pursuant to 10 CFR 50.90, [LICENSEE] is submitting a request for an amendment to the Technical Specifications (TS) for [PLANT NAME, UNIT NOS.].

[LICENSEE] requests adoption of TSTF-589, "Eliminate Automatic Diesel Generator Start During Shutdown," which is an approved change to the Standard Technical Specifications (STS), into the [PLANT NAME, UNIT NOS] TS. TSTF-589 eliminates the TS requirements for automatic diesel generator (DG) start and loading during shutdown.

The enclosure provides a description and assessment of the proposed changes. Attachment 1 provides the existing TS pages marked to show the proposed changes. Attachment 2 provides revised (clean) TS pages. Attachment 3 provides the existing TS Bases pages marked to show revised text associated with the proposed TS changes and is provided for information only.

[LICENSEE] requests that the amendment be reviewed under the Consolidated Line Item Improvement Process (CLIIP). Approval of the proposed amendment is requested within 6 months of completion of the NRC's acceptance review. Once approved, the amendment shall be implemented within [90] days.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated [STATE] Official.

[In accordance with 10 CFR 50.30(b), a license amendment request must be executed in a signed original under oath or affirmation. This can be accomplished by attaching a notarized affidavit confirming the signature authority of the signatory, or by including the following statement in the cover letter: "I declare under penalty of perjury that the foregoing is true and correct. Executed on (date)." The alternative statement is pursuant to 28 USC 1746. It does not require notarization.]

If you should have any questions regarding this submittal, please contact [NAME, TELEPHONE NUMBER].

Sincerely,

[Name, Title]

Enclosure: Description and Assessment

Attachments: 1. Proposed Technical Specification Changes (Mark-Up)
2. Revised Technical Specification Pages
3. Proposed Technical Specification Bases Changes (Mark-Up) – For Information Only

[The attachments are to be provided by the licensee and are not included in the model application.]

cc: NRC Project Manager
NRC Regional Office
NRC Resident Inspector
State Contact

ENCLOSURE

DESCRIPTION AND ASSESSMENT

1.0 DESCRIPTION

[LICENSEE] requests adoption of TSTF-589, "Eliminate Automatic Diesel Generator Start During Shutdown," which is an approved change to the Standard Technical Specifications (STS), into the [PLANT NAME, UNIT NOS] TS. TSTF-589 eliminates the TS requirements for automatic diesel generator (DG) start and loading during shutdown.

2.0 ASSESSMENT

2.1 Applicability of Safety Evaluation

[LICENSEE] has reviewed the safety evaluation for TSTF-589 provided to the Technical Specifications Task Force in a letter dated [DATE]. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-589. [LICENSEE] has concluded that the justifications presented in TSTF-589 and the safety evaluation prepared by the NRC staff are applicable to [PLANT, UNIT NOS.] and justify this amendment for the incorporation of the changes to the [PLANT] TS.

[REVIEWER'S NOTE: Differences between the plant design and TS and the assumed plant design and STS that do not affect the revisions made to the TS or Bases are described here. Differences which alter the TS or Bases changes are described in the "Variations" section, below.]

[Describe any plant-specific analyses that assume a loss of offsite power during shutdown and/or automatic DG start and sequencing of loads onto the ESF busses, and why the change is still applicable.]

[The existing TS requirements on detection of [loss of voltage] [loss of power] to the Engineered Safety Feature (ESF) busses are in TS [3.3.2, "ESFAS Instrumentation."] The requirements are revised as described in the traveler.

[The existing TS [3.8.2, "AC Sources - Shutdown"] requirements are applicable in Modes 5 and 6 but, unlike the STS, are not applicable during movement of irradiated fuel. This does not affect the applicability of the traveler to the [PLANT] TS.]

[The existing SR [3.8.2.1] differs from the STS SR 3.8.2.1. The existing SR 3.8.2.1 lists the TS 3.8.1 SRs that are applicable instead of the 3.8.1 SRs that are not applicable. This difference does not affect the applicability of the traveler to the [PLANT] TS.

[The [PLANT] TS for [TS 3.8.2, "AC Sources - Shutdown,"] includes requirements to support an operating unit's shared equipment. [Describe the requirements and why the proposed change is justified.]]

2.2 Variations

[LICENSEE is not proposing any variations from the TS changes described in TSTF-589 or the applicable parts of the NRC staff's safety evaluation.] [LICENSEE is proposing the following variations from the TS changes described in TSTF-589 or the applicable parts of the NRC staff's safety evaluation:]

[The [PLANT] TS utilize different [numbering][and][titles] than the STS on which TSTF-589 was based. Specifically, [describe differences between the plant-specific TS numbering and/or titles and the TSTF-589 numbering and titles.] These differences are administrative and do not affect the applicability of TSTF-589 to the [PLANT] TS.]

[The existing TS [3.3.5, "DG Loss of Voltage,"] specification is not applicable [when LCO 3.8.2, "AC Sources - Shutdown," is applicable] [during shutdown]. Therefore, the change to the TS [3.3.5] Applicability is not included in the proposed change.]

[The existing TS [3.3.5] is different from the STS [3.3.5]. [Describe plant-specific presentation, LCO, LCO Notes, Actions, or SR Notes applicable during shutdown that are different from the STS.] Revision or removal of these requirements is made to be consistent with the changes approved in the traveler.]

[The existing SR [3.8.2.1] differs from the STS SR 3.8.2.1. [The existing SR 3.8.2.1 lists different TS 3.8.1 SRs that must be met or performed than the STS.] [Described the differences.] These differences do not affect the applicability of the traveler.]

[The existing TS [3.8.2] is different from the STS 3.8.2. [Describe plant-specific LCO, LCO Notes, Actions, or SR Notes applicable during shutdown that are different from the STS.] Revision or removal of these requirements is made to be consistent with the changes approved in the traveler.]

[The [PLANT] design and TS utilizes [timers, breakers, etc.] instead of sequencers as described in the STS. [Describe the existing TS requirements and SRs and why the proposed change is applicable to the plant design.] Elimination of those requirements during shutdown is consistent with the approved traveler.]

[The [PLANT] TS contain requirements that differ from the STS on which TSTF-589 was based but are encompassed in the TSTF-589 justification. [Describe differences and why TSTF-589 is still applicable.]

[The [PLANT] TS for [TS 3.8.2, "AC Sources - Shutdown,"] includes requirements to support an operating unit's shared equipment. These requirements are revised. [Describe the revisions and why the proposed changes are justified.]]

[The [PLANT] SR [3.8.2.1] references different TS 3.8.1 SRs than does STS SR 3.8.2.1. The following SRs will no longer be required to be met by SR 3.8.2.1:

Plant Specific SR Number and Description	STS-Equivalent SR Number and Description	Why the Plant-Specific SR May Be Eliminated
[Number and Description]	3.8.1.7, Verify each DG starts from standby condition and achieves minimum voltage within the specified time limit and achieves steady state voltage.	There is no assumed minimum time to start and load a DG, no assumption that an ESF bus will shed load and that a DG will start on a loss of power or ESF actuation signal, or no requirement for loads to be automatically sequenced onto the ESF bus during shutdown.
[Number and Description]	3.8.1.11, Verify on an actual or simulated loss of offsite power signal de-energization of emergency buses, load shedding from emergency buses, and DG auto-start from standby condition.	There is no automatic DG start or bus load shedding assumed during shutdown. There is no minimum DG start time assumed during shutdown.
[Number and Description]	3.8.1.13, Verify each DG's noncritical automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal].	The DG is not assumed to start on a loss of voltage signal or ESF actuation signal during shutdown.
[Number and Description]	3.8.1.15, Verify each DG starts and achieves a minimum voltage and frequency within a specified time and maintains steady state voltage.	There is no minimum DG start time assumed during shutdown.
[Number and Description]	3.8.1.18, Verify interval between each sequenced load block is within tolerance for each emergency [and shutdown] load sequencer.	There is no automatic sequencing of loads assumed during shutdown.

]

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Analysis

[LICENSEE] requests adoption of TSTF-589, "Eliminate Automatic Diesel Generator Start During Shutdown," which is an approved change to the Standard Technical Specifications (STS), into the [PLANT NAME, UNIT NOS] Technical Specifications (TS). TSTF-589 eliminates the TS requirements for automatic diesel generator (DG) start and loading during shutdown.

[LICENSEE] has evaluated if a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No

The proposed change eliminates the TS requirements for automatic DG start and loading during shutdown.

The proposed change does not alter any design function assumed in the accident analyses or the capability of any structure, system, or component (SSC) of the plant to perform a design function assumed in the accident analyses. The analyses of accidents initiated during shutdown do not assume a loss of offsite power or the automatic start and loading of a DG during shutdown. Automatic DG start and loading is not an initiator of any accident previously evaluated. Therefore, the proposed change does not affect the probability of an accident previously evaluated. Automatic detection of a loss of power, automatic load shedding of the Engineered Safety Feature (ESF) busses, and automatic start and loading of a DG onto the ESF busses is not assumed to mitigate the consequences of any previously evaluated accident initiated during shutdown. As a result, there is no impact on the consequences of any accident previously evaluated.

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

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

Response: No

The proposed change eliminates the TS requirements for automatic DG start and loading during shutdown.

The proposed change does not affect the ability of any SSC to perform the design functions assumed in the accident analyses. The proposed change does not create any credible new failure mechanisms, malfunctions, or accident initiators not considered in

the design and licensing bases that would have been considered a design basis accident in the Updated Final Safety Analysis Report (UFSAR) had it been previously identified.

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

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

Response: No

The proposed change eliminates the TS requirements for automatic DG start and loading during shutdown.

The proposed change does not alter a design basis or safety limit (i.e., the controlling numerical value for a parameter established in the UFSAR or the license) and does not affect any conservatism in the evaluation and analysis methods that are used to demonstrate compliance with regulatory and licensing requirements. As a result, the margin of safety is not significantly reduced.

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

Based on the above, [LICENSEE] concludes that the proposed change presents 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.

3.2 Conclusion

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.

4.0 ENVIRONMENTAL CONSIDERATION

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

Technical Specifications and Bases Changes

3.3 INSTRUMENTATION

3.3.8 Emergency Diesel Generator (EDG) Loss of Power Start (LOPS)

LCO 3.3.8 Three channels of loss of voltage Function and three channels of degraded voltage Function EDG LOPS instrumentation per EDG shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4;
~~When associated EDG is required to be OPERABLE by LCO 3.8.2 "AG Sources Shutdown."~~

ACTIONS

-----NOTE-----
 Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per EDG inoperable.	A.1 Place channel in trip.	1 hour <u>OR</u> In accordance with the Risk Informed Completion Time Program]
B. One or more Functions with two or more channels per EDG inoperable.	B.1 Restore all but one channel to OPERABLE status.	1 hour <u>OR</u> In accordance with the Risk Informed Completion Time Program]
C. Required Action and associated Completion Time not met.	C.1 Enter applicable Condition(s) and Required Action for EDG made inoperable by EDG LOPS.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.2.1</p> <p>-----NOTE----- The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.9, through SR 3.8.1.10, SR 3.8.1.14, and through SR 3.8.1.16, and [SR 3.8.1.18].</p> <p>-----</p> <p>The following SRs are applicable for For AC sources required to be OPERABLE:</p> <p>SR 3.8.1.1 SR 3.8.1.6 SR 3.8.1.2 SR 3.8.1.9 SR 3.8.1.3 SR 3.8.1.10 SR 3.8.1.4 SR 3.8.1.14 SR 3.8.1.5 SR 3.8.1.16</p> <p>, the SRs of Specification 3.8.1, "AC Sources - Operating," except SR 3.8.1.8, SR 3.8.1.12, SR 3.8.1.17, SR 3.8.1.19, and SR 3.8.1.20, are applicable.</p>	<p>In accordance with applicable SRs</p>

BASES

BACKGROUND (continued)

With three protection channels in a two-out-of-three trip logic for each division of the 4.16 kV power supply, no single failure will cause or prevent protective system actuation. This arrangement meets IEEE-279-1971 criteria (Ref. 3).

APPLICABLE
SAFETY
ANALYSES

The EDG LOPS is required for the Engineered Safety Features (ESF) to function in any accident with a loss of offsite power. Its design basis is that of the ESFAS.

Accident analyses credit the loading of the EDG, based on the loss of offsite power, during a loss of coolant accident (LOCA). The actual EDG Start has historically been associated with the ESFAS actuation. The diesel loading has been included in the delay time associated with each safety system component requiring EDG supplied power following a loss of offsite power. The analysis assumes a nonmechanistic EDG loading, which does not explicitly account for each individual component of the loss of power detection and subsequent actions. The total actuation time for the limiting systems, high pressure injection, and low pressure injection is 35 seconds. This delay time includes contributions from the EDG Start, EDG loading, and safety injection system component actuation. The response of the EDG to a loss of power must be demonstrated to fall within this analysis response time when including the contributions of all portions of the delay.

The required channels of LOPS, in conjunction with the ESF systems powered from the EDGs, provide unit protection in the event of any of the analyzed accidents discussed in the accident analysis (Ref. 2), in which a loss of offsite power is assumed.

The delay times assumed in the safety analysis for the ESF equipment include the 10 second EDG Start delay and, if applicable, the appropriate sequencing delay. The response times for ESFAS actuated equipment in LCO 3.3.5, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," include the appropriate EDG loading and sequencing delay.

The EDG LOPS channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO for the LOPS requires that three channels per bus of each LOPS instrumentation Function shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOPS supports safety systems associated with the ESFAS. ~~In MODES 5 and 6, the three channels must be OPERABLE whenever the associated EDG is required to be OPERABLE to ensure that the automatic start of the EDG is available when needed.~~

BASES

LCO (continued)

Loss of Voltage LOPS

Voltage and Response Time: The Allowable Value for the loss of voltage channels is ≥ 0 V. This Allowable Value and the associated channel response time are based on the physical characteristics of the loss of voltage sensing relays. The loss of voltage channels respond to a complete loss of ES bus voltage, providing automatic starting and loading of the associated EDG. However, their response time is not critical to the overall ES equipment response time following an actuation, since the degraded voltage LOPS instrumentation will also respond to the complete loss of voltage, and will do so earlier than the loss of voltage instrumentation. The loss of voltage channel response includes only the time response associated with the undervoltage relays, including the nominal setpoint of [7.8 seconds] and a tolerance of [7%] or [0.55 seconds].

APPLICABILITY The EDG LOPS actuation Function shall be OPERABLE in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. **In MODES 5 and 6, automatic start of an EDG is not assumed in the applicable safety analyses.** ~~Actuation is also required whenever the EDG is required to be OPERABLE by LCO 3.8.2, "AG Sources – Shutdown," so that the EDG can perform its function on a loss of power or degraded power to the vital bus.~~

ACTIONS If a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then the function that the channel provides must be declared inoperable and the LCO Condition entered for the particular protection function affected. Since the required channels are specified on a per EDG basis, the Condition may be entered separately for each EDG.

A Note has been added to the ACTIONS indicating that separate Condition entry is allowed for each Function.

A.1

If one channel per EDG in one or more Functions is inoperable, it must be tripped within 1 hour [or in accordance with the Risk Informed Completion Time Program]. With a channel in trip, the LOPS channels are configured to provide a one-out-of-two logic to initiate a trip of the incoming offsite power. In trip, one additional valid actuation will cause a LOPS signal on the bus. The 1 hour Completion Time is reasonable to evaluate and to take action by correcting a degraded condition in an orderly manner and takes into account the low probability of an event requiring LOPS occurring during this interval.

BASES

ACTIONS (continued)

B.1

Condition B applies when two or more undervoltage or two or more degraded voltage channels on a single bus are inoperable.

Required Action B.1 requires all but one inoperable channel to be restored to OPERABLE status within 1 hour [or in accordance with the Risk Informed Completion Time Program]. With two or more channels inoperable, the logic is not capable of providing an automatic EDG LOPS signal for valid loss of voltage or degraded voltage conditions. The 1 hour Completion Time is reasonable to evaluate and to take action by correcting the degraded condition in an orderly manner and takes into account the low probability of an event requiring LOPS occurring during this interval.

C.1

Condition C applies if the Required Action of Condition A or Condition B and the associated Completion Time is not met.

Required Action C.1 ensures that Required Actions for affected diesel generator inoperabilities are initiated. ~~Depending on unit MODE, the~~ Actions specified in LCO 3.8.1, "AC Sources - Operating;" ~~or LCO 3.8.2,~~ are required immediately.

SURVEILLANCE
REQUIREMENTSSR 3.3.8.1

SR 3.3.8.1 is the performance of the CHANNEL CHECK to ensure that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

BASES

APPLICABLE SAFETY ANALYSES (continued)

required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown MODES based on:

- a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration,
- b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both,
- c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems, and
- d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

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

LCO

One offsite circuit capable of supplying the onsite Class 1E power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems - Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with a distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required offsite circuit and **the ability to manually start a** DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents [involving handling recently irradiated fuel]).

The qualified offsite circuit must be capable of providing three phases of AC power, maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the unit.

BASES

LCO (continued)

[Offsite circuit #1 consists of Safeguards Transformer B, which is supplied from Switchyard Bus B, and is fed through breaker 52-3 powering the ESF transformer XNB01, which, in turn, powers the #1 ESF bus through its normal feeder breaker. The second offsite circuit consists of the Startup Transformer, which is normally fed from the Switchyard Bus A, and is fed through breaker PA O201 powering the ESF transformer, which, in turn, powers the #2 ESF bus through its normal feeder breaker.]

The DG must be capable of **being manually started**~~starting~~, accelerating to rated speed and voltage, ~~and~~ connecting to its respective ESF bus ~~on detection of bus undervoltage and~~ . ~~This sequence must be accomplished within [10] seconds. The DG must be capable of accepting required loads within the assumed loading sequence intervals, and must continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.~~

~~Proper sequencing of loads, including tripping of non-essential loads, is a required function for DG OPERABILITY.~~

~~[In addition, proper sequencer operation is an integral part of offsite circuit OPERABILITY since its inoperability impacts on the ability to start and maintain energized loads required OPERABLE by LCO 3.8.10.]~~

It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of [recently] irradiated fuel assemblies provide assurance that:

- a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies,
- b. Systems needed to mitigate a fuel handling accident [involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)] are available,
- c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and
- d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

BASES

ACTIONS (continued)

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS are not entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 provides the appropriate restrictions for the situation involving a de-energized train.

SURVEILLANCE
REQUIREMENTSSR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.8 is not required to be met since only one offsite circuit is required to be OPERABLE. **SR 3.8.1.7, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.13, SR 3.8.1.15, [SR 3.8.1.18], and SR 3.8.1.19 are not required to be met because DG start and load within a specified time and response on an offsite power or ECCS initiation signal is not assumed in the accident analysis.** ~~SR 3.8.1.12 and SR 3.8.1.19 are not required to be met because the ESF actuation signal is not required to be OPERABLE.~~ SR 3.8.1.6 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.9 is excepted because starting independence is not required with the DG(s) that is not required to be OPERABLE.

This SR is modified by a Note **which precludes** ~~The reason for the Note is to preclude~~ requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of SRs, and to preclude deenergizing a required 4160 V ESF bus or disconnecting a required offsite circuit during performance of

BASES

SURVEILLANCE REQUIREMENTS (continued)

SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that **the DG and offsite circuit** ~~these SRs~~ must still be capable of ~~being satisfying the acceptance criteria in these SRs~~^{met}, but actual performance is not required during periods when the DG and offsite circuit is required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

REFERENCES None.

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 [Three] channels per bus of the loss of voltage Function and [three] channels per bus of the degraded voltage Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4;
~~When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources—Shutdown."~~

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per bus inoperable.	A.1 -----NOTE----- The inoperable channel may be bypassed for up to [4] hours for surveillance testing of other channels. ----- Place channel in trip.	[6] hours <u>[OR]</u> In accordance with the Risk Informed Completion Time Program]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.2.1</p> <p>-----NOTE----- The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.9, through SR 3.8.1.104, SR 3.8.1.143 and through SR 3.8.1.16, and [SR 3.8.1.18].</p> <p>-----</p> <p>The following SRs are applicable for For AC sources required to be OPERABLE:</p> <p>SR 3.8.1.1 SR 3.8.1.6 SR 3.8.1.2 SR 3.8.1.9 SR 3.8.1.3 SR 3.8.1.10 SR 3.8.1.4 SR 3.8.1.14 SR 3.8.1.5 SR 3.8.1.16</p> <p>, the SRs of Specification 3.8.1, "AC Sources - Operating," except SR 3.8.1.8, SR 3.8.1.12, SR 3.8.1.17, SR 3.8.1.19, and SR 3.8.1.20, are applicable.</p>	<p>In accordance with applicable SRs</p>

BASES

APPLICABLE SAFETY ANALYSES (continued)

The LOP DG start instrumentation channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO for LOP DG start instrumentation requires that [three] channels per bus of both the loss of voltage and degraded voltage Functions shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. ~~In MODES 5 and 6, the [three] channels must be OPERABLE whenever the associated DG is required to be OPERABLE to ensure that the automatic start of the DG is available when needed.~~ A channel is OPERABLE with a trip setpoint value outside its calibration tolerance band provided the trip setpoint "as-found" value does not exceed its associated Allowable Value and provided the trip setpoint "as-left" value is adjusted to a value within the "as-left" calibration tolerance band of the Nominal Trip Setpoint. A trip setpoint may be set more conservative than the Nominal Trip Setpoint as necessary in response to plant conditions. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

APPLICABILITY

The LOP DG Start Instrumentation Functions are required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. ~~Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE so that it can perform its function on a LOP or degraded power to the vital bus. In MODES 5 and 6, automatic start of an EDG is not assumed in the applicable safety analyses.~~

ACTIONS

-----REVIEWER'S NOTE-----
In TS 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation," the loss of power function was not included in the generic evaluations approved in either WCAP-10271, as supplemented, or WCAP-14333. In order to apply relaxations similar to those in WCAP-10271, as supplemented, or WCAP-14333, licensees must submit plant specific evaluations for NRC review and approval.

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then the function that channel provides must be declared inoperable and the LCO Condition entered for the particular protection function affected.

BASES

ACTIONS (continued)

C.1

Condition C applies to each of the LOP DG start Functions when the Required Action and associated Completion Time for Condition A or B are not met.

In these circumstances the Conditions specified in LCO 3.8.1, "AC Sources - Operating," ~~or LCO 3.8.2, "AC Sources - Shutdown,"~~ for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure unit safety.

SURVEILLANCE
REQUIREMENTSSR 3.3.5.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

[The Frequency of 12 hours is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

APPLICABLE SAFETY ANALYSES (continued)

significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

- a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.
- b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.
- c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.
- d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

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

LCO

One offsite circuit capable of supplying the onsite Class 1E power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems - Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with a distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required offsite circuit and **the ability to manually start a** DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents [involving handling recently irradiated fuel]).

The qualified offsite circuit must be capable of providing three phases of AC power, maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the unit.

BASES

LCO (continued)

[Offsite circuit #1 consists of Safeguards Transformer B, which is supplied from Switchyard Bus B, and is fed through breaker 52-3 powering the ESF transformer XNB01, which, in turn, powers the #1 ESF bus through its normal feeder breaker. The second offsite circuit consists of the Startup Transformer, which is normally fed from the Switchyard Bus A, and is fed through breaker PA 0201 powering the ESF transformer, which, in turn, powers the #2 ESF bus through its normal feeder breaker.]

The DG must be capable of **being manually started, starting,** accelerating to rated speed and voltage, **and** connecting to its respective ESF bus, **and** ~~on detection of bus undervoltage. This sequence must be accomplished within [10] seconds. The DG must be capable of~~ accepting required loads. ~~within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.~~

~~Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.~~

~~[In addition, proper sequencer operation is an integral part of offsite circuit OPERABILITY since its inoperability impacts on the ability to start and maintain energized loads required OPERABLE by LCO 3.8.10.]~~

It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of [recently] irradiated fuel assemblies provide assurance that:

- a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core,
- b. Systems needed to mitigate a fuel handling accident [involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)] are available,
- c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and

BASES

ACTIONS (continued)

concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS would not be entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 would provide the appropriate restrictions for the situation involving a de-energized train.

SURVEILLANCE
REQUIREMENTSSR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.8 is not required to be met since only one offsite circuit is required to be OPERABLE. **SR 3.8.1.7, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.13, SR 3.8.1.15, [SR 3.8.1.18], and SR 3.8.1.19 are not required to be met because DG start and load within a specified time and response on an offsite power or ECCS initiation signal is not assumed in the accident analysis. SR 3.8.1.12 and SR 3.8.1.19 are not required to be met because the ESF actuation signal is not required to be OPERABLE.** SR 3.8.1.17 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with the DG(s) that is not required to be operable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note **which precludes** ~~—The reason for the Note is to preclude~~ requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of SRs, and to preclude deenergizing a required 4160 V ESF bus or disconnecting a required offsite circuit during performance of SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that **the DG and offsite circuit these SRs** must still be capable of **satisfying the acceptance criteria in these SRs**~~being met~~, but actual performance is not required during periods when the DG and offsite circuit is required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

REFERENCES None.

3.3 INSTRUMENTATION (Analog)

3.3.6 Diesel Generator (DG) - Loss of Voltage Start (LOVS) (Analog)

LCO 3.3.6 [Four] channels of Loss of Voltage Function and [four] channels of Degraded Voltage Function auto-initiation instrumentation per DG shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4;
~~When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources Shutdown."~~

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per DG inoperable.	A.1 Place channel in bypass or trip. <u>AND</u> A.2.1 Restore channel to OPERABLE status. <u>OR</u>	1 hour [48] hours <u>OR</u> In accordance with the Risk Informed Completion Time Program]

3.3 INSTRUMENTATION (Digital)

3.3.7 Diesel Generator (DG) - Loss of Voltage Start (LOVS) (Digital)

LCO 3.3.7 [Four] channels of Loss of Voltage Function and [four] channels of Degraded Voltage Function auto-initiation instrumentation per DG shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4;
~~When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources Shutdown."~~

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per DG inoperable.	A.1 Place channel in bypass or trip <u>AND</u> A.2 Restore channel to OPERABLE status.	1 hour Prior to entering MODE 2 following next MODE 5 entry
B. One or more Functions with two channels per DG inoperable.	B.1 Enter applicable Conditions and Required Actions for the associated DG made inoperable by DG - LOVS instrumentation. <u>OR</u>	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY										
<p>SR 3.8.2.1</p> <p>-----NOTE----- The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.9, through SR 3.8.1.104, SR 3.8.1.143, and through SR 3.8.1.16, and [SR 3.8.1.18].</p> <p>-----</p> <p>The following SRs are applicable for For AC sources required to be OPERABLE:</p> <table border="0"> <tr> <td>SR 3.8.1.1</td> <td>SR 3.8.1.6</td> </tr> <tr> <td>SR 3.8.1.2</td> <td>SR 3.8.1.9</td> </tr> <tr> <td>SR 3.8.1.3</td> <td>SR 3.8.1.10</td> </tr> <tr> <td>SR 3.8.1.4</td> <td>SR 3.8.1.14</td> </tr> <tr> <td>SR 3.8.1.5</td> <td>SR 3.8.1.16</td> </tr> </table> <p>, the SRs of Specification 3.8.1, "AC Sources - Operating," except SR 3.8.1.8, SR 3.8.1.12, SR 3.8.1.17, SR 3.8.1.19, and SR 3.8.1.20, are applicable.</p>	SR 3.8.1.1	SR 3.8.1.6	SR 3.8.1.2	SR 3.8.1.9	SR 3.8.1.3	SR 3.8.1.10	SR 3.8.1.4	SR 3.8.1.14	SR 3.8.1.5	SR 3.8.1.16	<p>In accordance with applicable SRs</p>
SR 3.8.1.1	SR 3.8.1.6										
SR 3.8.1.2	SR 3.8.1.9										
SR 3.8.1.3	SR 3.8.1.10										
SR 3.8.1.4	SR 3.8.1.14										
SR 3.8.1.5	SR 3.8.1.16										

BASES

BACKGROUND (continued)

accept loads within a 10 second time interval on the Engineered Safety Features Actuation System (ESFAS) or LOVS. Emergency power is established within the maximum time delay assumed for each event analyzed in the accident analysis (Ref. 2).

Since there are four protective channels in a two-out-of-four trip logic for each division of the 4.16 kV power supply, no single failure will cause or prevent protective system actuation. This arrangement meets IEEE Standard 279-1971 criteria (Ref. 4).

APPLICABLE
SAFETY
ANALYSES

The DG - LOVS is required for Engineered Safety Features (ESF) systems to function in any accident with a loss of offsite power. Its design basis is that of the ESFAS.

Accident analyses credit the loading of the DG based on a loss of offsite power during a loss of coolant accident. The actual DG start has historically been associated with the ESFAS actuation. The diesel loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analysis assumes a nonmechanistic DG loading, which does not explicitly account for each individual component of the loss of power detection and subsequent actions. This delay time includes contributions from the DG start, DG loading, and Safety Injection System component actuation. The response of the DG to a loss of power must be demonstrated to fall within this analysis response time when including the contributions of all portions of the delay.

The required channels of LOVS, in conjunction with the ESF systems powered from the DGs, provide plant protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed. LOVS channels are required to meet the redundancy and testability requirements of GDC 21 in 10 CFR 50, Appendix A (Ref. 5).

The delay times assumed in the safety analysis for the ESF equipment include the [10] second DG start delay and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment include the appropriate DG loading and sequencing delay.

The DG - LOVS channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO for the LOVS requires that four channels per bus of each LOVS instrumentation Function be OPERABLE in MODES 1, 2, 3, and 4. ~~and when the associated DG is required to be OPERABLE by LCO 3.8.2, "AG Sources - Shutdown."~~ The LOVS supports safety systems associated

BASES

LCO (continued)

with the ESFAS. ~~In MODES 5 and 6, the four channels must be OPERABLE whenever the associated DG is required to be OPERABLE to ensure that the automatic start of the DG is available when needed.~~

Actions allow maintenance (trip channel) bypass of individual channels. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). At plants where adequate channel to channel independence has been demonstrated, specific exceptions have been approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.

Loss of LOVS Function could result in the delay of safety system initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power, which is an anticipated operational occurrence, the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only the one turbine driven pump as well as an increased potential for a loss of decay heat removal through the secondary system.

Only Allowable Values are specified for each Function in the LCO. Nominal trip setpoints are specified in the plant specific setpoint calculations. The nominal setpoints are selected to ensure that the setpoint measured by CHANNEL FUNCTIONAL TESTS does not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within the Allowable Value, is acceptable, provided that operation and testing are consistent with the assumptions of the plant specific setpoint calculation. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

[For this unit, the Bases for the Allowable Values and trip setpoints are as follows:]

APPLICABILITY	The DG - LOVS actuation Function is required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. In MODES 5 and 6, automatic start of an EDG is not assumed in the applicable safety analyses. Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE, so that it can perform its function on a loss of power or degraded power to the vital bus.
ACTIONS	A LOVS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's Function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint

BASES

ACTIONS (continued)

Required Action C.1 requires all but two channels to be restored to OPERABLE status within 1 hour [or in accordance with the Risk Informed Completion Time Program]. With more than two channels inoperable, the logic is not capable of providing a DG - LOVS signal for valid Loss of Voltage or Degraded Voltage conditions. The 1 hour Completion Time is reasonable to evaluate and take action to correct the degraded condition in an orderly manner and takes into account the low probability of an event requiring LOVS occurring during this interval.

D.1

Condition D applies if the Required Actions and associated Completion Times are not met.

Required Action D.1 ensures that Required Actions for the affected DG inoperabilities are initiated. ~~Depending upon plant MODE, t~~The actions specified in LCO 3.8.1, "AC Sources - Operating," ~~or LCO 3.8.2~~ are required immediately.

SURVEILLANCE
REQUIREMENTS

The following SRs apply to each DG - LOVS Function.

[SR 3.3.6.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated output of the potential transformers that feed the LOVS undervoltage relays. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two channels could be an indication of excessive drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE.]

[The Frequency, about once every shift, is based upon operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The

BASES

LCO

The LCO for the LOVS requires that four channels per bus of each LOVS instrumentation Function be OPERABLE in MODES 1, 2, 3, and 4. ~~and when the associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources—Shutdown."~~ The LOVS supports safety systems associated with the ESFAS. ~~In MODES 5 and 6, the four channels must be OPERABLE whenever the associated DG is required to be OPERABLE to ensure that the automatic start of the DG is available when needed.~~

Actions allow maintenance (trip channel) bypass of individual channels. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). At units where adequate channel to channel independence has been demonstrated, specific exceptions have been approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.

Loss of LOVS Function could result in the delay of safety system initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power, which is an anticipated operational occurrence, the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only the one turbine driven pump as well as an increased potential for a loss of decay heat removal through the secondary system.

Only Allowable Values are specified for each Function in the LCO. Nominal trip setpoints are specified in the plant specific setpoint calculations. The nominal setpoints are selected to ensure that the setpoint measured by CHANNEL FUNCTIONAL TESTS does not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within the Allowable Value, is acceptable, provided that operation and testing is consistent with the assumptions of the plant specific setpoint calculation. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

[For this unit, the Bases for the Allowable Values and trip setpoints are as follows:]

APPLICABILITY

The DG - LOVS actuation Function is required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. **In MODES 5 and 6, automatic start of an EDG is not assumed in the applicable safety analyses.** ~~Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE, so that it can perform its function on a loss of power or degraded power to the vital bus.~~

BASES

ACTIONS (continued)

Required Action C.1 requires all but two channels to be restored to OPERABLE status within 1 hour. With more than two channels inoperable, the logic is not capable of providing the DG - LOVS signal for valid Loss of Voltage or Degraded Voltage conditions. The 1 hour Completion Time is reasonable to evaluate and take action to correct the degraded condition in an orderly manner and takes into account the low probability of an event requiring LOVS occurring during this interval.

D.1

Condition D applies if the Required Actions and associated Completion Times are not met.

Required Action D.1 ensures that Required Actions for the affected DG inoperabilities are initiated. ~~Depending upon plant MODE, the~~ ACTIONS specified in LCO 3.8.1, "AC Sources - Operating," ~~or LCO 3.8.2~~ are required immediately.

SURVEILLANCE
REQUIREMENTS

The following SRs apply to each DG - LOVS Function.

[SR 3.3.7.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated output of the potential transformers that feed the LOVS undervoltage relays. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two channels could be an indication of excessive drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.]

[Agreement criteria are determined by the plant staff based on a combination of channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

[The Frequency, about once every shift, is based upon operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of

BASES

APPLICABLE SAFETY ANALYSES (continued)

significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

- a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.
- b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.
- c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.
- d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

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

LCO

One offsite circuit capable of supplying the onsite Class 1E power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems - Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with a distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required offsite circuit and **the ability to manually start a** DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents [involving handling recently irradiated fuel]).

The qualified offsite circuit must be capable of providing three phases of AC power, maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the unit.

BASES

LCO (continued)

[Offsite circuit #1 consists of Safeguards Transformer B, which is supplied from Switchyard Bus B, and is fed through breaker 52-3 powering the ESF transformer XNBO1, which, in turn, powers the #1 ESF bus through its normal feeder breaker. The second offsite circuit consists of the Startup Transformer, which is normally fed from the Switchyard Bus A, and is fed through breaker PA 0201 powering the ESF transformer, which, in turn, powers the #2 ESF bus through its normal feeder breaker.]

The DG must be capable of **being manually started**~~starting~~, accelerating to rated speed and voltage, connecting to its respective ESF bus, **and on detection of bus undervoltage, and**~~accepting~~ required loads. ~~This sequence must be accomplished within [10] seconds. The DG must be capable of accepting required loads within the assumed loading sequence intervals, and must continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.~~

~~Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.~~

~~[In addition, proper sequencer operation is an integral part of offsite circuit OPERABILITY since its inoperability impacts on the ability to start and maintain energized loads required OPERABLE by LCO 3.8.10.]~~

It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of [recently] irradiated fuel assemblies provide assurance that:

- a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies,
- b. Systems needed to mitigate a fuel handling accident [involving handling [recently] irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)] are available,
- c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and

BASES

ACTIONS (continued)

concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS are not entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 provides the appropriate restrictions for the situation involving a de-energized train.

SURVEILLANCE
REQUIREMENTSSR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.8 is not required to be met since only one offsite circuit is required to be OPERABLE. **SR 3.8.1.7, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.13, SR 3.8.1.15, [SR 3.8.1.18], and SR 3.8.1.19 are not required to be met because DG start and load within a specified time and response on an offsite power or ECCS initiation signal is not not assumed in the accident analysis.** ~~SR 3.8.1.12 and SR 3.8.1.19 are not required to be met because the ESF actuation signal is not required to be OPERABLE.~~ SR 3.8.1.17 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with DG(s) that are not required to be OPERABLE.

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note **which precludes** ~~The reason for the Note is to preclude~~ requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of SRs, and to preclude deenergizing a required 4160 V ESF bus or disconnecting a required offsite circuit during performance of SRs. With limited AC Sources available, a single event could compromise both the required circuit and the DG. It is the intent that **the DG and offsite circuit** ~~these SRs~~ must still be capable of **satisfying the acceptance criteria in these SRs**~~being met~~, but actual performance is not required during periods when the DG and offsite circuit is required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

REFERENCES None.
