ENCLOSURE 2

VOLUME 13

ST. LUCIE PLANT
UNIT 1 AND UNIT 2

IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.8
ELECTRICAL SYSTEMS

Revision 0

LIST OF ATTACHMENTS

1. ITS 3.8.1, AC Sources – Operating
2. ITS 3.8.2, AC Sources – Shutdown
3. ITS 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air
4. ITS 3.8.4, DC Sources – Operating
5. ITS 3.8.5, DC Sources – Shutdown
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7. ITS 3.8.7, Inverters – Operating
8. ITS 3.8.8, Inverters – Shutdown
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10. ITS 3.8.10, Distribution Systems – Shutdown

ATTACHMENT 1

ITS 3.8.1, AC Sources - Operating

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

LCO 3.8.1 3.8.1.1 T ~~As a minimum, t~~he following A~~.~~C~~.~~ electrical ~~power~~ sources shall be OPERABLE:

qualified

LCO 3.8.1.a a. Two ~~physically independent~~ circuits between the offsite transmission network and the onsite Class 1E ~~distribution system~~, and LA01

AC Electrical Power Distribution System

LCO 3.8.1.b b. Two ~~separate and independent~~ diesel generator ~~sets~~ each ~~with~~: LA01

s (DGs) Day Insert 1

SR 3.8.1.4 1. ~~Engine-mounted fuel~~ tanks containing a minimum of 152 gallons of fuel, A01

2. A separate fuel storage system containing a minimum of 19,000 gallons of fuel, and

See ITS 3.8.3

~~3. A separate fuel transfer pump.~~ LA01

Applicability **APPLICABILITY**: MODES 1, 2, 3 and 4.

ACTION:

ACTION A a. With one offsite circuit ~~of 3.8.1.1.a~~ inoperable~~, except as provided in Action f below:~~ LA02

ACTION A.1 1. ~~Demonstrate the OPERABILITY of the remaining A.C. sources by~~ P ~~p~~erform~~ing~~ S~~urveillance~~ R~~equirement 4.8.1.1.1.a~~ within 1 hour and ~~at least~~ once per 8 hours thereafter.

3.8.1.1

ACTION A.2 2. Within 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required features(s), declare required features(s) with no offsite power available inoperable when its redundant required features(s) is inoperable.

ACTION A.3 3. Restore the offsite circuit to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

ACTION G.1 and G.2

ACTION G.2 NOTE 4. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

A01

INSERT 1

capable of supplying one train of the onsite Class 1E AC Electrical Power Distribution System.

A01

ELECTRICAL POWER SYSTEMS

ACTION (continued)

~~**NOTE**~~

~~If the absence of any common-cause failure cannot be confirmed, Surveillance Requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.~~

L01

b. O ~~With o~~ne diesel generator ~~of 3.8.1.1.b~~ inoperable:

ACTION B.1 1. P ~~Demonstrate the OPERABILITY of the A. C. sources by p~~erform~~ing~~ Surveillance Requirement ~~4.8.1.1.1.~~ 3.8.1.1 a within 1 hour and at least once per 8 hours thereafter.

ACTION B.2 2. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) ~~(including the steam driven auxiliary feed pump in MODE 1, 2, and 3),~~ declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable. LA03

3. ~~If the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing,~~ demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 3.8.1.2 ~~4.8.1.1.2.a.4~~ within ~~8~~ 24 hours, ~~unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG~~ or determine OPERABLE DG is not inoperable due to common cause failure within 24 hours.

LA04 A01 L02

ACTION B.3.2

ACTION B.3.1

ACTION B.4 4. Restore the diesel generator to OPERABLE status within 14 days~~*~~ or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. A02

ACTION G

ACTION G.2 NOTE 5. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

~~* A one-time AOT extension for the inoperable 1B EDG allows 30 days to restore the EDG to OPERABLE status. Compensatory Measure within FPL Letter L-2019-153 dated July 25, 2019 will remain in effect during the extended AOT period. This extension expires on August 14, 2019 at 0736 hours EDT.~~

A02

ELECTRICAL POWER SYSTEMS

ACTION (continued)

NOTE

ACTION D NOTE

1. Enter applicable ACTIONS of LCO 3.8.2.1, “A.C. Distribution - Operating,” when ACTION c is entered with no AC power to any train.
2. ~~If the absence of any common-cause failure cannot be confirmed, Surveillance Requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.~~

L01

ACTION D

c. With one offsite ~~A.C.~~ circuit and one diesel generator inoperable:

ACTION A.1
ACTION B.1

1. Demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement ~~4.8.1.1.1.a~~ 3.8.1.1 within one hour and at least once per 8 hours thereafter.

ACTION B.2

2. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) ~~(including the steam driven auxiliary feed pump in MODE 1, 2, and 3),~~ declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

LA03

ACTION B.3.2
ACTION B.3.1

3. ~~If the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing,~~ demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement ~~4.8.1.1.2.a.4~~ 3.8.1.2 within ~~8~~ 24 hours ~~unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*~~ or determine OPERABLE DG is not inoperable due to common cause failure within 24 hours.

LA04

L02

A02

ACTIONs D.1 and D.2
ACTION G

4. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

L02

ACTION G.2 NOTE

5. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.
6. ~~Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 ACTION a or b, as appropriate, with the time requirement of that ACTION based on the time of the initial loss of the remaining inoperable A.C. power source.~~

A03

ACTION C

d. With two ~~of the required~~ offsite A.C. circuits inoperable:

ACTION C.1

1. Within 12 hours from discovery of two offsite circuits inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) inoperable when its redundant required feature(s) is inoperable.

ACTION C.2
ATION F.1

2. Restore one of the inoperable offsite sources to OPERABLE status within 24 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours.
3. ~~Following restoration of one offsite source, follow ACTION a with the time requirement of that ACTION based on the time of the initial loss of the remaining inoperable offsite A.C. circuit.~~

A03

ELECTRICAL POWER SYSTEMS

ACTION (continued)

ACTION E
ACTION B.1
ACTION E
ACTION G
ACTION G NOTE

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 3.8.1.1 ~~4.8.1.1.1.a~~ within 1 hour and at least once per 8 hours thereafter; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. ~~Following restoration of one diesel generator unit, follow ACTION Statement b. with he time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable diesel generator.~~ A03

ACTION A
ACTION A.1
ACTION A.3
ACTION F

With one offsite circuit inoperable

~~f. With one Unit 1 startup transformer (1A or 1B) inoperable and with a Unit 2 startup transformer (2A or 2B) connected to the same A or B offsite power circuit and administratively available to both units, then should Unit 2 require the use of the startup transformer administratively available to both units,~~ Unit 1 shall demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 3.8.1.1 ~~4.8.1.1.1.a~~ within 1 hour and at least once per 8 hours thereafter. Restore the inoperable startup transformer to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and MODE 4 ~~COLD SHUTDOWN~~ within 12 ~~the following 30~~ hours. LA02 L03

ACTIONs NOTE

g. LCO 3.0.4.b is not applicable to diesel generators.

Insert proposed ACTION H M01

SURVEILLANCE REQUIREMENTS

SR 3.8.1.1 4.8.1.1.1 Each of the above required ~~independent~~ circuits between the offsite transmission network and the onsite Class 1E distribution system shall be: LA01

SR 3.8.1.1 a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments, indicated power availability; and

SR 3.8.1.8 b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring (manually and automatically) unit power supply from the auxiliary transformer to the startup transformer.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

SR 3.8.1.4 1. Verifying fuel level in the day tanks ~~engine-mounted fuel tank~~,

2. Verifying the fuel level in the fuel storage tank, See ITS 3.8.3

SR 3.8.1.6 3. Verify~~ing~~ the fuel oil transfer ~~pump can be started and~~ system operates to automatically transfer~~s~~ fuel from the storage tanks ~~system~~ to the day tanks ~~engine-mounted tank~~, M02

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.2
SR 3.8.1.7

4. Verifying ~~the~~ each diesel starts from ~~ambient~~ standby condition ~~and accelerates to approximately 900 rpm~~ in less than or equal to 10 seconds**. The generator voltage and frequency shall be ≥ 3950V and ≥ 59.4 Hz within 10 seconds and achieve a steady state voltage and frequency of 4160 ± ~~420~~ 210 volts and 60 ± ~~1.2~~ 0.6 Hz ~~within 10 seconds after the start signal~~**. ~~The diesel generator shall be started for this test by using one of the following signals:~~ L04 L04

~~a) Manual/Local~~ L05

~~b) Simulated loss-of-offsite power by itself.~~

~~c) Simulated loss-of-offsite power in conjunction with an ESF actuation test signal.~~

~~d) An ESF actuation test signal by itself.~~

Add proposed SR 3.8.1.3 Note 1 A04
Add proposed SR 3.8.1.3 Note 3 M03
Add proposed SR 3.8.1.3 Note 4 M04

SR 3.8.1.3

SR 3.8.1.3
NOTE 2

5. Verifying the generator is synchronized~~,~~ and loaded ~~to greater than or equal to 3500 kW~~ in accordance with the manufacturer's recommendations and operates within a load band of 3300 to 3500 kW*** for ~~at least an additional~~ ≥ 60 minutes~~, and~~ L06

~~6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.~~ LA05

b. ~~By removing~~ Check for and remove accumulated water

SR 3.8.1.5

1. From ~~the engine-mounted fuel~~ each day tank in accordance with the Surveillance Frequency Control Program ~~and after each occasion when the diesel is operated for greater than 1 hour, and~~ L07

2. From the storage tank in accordance with the Surveillance Frequency Control Program.

See ITS 3.8.3

SR 3.8.1.2
SR 3.8.1.7

** The diesel generator start (10 sec.) from ambient conditions shall be performed in accordance with the Surveillance Frequency Control Program in these surveillance tests. All other diesel generator starts for the purposes of this surveillance testing may be preceded by an engine prelube period and may also include warmup procedures (e.g., gradual acceleration) as recommended by the manufacturer ~~so that mechanical stress and wear on the diesel generator is minimized.~~ A05

SR 3.8.1.2
NOTEs 1 and 2
SR 3.8.1.7
NOTE

SR 3.8.1.3
NOTE 2

*** ~~The indicated load band is meant as guidance to avoid routine overloading.~~ Variations in loads in excess of the band due to changing bus loads shall not invalidate this test. A06

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

c. Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.

See ITS 3.8.3

SR 3.8.1.9
SR 3.8.1.10
SR 3.8.1.11
SR 3.8.1.12
SR 3.8.1.13
SR 3.8.1.14
SR 3.8.1.15
SR 3.8.1.16
SR 3.8.1.17

~~d. DELETED~~

e. In accordance with the Surveillance Frequency Control Program by:

~~1. DELETED~~

2.

Insert proposed SR 3.8.1.9 NOTE 2

M05

SR 3.8.1.9 NOTE 1, Part 2

Insert proposed SR 3.8.1.9.a

NOTE

Insert 2

Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.9.b and c

L08

Verify~~ing~~ each generator ~~capability to~~ reject ~~the~~ s a load greater than or equal to its associated single largest post-accident load ~~while maintaining~~ and within 1.8 seconds following load rejection voltage at 4160 ± ~~420~~ 210 volts and frequency at 60 ± ~~1.2~~ 0.6 Hz.

3.

SR 3.8.1.10 NOTE 2

NOTE

This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.10 Verifying that upon an actual or simulated loss of offsite power signal ~~by itself~~.

SR 3.8.1.10.a a) Deenergization of the emergency busses

SR 3.8.1.10.b and load shedding from the emergency busses.

M05

INSERT 2

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

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.8.1.10.c

b) The diesel starts on the auto-start signal****, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencer~~r~~ timers and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 + 210 volts and 60 + 0.6 Hz during this test.

4.

SR 3.8.1.11 NOTE 2

NOTE

This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.11

Verifying that upon an actual or simulated ESF actuation signal ~~(without loss-of-offsite power)~~ the diesel generator starts**** on the auto-start signal, and: A07

SR 3.8.1.11.a

a) Within 10 seconds, generator voltage and frequency shall be ~~4160 + 420 volts and 60 + 1.2 Hz~~ ≥ 3950 V and ≥ 59.4 Hz. L04

SR 3.8.1.11.c

b) Operates on standby for greater than or equal to 5 minutes.

SR 3.8.1.11.b

c) Steady-state generator voltage and frequency shall be 4160 + 210 volts and 60 + 0.6 Hz ~~and shall be maintained throughout this test~~. M06

Proposed SR 3.8.1.11 Requirements d and e.

5.

SR 3.8.1.17 NOTE 2
SR 3.8.1.12 NOTE

NOTE

This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.17

Verifying that upon an actual or simulated loss-of-offsite power signal in conjunction with an actual or simulated ESF actuation signal: L09

SR 3.8.1.17.a
SR 3.8.1.17.b

a) Deenergization of the emergency busses and load shedding from the emergency busses.

SR 3.8.1.10 NOTE 1
SR 3.8.1.11 NOTE 1

**** This test may be preceded by an ~~conducted in accordance with the manufacturer's recommendations concerning~~ engine prelube period. LA01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.8.1.17

b) The diesel starts on the auto-start signal****, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected emergency ~~(accident)~~ loads through the ~~auto-sequencer~~ load sequence timers and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 210 volts and 60 ± 0.6 Hz during this test.

SR 3.8.1.12

c) Verify each ~~All automatic~~ diesel generator's noncritical automatic trips~~, except engine overspeed and generator differential,~~ are ~~automatically~~ bypassed ~~up~~on actual or simulated loss of voltage signal on the emergency bus concurrent with a~~n~~ ~~safety injection~~ an actual or simulated ESF actuation signal.

LA06 L09

6. Add proposed SR 3.8.1.13 Note 3

M05

SR 3.8.1.13 Note 2

NOTE
Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.13

Verify~~ing the~~ each diesel generator operates for ~~at least~~ ≥ 24 hours~~****~~. During the first 2 hours ~~of this test~~, the diesel generator shall be loaded within a load band of 3800 to ~~3960~~ 3860 kW# and during the remaining 22 hours of this test, the diesel generator shall be loaded within a load band of 3300 to 3500 kW#. ~~The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.~~

A08 M09 L10

~~7. DELETED~~

8.

SR 3.8.1.14 Note

NOTE
This Surveillance shall not normally be performed in MODE 1, 2, 3 or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

Verifying the diesel generator's capability to:

SR 3.8.1.14

a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon actual or simulated restoration of offsite power.

b) Transfer its load to the offsite power source, and

c) Be restored to its standby status.

SR 3.8.1.13 Note 1

\# ~~This band is meant as guidance to avoid routine overloading of the engine.~~ Variations in load in excess of this band due to changing bus loads shall not invalidate this test. A06

SR 3.8.1.17 NOTE 1

**** This test may be ~~conducted in accordance with the manufacturer's recommendations concerning~~ preceded by an engine prelube period. LA01

ITS A01 ITS 3.8.1

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (continued)

9.

SR 3.8.1.15 NOTE

NOTE

This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.15 Verify~~ing that~~ with the diesel generator operating in a test mode ~~(~~connected to its bus~~)~~, an actual or simulated safety injection signal overrides the test mode by (1) returning the diesel generator to standby operation and (2) automatically energizes the emergency loads with offsite power.

~~10. DELETED~~

11.

SR 3.8.1.16 NOTE

NOTE

This Surveillance shall not normally be performed in MODE 1 or 2. However, the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.16 sequenced Verify~~ing that the~~ automatic load sequence timers are operable with the interval between each load block within ± 1 second of its design interval.

SR 3.8.1.18
SR 3.8.1.18 NOTE

f. In accordance with the Surveillance Frequency Control Program ~~or after any modification which could affect diesel generator independence~~ by starting**** the diesel generators simultaneously~~, during shutdown,~~ and verifying that the diesel generators ~~accelerate to approximately 900 rpm~~ in less than or equal to 10 seconds. achieves Insert proposed SR 3.8.1.18.a and b L11 L12 L04 M07

~~g. In accordance with the Surveillance Frequency Control Program by performing a pressure test of those portions of the diesel fuel oil system designed to USAS B31.7 Class 3 requirements in accordance with the Inservice Inspection Program.~~ LA07

~~4.8.1.1.3 Reports – (Not Used)~~

~~4.8.1.1.4 The Class 1E underground cable system shall be demonstrated OPERABLE within 30 days after the movement of any loads in excess of 80% of the ground surface design basis load over the cable ducts by pulling a mandrel with a diameter of at least 80% of the duct's inside diameter through a duct exposed to the maximum loading (duct nearest the ground's surface) and verifying that the duct has not been damaged.~~ LA08

~~# This band is meant as guidance to avoid routine overloading of the engine. Variations in load in excess of this band due to changing bus loads shall not invalidate this test.~~ A09

SR 3.8.1.18 NOTE **** This test may be ~~conducted in accordance with the manufacturer's recommendations concerning~~ preceded by an engine prelube period. LA01

A01

~~TABLE 3.4 8-1~~

~~DIESEL GENERATOR TEST SCHEDULE~~

~~(NOT USED)~~

A01

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

T

LCO 3.8.1 3.8.1.1 ~~As a minimum, t~~he following A~~.~~C~~.~~ electrical ~~power~~ sources shall be OPERABLE:

qualified

LA01

LCO 3.8.1.a a. Two ~~physically independent~~ circuits between the offsite transmission network and the onsite Class 1E ~~distribution system~~, and

AC Electrical Power Distribution System

LA01

LCO 3.8.1.b b. Two ~~separate and independent~~ diesel generators, each ~~with~~:

(DGs)

Insert 1

SR 3.8.1.4 1. Two separate engine-mounted fuel tanks containing a minimum volume of 238 gallons of fuel each,

2. A separate fuel storage system containing a minimum volume of 42,500 gallons of fuel, and

SR 3.8.1.6 3. A separate fuel transfer pump.

See ITS 3.8.3

Applicability **APPLICABILITY:** MODES 1, 2, 3, and 4.

ACTION:

Insert 2

A01

L01

ACTION A a. With one offsite circuit ~~of 3.8.1.1.a~~ inoperable~~, except as provided in ACTION f below:~~

ACTION A.1 1. P ~~Demonstrate the OPERABILITY of the remaining A. C. sources by p~~erform~~ing~~ S~~urveillance~~ R~~equirement~~ 4.8.1.1.1.a within 1 hour and ~~at least~~ once per 8 hours thereafter.

ACTION A.2 2. Within 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s), declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.

ACTION A.3

ACTION F.1 and F.2

3. Restore the offsite circuit to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

ACTION F.2 NOTE 4. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

A01

INSERT 1

capable of supplying one train of the onsite Class 1E AC Electrical Power Distribution System.

ELECTRICAL POWER SYSTEMS

ACTION (continued)

~~**NOTE**~~

~~If the absence of any common-cause failure cannot be confirmed, Surveillance requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.~~ L01

b. ~~With o~~ O ne diesel generator ~~of 3.8.1.1.b~~ inoperable:

ACTION B.1 1. ~~Demonstrate the OPERABILITY of the A.C. sources by p~~ P erform~~ing~~ Surveillance Requirement ~~4.8.1.1.1.a~~ 3.8.1.1 within 1 hour and at least once per 8 hours thereafter.

ACTION B.2 2. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) ~~(including the steam driven auxiliary feed pump in MODE 1, 2, and 3),~~ declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable. LA03

3. ~~If the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing,~~ LA04 demonstrate the OPERABILITY of the

ACTION B.3.2 remaining OPERABLE EDG by performing Surveillance Requirement 3.8.1.2 ~~4.8.1.1.2.a.4~~ within ~~8~~ 24 hours, L02 ~~unless it can be confirmed that the cause of the~~

ACTION B.3.1 ~~inoperable EDG does not exist on the remaining EDG~~. A01 or determine OPERABLE DG is not inoperable due to common cause failure within 24 hours

ACTION B.4 4. Restore the diesel generator to OPERABLE status within 14 days or in accordance with the Risk Informed Completion Time Program,

ACTION G or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION G.2 NOTE 5. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ELECTRICAL POWER SYSTEMS

ACTION: (Continued)

NOTE

- ~~If the absence of any common-cause failure cannot be confirmed, Surveillance Requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.~~ L01
- ACTION D NOTE — Enter applicable ACTIONS of LCO 3.8.3.1, "Onsite Power Distribution – Operating," when ACTION c is entered with no AC power to any train.

ACTION D — c. With one offsite A.C. circuit and one diesel generator inoperable:

ACTION A.1 ACTION B.1 — 1. Demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement ~~4.8.1.1.1.a~~ 3.8.1.1 within one hour and at least once per 8 hours thereafter.

ACTION B.2 — 2. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) ~~(including the steam driven auxiliary feed pump in MODE 1, 2, and 3),~~ declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable. LA03

3. ~~If the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing,~~ demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement ~~4.8.1.1.2.a.4~~ 3.8.1.2 within ~~8~~ 24 hours, ~~unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG~~. or determine OPERABLE DG is not inoperable due to common cause failure within 24 hours LA04 L02

ACTION B.3.2

ACTION B.3.1

ACTIONs D.1 and D.2 — 4. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or in accordance with the Risk Informed Completion Time Program,

ACTION G — or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION G.2 NOTE — 5. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

6. ~~Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 ACTION Statement a or b, as appropriate, with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable A.C. power source.~~ A03

ELECTRICAL POWER SYSTEMS

ACTION: (Continued)

ACTION C — d. With two ~~of the required~~ offsite A.C. circuits inoperable:

ACTION C.1 — 1. Within 12 hours from discovery of two offsite circuits inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) inoperable when its redundant required feature(s) is inoperable.

ACTION C.2 — 2. Restore one of the inoperable offsite sources to OPERABLE status within 24 hours or in accordance with the Risk Informed Completion Time Program or

ACTION F.1 — be in at least HOT STANDBY within the next 6 hours.

3. ~~Following restoration of one offsite source, follow ACTION a with the time requirement of that ACTION based on the time of the initial loss of the remaining inoperable offsite A.C. circuit.~~ A03

ACTION E — e. With two of the above required diesel generators inoperable,

ACTION B.1 — demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 3.8.1.1 ~~4.8.1.1.1.a within~~ 1 hour and at least once per 8 hours thereafter;

ACTION E — restore one of the inoperable diesel generators to OPERABLE status within 2 hours

ACTION G — or be in the at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION G NOTE — LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. ~~Following restoration of one diesel generator unit, follow ACTION Statement b. with the time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable diesel generator.~~ A03

ACTION A — ~~f.~~ With one offsite circuit inoperable ~~With one Unit 2 startup transformer (2A or 2B) inoperable and with a Unit 1 startup transformer (1A or 1B) connected to the same A or B offsite power circuit and administratively available to both units, then should Unit 1 require the use of the startup transformer administratively available to both units,~~ LA02

ACTION A.1 — Unit 2 shall demonstrate the operability of the remaining A.C. sources by performing Surveillance Requirement 3.8.1.1 ~~4.8.1.1.1a~~. within 1 hour and at least once per 8 hours thereafter.

ACTION A.3 — Restore the inoperable startup transformer to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program,

ACTION F — or be in at least HOT STANDBY within the next 6 hours and ~~COLD SHUTDOWN~~ MODE 4 within ~~the following 30~~ 12 hours. L03

ACTIONs NOTE — g. LCO 3.0.4.b is not applicable to diesel generators.

Insert proposed ACTION H M01

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required ~~independent~~ circuits between the offsite transmission network and the onsite Class 1E distribution system shall be: LA01

SR 3.8.1.1 — a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments, indicated power availability; and

SR 3.8.1.8 — b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.8.1.4 1. Verifying fuel level in the ~~engine-mounted fuel tank~~ day tanks,

2. Verifying the fuel level in the fuel storage tank, See ITS 3.8.3

SR 3.8.1.6 3. Verify~~ing~~ the fuel oil transfer ~~pump can be started and~~ system operates to automatically transfer~~s~~ fuel from the storage ~~system~~ tank to the ~~engine-mounted tank~~ each day tanks, M02

SR 3.8.1.2 SR 3.8.1.7 4. Verifying ~~the~~ each diesel starts from ~~ambient~~ standby condition ~~and accelerates to approximately 900 rpm~~ in less than or equal to 10 seconds**. The generator voltage and frequency shall be ≥ 3950V and ≥ 59.4 Hz within 10 seconds and achieve a steady state voltage and frequency of 4160 ± ~~420~~ 210 volts and 60 ± ~~1.2~~ 0.6 Hz ~~within 10 seconds after the start signal~~**. ~~The diesel generator shall be started for this test by using one of the following signals:~~ L04 L04

~~a) Manual/Local.~~

~~b) Simulated loss-of-offsite power by itself.~~

~~c) Simulated loss-of-offsite power in conjunction with an ESF actuation test signal.~~ L05

~~d) An ESF actuation test signal by itself.~~

Add proposed SR 3.8.1.3 Note 1 A04

Add proposed SR 3.8.1.3 Note 3 M03

Add proposed SR 3.8.1.3 Note 4 M04

SR 3.8.1.3 SR 3.8.1.3 NOTE 2 5. Verifying the generator is synchronized~~,~~ and loaded ~~to greater than or equal to 3685 kW~~ in accordance with the manufacturer's recommendations, and operates within a load band of 3450 to ~~3685~~ 3669 kW*** for ~~at least an additional~~ ≥ 60 minutes~~, and~~ L06 M10

~~6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.~~ LA05

b. ~~By removing~~ Check for and remove accumulated water:

SR 3.8.1.5 1. From ~~the engine-mounted fuel~~ each day tank in accordance with the Surveillance Frequency Control Program ~~and after each occasion when the diesel is operated for greater than 1 hour, and~~ L07

2. From the storage tank in accordance with the Surveillance Frequency Control Program. See ITS 3.8.3

SR 3.8.1.2 SR 3.8.1.7 SR 3.8.1.2 NOTEs 1 and 2 SR 3.8.1.7 NOTE ** The diesel generator start (10 sec.) from ambient conditions shall be performed in accordance with the Surveillance Frequency Control Program in these surveillance tests. All other diesel generator starts for purposes of this surveillance testing may be preceded by an engine prelube period and may also include warmup procedures (e.g., gradual acceleration) as recommended by the manufacturer ~~so that mechanical stress and wear on the diesel generator is minimized~~. A05

SR 3.8.1.3 NOTE 2 *** ~~The indicated load band is meant as guidance to avoid routine overloading.~~ Variations in loads in excess of the band due to changing bus loads shall not invalidate this test. A06

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (continued)

c. Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.

See ITS 3.8.3

SR 3.8.1.9
SR 3.8.1.10
SR 3.8.1.11
SR 3.8.1.12
SR 3.8.1.13
SR 3.8.1.14
SR 3.8.1.15
SR 3.8.1.16
SR 3.8.1.17
SR 3.8.1.19
SR 3.8.1.20

~~d. DELETED~~

e. In accordance with the Surveillance Frequency Control Program by:

~~1. DELETED~~

2.

Insert proposed SR 3.8.1.9 NOTE 2

M05

SR 3.8.1.9
NOTE 1, Part 2

Insert proposed
SR 3.8.1.9.a

NOTE

Insert 2

Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.9.b
and c

each

Verify~~ing~~ generator ~~capability to~~ reject ~~the~~ single largest post-accident load ~~while maintaining~~ voltage at 4160 + ~~420~~ volts and frequency at 60 + ~~1.2~~ Hz.

0.6

210

s a load greater than or equal to its associated

L08

3.

SR 3.8.1.19
NOTE 1. Part 2

and within 1.8 seconds following load rejection

NOTE

Insert 2

Insert proposed SR 3.8.1.19 NOTE 2

M08

Credit may be taken for unplanned events that satisfy this SR.

each DG does not trip, and voltage is maintained ≤

SR 3.8.1.19

Verify~~ing the generator capability to reject a load of 3685 kW without tripping. The generator voltage shall not exceed~~ 4784 volts during and following ~~the~~ load rejection.

a

of ≥ 3669 kW

M10

INSERT 2 ⓂM05 M08

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

A01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

4.

SR 3.8.1.10
NOTE 2

NOTE

This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.10 Verifying upon an actual or simulated loss-of-offsite power signal ~~by itself~~:

SR 3.8.1.10.a
SR 3.8.1.10.b

a. Deenergization of the emergency busses and load shedding from the emergency busses.

SR 3.8.1.10.c

b. The diesel starts on the auto-start signal,**** energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequence~~r~~ timers and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 210 volts and 60 ± 0.6 Hz during this test.

5.

SR 3.8.1.11
NOTE 2

NOTE

This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.11 Verifying that upon an actual or simulated ESF actuation signal ~~(without loss-of-offsite power)~~ the diesel generator starts**** on the auto-start signal, and: A07

SR 3.8.1.11.a a) Within 10 seconds, generator voltage and frequency shall be ~~4160 ± 420 volts and 60 ± 1.2 Hz~~ ≥ 3950 V and ≥ 59.4. L04

SR 3.8.1.11.c b) Operates on standby for greater than or equal to 5 minutes.

SR 3.8.1.11.b c) Steady-state generator voltage and frequency shall be 4160 ± 210 volts and 60 ± 0.6 Hz and shall be maintained throughout this test.

Insert proposed SR 3.8.1.11 Requirements d and e. M06

SR 3.8.1.10
NOTE 1
SR 3.8.1.11
NOTE 1

**** This test may be ~~conducted in accordance with the manufacturer's recommendations concerning~~ preceded by an engine prelube period. LA01

A01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

6.

SR 3.8.1.12
NOTE
SR 3.8.1.17
NOTE 2

> **NOTE**
> This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.17

Verifying that upon an actual or simulated loss-of-offsite power in conjunction with an actual or simulated ESF actuation signal: L09

SR 3.8.1.17.a
SR 3.8.1.17.b

a) Deenergization of the emergency busses and load shedding from the emergency busses.

SR 3.8.1.17

b) The diesel starts on the auto-start signal,**** energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected emergency (accident) loads through the load sequence~~r~~ timers and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 210 volts and 60 ± 0.6 Hz during this test.

SR 3.8.1.12

c) Verify~~ing that all automatic~~ each diesel generator 's noncritical automatic trips~~, except engine overspeed and generator differential,~~ are ~~automatically~~ bypassed ~~up~~on actual or simulated loss of voltage signal on the emergency bus concurrent with ~~a safety injection~~ an actual or simulated ESF actuation signal. LA06 L09

7.

SR 3.8.1.13
Note 2

> Add proposed SR 3.8.1.13 Note 3
> **NOTE**
> Credit may be taken for unplanned events that satisfy this SR.

M05

SR 3.8.1.13

Verify~~ing the~~ each diesel generator operates for ~~at least~~ ≥ 24 hours.~~****~~ During the first 2 hours of this test, the diesel generator shall be loaded within a load band of 3800 to ~~3985~~ 3934 kW$^{\#}$ and during the remaining 22 hours of this test, the diesel generator shall be loaded within a load band of 3450 to ~~3685~~ 3669 kW$^{\#}$. ~~The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test.~~

A08 M09 M10 L10

~~8. DELETED~~

SR 3.8.1.13
NOTE 1

\# ~~This band is meant as guidance to avoid routine overloading of the engine.~~ Variations in load in excess of this band due to changing bus loads shall not invalidate this test. A06

SR 3.8.1.17
NOTE 1

**** This test may be ~~conducted in accordance with the manufacturer's recommendations concerning~~ preceded by an engine prelube period. LA01

A01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

9.

SR 3.8.1.14 Note

NOTE
This Surveillance shall not normally be performed in MODE 1, 2, 3 or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

Verifying the diesel generator's capability to:

SR 3.8.1.14

a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon actual or simulated restoration of offsite power signal.

b) Transfer its load to the offsite power source, and

c) Be restored to its standby status.

10.

SR 3.8.1.15 NOTE

NOTE
This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.15

Verify~~ing that~~ with the diesel generator operating in a test mode ~~(~~connected to its bus~~)~~, an actual or simulated safety injection signal overrides the test mode by (1) returning the diesel generator to standby operation and (2) automatically energizes the emergency loads with offsite power.

~~11. DELETED~~

12.

SR 3.8.1.16 NOTE

NOTE
This Surveillance shall not normally be performed in MODE 1 or 2. However, the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.16

sequenced

Verify~~ing that the~~ automatic load sequence timers are operable with the interval between each load block within ±1 second of its design interval.

SR 3.8.1.20

SR 3.8.1.20 NOTE 1, Part 1

a DG start

13. Performing ~~Surveillance Requirement 4.8.1.1.2a.4~~ within 5 minutes of shutting down the diesel generator after it has operated within a load band of 3450 kW to ~~3685~~ kW# for at least 2 hours or until operating temperatures have stabilized.

3669

A10

M10

SR 3.8.1.20 NOTE 1, Part 2

\# ~~This band is meant as guidance to avoid routine overloading of the engine.~~ Variations in load in excess of this band due to changing bus loads shall not invalidate this test.

A06

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.8.1.18 f. In accordance with the Surveillance Frequency Control Program ~~or after any modifications which could affect diesel generator interdependence~~ by starting**** the diesel generators simultaneously~~, during shutdown,~~ and verifying that the diesel generators achieves ~~accelerate to approximately 900 rpm~~ in less than or equal to 10 seconds. Insert proposed SR 3.8.1.18.a and b L11 L12 L04 M07

~~g. In accordance with the Surveillance Frequency Control Program by performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code in accordance with the Inservice Inspection Program.~~ LA07

~~4.8.1.1.3 Reports – (Not Used).~~

~~4.8.1.1.4 The Class 1E underground cable system shall be demonstrated OPERABLE within 30 days after the movement of any loads in excess of 80% of the ground surface design basis load over the cable ducts by pulling a mandrel with a diameter of at least 80% of the duct's inside diameter through a duct exposed to the maximum loading (duct nearest the ground's surface) and verifying that the duct has not been damaged.~~ LA08

SR 3.8.1.18 NOTE **** This test may be preceded by an ~~conducted in accordance with the manufacturer's recommendations concerning~~ engine prelube period. LA01

~~TABLE 4.8-1~~

~~DIESEL GENERATOR TEST SCHEDULE~~

~~(NOT USED)~~

DISCUSSION OF CHANGES
ITS 3.8.1, AC SOURCES - OPERATING

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 **Unit 1 only:** CTS 3.8.1.1 Actions b.4 and c.3 contain footnote * that applies a “one time extension for the inoperable 1B EDG” to allow 30 days to restore the diesel generator to OPERABLE status. The extension expired on August 14, 2019. Footnote * is deleted and not included in ITS. The change is designated as administrative and does not result in technical changes to the CTS.

A03 CTS 3.8.1.1 Actions c.6, d.3, and last sentence of Action e, each provide requirements to follow other CTS 3.8.1.1 Actions upon restoration of the inoperable equipment. The ITS provide these requirements in Section 1.3, Completion Times. This changes the CTS by removing the requirements on application of Completion Times from individual CTS Actions to the use and application chapter in ITS.

The purpose of the CTS requirement to follow other actions upon restoration of the inoperable equipment is to provide direction, when multiple components are inoperable, on the appropriate application of action completion times when one component remains inoperable following the restoration of other required equipment. These CTS requirements were added as a result of adopting portions of the ISTS without fully converting to the ISTS.

ITS includes Section 1.3, “Completion Times,” which provides requirements on the proper use and application of Completion Times when components remain inoperable following restoration of other equipment. Therefore, it is unnecessary to duplicate the requirements in individual Specifications. This change is designated as administrative because the CTS requirements are consistent with the Completion Time requirements in ITS Section 1.3 and does not result in technical changes to the CTS.

A04 Unit 1 CTS 4.8.1.1.2.a.5 requires that the DG is synchronized, loaded to greater than or equal to 3500 kW in accordance with the manufacturer’s recommendations and operates within a load band of 3300 to 3500 kW for at least an additional 60 minutes. Unit 2 CTS 4.8.1.1.2.a.5 requires that the DG is synchronized, loaded to greater than or equal to 3685 kW in accordance with the manufacturer’s recommendations, and operates within a load band of 3450 to 3685 kW for at least an additional 60 minutes. ITS SR 3.8.1.3 is modified by Note 1 that states DG loadings may include gradual loadings as recommended by the manufacturer. This changes the CTS by allowing the DG loading to be gradual "as recommended by the manufacturer."

The purpose of CTS 4.8.1.1.2.a.5 is to ensure each DG can be loaded from standby conditions and operated at load for at least one hour. The change to CTS 4.8.1.1.2.a.5 includes the intent provided by the manufacturer to continue the DG warmup by gradually loading the DG. This change is consistent with current practice and is not precluded by CTS. This change is consistent with the recommendations of Generic Letter (GL) 93-05, "Line- Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation." GL 93-05, Section 10.1, states that DGs "should be loaded in accordance with vendor recommendations for all test purposes other than the refueling outage loss of offsite power tests." The change is acceptable, because it will ensure the DGs will continue to be operated consistent with manufacturer recommendations. This change is designated as administrative, because it does not result in a technical change to the CTS.

A05 CTS Action 3.8.1.1.a.4 footnote ** includes the phrase, “so that mechanical stress and wear on the diesel generator is minimized” in addressing the allowed use of manufacturer recommended procedures. ITS does not include this additional clarifying information. Deleting this text does not change the allowance of engine prelube periods and warmup procedures as recommended by the manufacturer for performance of the applicable surveillance requirements.

The purpose of the phrase “minimizing mechanical stress and wear on the diesel generator” is to provide additional clarification for the allowance. This change is designated as administrative because it does not result in technical changes to the CTS.

A06 CTS 4.8.1.1.2.a.5 footnote *** includes the statement, “The indicated load band is meant as guidance to avoid routine overloading.” Unit 1 CTS 4.8.11.2.e.6, Unit 2 CTS 4.8.11.2.e.7 and Unit 2 CTS 4.8.11.2.e.13 footnote # includes the statement, “This band is meant as guidance to avoid routine overloading of the engine.” ITS does not include this additional clarifying information. Deleting this text does not change the allowance for variations in loads outside of the stated band due to changing bus loads when meeting the surveillance criteria.

The purpose of the statements is clarification of the load band in justifying the allowance of variations in loads due to bus load changes during performance of the surveillance. This change is designated as administrative because it does not result in technical changes to the CTS.

A07 Unit 1 CTS 4.8.1.1.2.e.4 and Unit 2 CTS 4.8.1.1.2.e.5 require verification that on an ESF actuation signal (without loss of offsite power), each DG starts and operates for greater than or equal to 5 minutes. ITS SR 3.8.1.11 require a similar test but do not specify that the DG auto-start on an ESF actuation signal is "without loss of offsite power." This changes the CTS by not specifying the DG auto-start on an ESF actuation signal is without a loss of offsite power signal.

The purpose of Unit 1 CTS 4.8.1.1.2.e.4 and Unit 2 CTS 4.8.1.1.2.e.5 is to demonstrate that each DG automatically starts on an actual or simulated ESF actuation signal. The requirements of this Surveillance are retained in the ITS as SR 3.8.1.11. This change is acceptable, because it is understood that the CTS Unit 1 4.8.1.1.2.e.4 and Unit 2 CTS 4.8.1.1.2.e.5 required DG start on an ESF actuation signal is without a loss of offsite power signal. Therefore, it is unnecessary to provide this information in ITS SR 3.8.1.11. This change is designated as administrative because it does not result in a technical change to the CTS.

A08 Unit 1 CTS 4.8.1.1.2.e.6 and Unit 2 CTS 4.8.1.1.2.e.7 require the DG to operate for at least 24 hours and contains a **** footnote indicating the test may be conducted in accordance with manufacturer's recommendation concerning engine prelube period. ITS SR 3.8.1.13 does not retain this note because the note is related to DG start tests and not associated with the DG 24 hour load run test. ITS Surveillances related to DG starting contain a similar note allowing engine prelube prior to the DG start. This change is designated as administrative because it does not result in a technical change to the CTS.

A09 **Unit 1 only**: CTS page 3/4.8-6b contains a # footnote not associated with any requirement on the page. ITS does not retain this footnote. The change is designated as administrative and does not result in technical changes to the CTS.

A10 **Unit 2 only**: CTS 4.8.1.1.2.e.13 requires performing Surveillance Requirement 4.8.1.1.2a.4 within 5 minutes of shutting down the diesel generator following a load run (i.e., DG hot restart test). ITS SR 3.8.1.20 retains this requirement as Note 2 to the Surveillance and instead of referencing another Surveillance to perform, ITS SR 3.8.1.20 explicitly provides the DG start requirements. Refer to DOC L04 for changes to CTS 4.8.1.1.2.a.4. The change is designated as administrative because explicitly stating the requirements of a Surveillance instead of referencing the Surveillance does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 The St. Lucie Plant (PSL) CTS do not contain a Condition for three or more AC sources inoperable. ITS ACTION H requires immediate entry into LCO 3.0.3 when three or more AC sources are inoperable. This changes the CTS by adding a specific Action requiring entry into LCO 3.0.3 when three or more AC sources are inoperable.

The addition of ITS ACTION is acceptable because it addresses a level of degradation in which all redundancy in AC electrical power supplies has been lost and any further losses in the AC electrical power system will result in loss of safety function. This change is designated as more restrictive because additional requirements are being imposed that limit unit operation in the event of 3 or more AC sources inoperable.

M02 CTS 4.8.1.1.2.a.3 requires verification that the fuel transfer pump can be started and transfer fuel from the storage system to the day tank. ITS SR 3.8.1.6 requires verification the fuel oil transfer system operates to automatically transfer fuel oil from the storage tanks to the day tanks. This changes the CTS requirement from verifying that the fuel oil transfer pump can be started and transfer fuel from the storage system to requiring verification that the fuel oil transfer system operates to automatically transfer fuel oil from the storage tanks to the day tanks.

The purpose of CTS 4.8.1.1.2.a.3 is to demonstrate that each fuel oil transfer pump operates and transfers fuel oil from the storage tanks to the day tanks. The proposed change demonstrates that the fuel oil transfer system operates to automatically transfer fuel to the day tank of each DG engine to support continuous operation of the standby power source. The change is acceptable because the fuel transfer system consists of a transfer pump, day tank isolation valves and day tank level switches that operate in conjunction to automatically maintain DG engine day tank level in standby conditions and also ensure adequate fuel supply to an operating diesel generator for continuous operation. In addition, this change demonstrates that the controls and control system for automatic fuel transfer is OPERABLE. This change is designated as more restrictive because it requires demonstration of automatic operation of the fuel oil transfer system.

M03 CTS 4.8.1.1.2.a.5 requires each DG to be synchronized, loaded, and operated for at least 60 minutes. ITS SR 3.8.1.3 requires the same test however an additional Note has been added that places a restriction on the test. ITS SR 3.8.1.3 Note 3 modifies the CTS requirements by stating that the SR shall be on only one DG at a time. This changes the CTS by adding a restriction when performing this test.

The purpose of CTS 4.8.1.1.2.a.5 is to ensure the DG can supply the emergency loads. This change is acceptable because DG loading during performance of CTS 4.8.1.1.2.a.5 is usually conducted one DG at a time. This change is designated as more restrictive because an explicit restriction is added to the DG load test.

M04 CTS 4.8.1.1.2.a.5 requires each DG to be synchronized, loaded, and operated for at least 60 minutes. ITS SR 3.8.1.3 requires the same test however an additional Note has been added that places a restriction on the test. ITS SR 3.8.1.3 Note 4 modifies the CTS requirements by stating that the SR shall be preceded by and immediately follow, without a shutdown of the DG, a successful performance of ITS SR 3.8.1.2 or ITS SR 3.8.1.7. This changes the CTS by adding a restriction when performing this test.

The purpose of CTS 4.8.1.1.2.a.5 is to ensure the DG can supply the emergency loads. This change is acceptable because DG loading during performance of CTS 4.8.1.1.2.a.5 is usually conducted without shut down after a successful start during performance of CTS 4.8.1.1.2.a.4. This change is designated as more restrictive because an explicit restriction is added to the DG load test.

M05 Unit 1 CTS 4.8.1.1.2.e.2, Unit 1 CTS 4.8.1.1.2.e.6, Unit 2 CTS 4.8.1.1.2.e.2 and Unit 2 CTS 4.8.1.1.2.e.7 require the testing of each DG with a load rejection greater than or equal to the single largest post-accident load. The respective CTS requires verifying the diesel generator operates for at least 24 hours under specific loaded conditions. The Surveillances do not specify that the testing be performed under certain unit conditions, nor that a DG shall be tested at a specific power factor. ITS SR 3.8.1.9 requires the verification that each DG can reject a load equal to or greater than its associated single largest post-accident load. Unit 1 ITS SR 3.8.1.13 requires verifying each DG operates for ≥ 24 hours; for ≥ 2 hours loaded ≥ 3800 kW and ≤ 3860 kW and for the remaining hours of the test loaded ≥ 3300 kW and ≤ 3500 kW. Unit 2 ITS SR 3.8.1.13 requires verifying each DG operated for ≥ 24 hours; for ≥ 2 hours loaded ≥ 3800 kW and ≤ 3934 kW and for the remaining hours of the test loaded ≥ 3450 kW and ≤ 3669 kW. Two Notes modify these SRs. ITS SR 3.8.1.9 Note 1 states that for the associated unit's DGs, the Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. ITS SR 3.8.1.9 Note 2 and Unit 1 ITS SR 3.8.1.13 and Unit 2 ITS 3.8.1.13 Note 3 state that if the Surveillance is performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. This changes the CTS requirement by specifying conditions for when the associated unit DGs are normally tested and by specifying a power factor of ≤ 0.9 if the testing is conducted by synchronizing with the offsite sources. Other changes to Unit 1 and Unit 2 CTS 4.8.1.1.2.e.2 (ITS SR 3.8.1.9), Unit 1 CTS 4.8.1.1.2.e.6 (ITS 3.8.1.13) and Unit 2 CTS 4.8.1.1.2.e.7 (ITS 3.8.1.13) are discussed in DOC L08 and DOC L10.

The addition of ITS SR 3.8.1.9 Notes 1 and 2, ITS SR 3.8.1.13 Note 3 is acceptable, because performance of the Surveillance for the associated unit's DGs could cause perturbations to the electrical distribution systems. Restricting normal performance of the Surveillance on the associated unit's DGs during MODES 1 and 2 minimizes challenges to continued steady state operation and, as a result, the unit's safety systems. However, if an assessment of the risks indicates plant safety is maintained or enhanced, the Surveillance can be performed to reestablish OPERABILITY. The addition of ITS SR 3.8.1.9 Note 2, Unit 1 ITS SR 3.8.1.13 Notes 2 Note 3, and Unit 2 ITS SR 3.8.1.14 Notes 2 and 3 is acceptable, because the testing should be conducted as close as possible to the conditions that would be experienced by a DG following an accident. Loading the DG solely with the inductive characteristics of a large motor will create a power factor less than unity. The design of the DG is set for full power operation with a power factor of ≥ 0.8. Therefore, testing of the DG for a loss of the single largest load and at full load is acceptable with a power factor ≤ 0.9. This change is designated as more restrictive because the testing required by the CTS does not currently contain these limitations.

M06 Unit CTS 4.8.1.1.2.e.4 and Unit 2 CTS 4.8.1.1.2.e.5 require each DG to auto-start on an ESF actuation signal and operate for greater than or equal to 5 minutes. ITS SR 3.8.1.11 requires the verification that each DG auto-start from standby condition and, in part, verify d) permanently connected loads remain energized from the offsite power system; and e) emergency loads are energized from the offsite power system. This changes the CTS by adding additional performance requirements for the ESF actuation test.

The purpose of the Unit 1 CTS 4.8.1.1.2.e.4 and Unit 2 CTS 4.8.1.1.2.e.5 is to test the performance of each DG on an ESF actuation signal. The proposed change adds explicit requirements to verify the permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power. The change is acceptable because verifying the connection of the permanent loads and emergency loads will confirm the DG loading logic. This change is designated as more restrictive because additional acceptance criteria have been added to the CTS.

M07 CTS 4.8.1.1.2.f requires the diesel generators to be started simultaneously and accelerate to approximately 900 rpm in less than or equal to 10 seconds. ITS SR 3.8.1.18 requires the diesel generators to achieve voltage ≥ 3950 V and frequency ≥ 59.4 Hz and steady state voltage ≥ 3950 V and ≤ 4370 V and frequency ≥ 59.4 Hz and ≤ 60.6 Hz in ≤ 10 seconds. This changes the CTS by replacing the 900 rpm criterion with generator voltage and frequency requirements.

The purpose of CTS 4.8.1.1.2.f is to demonstrate that diesel generator starting independence has not been compromised and that each engine can achieve proper generator output within the specified time when the diesel generators are started simultaneously. The proposed changes add explicit requirements that verify the engine achieves design speed (i.e., proper frequency) and the generator output satisfies the design voltage and frequency requirements. The change is acceptable because verification that proper diesel generator voltage and frequency is achieved within 10 seconds confirms diesel generator starting independence has not been compromised. This change is designated as more restrictive because additional acceptance criteria is added to the CTS. Additional changes to CTS 4.8.1.1.2.f are discussed in DOC L11 and DOC L12.

M08 **Unit 2 only:** CTS 4.8.1.1.2.e.3 requires verification of generator capability to reject a load of 3685 kW without tripping and shall not exceed 4784 volts during and following the load rejection. The Surveillance does not specify that the testing be performed under certain unit conditions, nor that a DG shall be tested at a specific power factor. ITS SR 3.8.1.19 requires the verification that each DG does not trip, and voltage is maintained ≤ 4784 V during and following a load rejection of ≥ 3669 kW. Two Notes modify the SR. Note 1 states that the Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Finally, credit may be taken for unplanned events that satisfy this SR. Note 2 states that if the Surveillance is performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. This changes the CTS requirement by specifying conditions for when the DGs are normally tested and by specifying a power factor of ≤ 0.9, if the testing is conducted by synchronizing with the offsite sources.

The addition of Note 1 is acceptable, because performance of the Surveillance for the DG could cause perturbations to the electrical distribution systems. Restricting normal performance of the Surveillance on the DG during MODES 1 and 2 minimizes challenges to continued steady state operation and, as a result, the unit's safety systems. However, if an assessment of the risks indicates plant safety is maintained or enhanced, the Surveillance can be performed to reestablish OPERABILITY. The addition of Note 2 is acceptable, because the testing should be conducted as close as possible to the conditions that would be experienced by a DG following an accident. Loading the DG solely with the inductive characteristics of a large motor will create a power factor less than unity. The design of the DG is set for full power operation with a power factor of ≥ 0.8. Therefore, testing of the DG for a loss of the single largest load and at full load is acceptable with a power factor ≤ 0.9. This change is designated as more restrictive because the testing required by the CTS does not currently contain these limitations.

M09 Unit 1 CTS 4.8.1.1.2.e.6 and Unit 2 CTS 4.8.1.1.2.e.7 require verification that each DG can operate for at least 24 hours within a specified load band. For the first two hours the Unit 1 load band is specified as 3800 kW to 3960 kW and 3800 kW to 3985 kW for Unit 2. ITS 3.8.1.13 specifies a two hour load band of 3800 kW to 3860 kW for Unit 1 DGs and 3800 kW to 3934 kW for the Unit 2 DGs. This changes the CTS by lowering the required upper load limit for the initial 2 hours of the DG 24 hour load run.

The purpose of Unit 1 CTS 4.8.1.1.2.e.6 and Unit 2 CTS 4.8.1.1.2.e.7 is to demonstrate that the DG can start and run continuously for not less than 24 hours at a full load capability with greater than or equal to 2 hours of the run at a load approximately equivalent to the 109% of the DG continuous rating for Unit 1 and approximately 104% of the DG continuous rating for Unit 2. The remainder of the run time is at a load equivalent to the continuous duty rating of the DG. The proposed change restricts the 2 hour band to a lower upper load band limit. The change is acceptable because the test loading is maintained consistent with the intent of RG 1.108 and within the 4 hour rating of the Unit 1 DGs and the 2000 hour rating of the Unit 2 DGs. This change is designated as more restrictive because it imposes a more restrictive load band on the DG test in lowering the upper band limit of the 2 hour load run. See DOC M11 for discussion of additional changes to the Unit 2 DG loading criteria.

M10 **Unit 2 only:** CTS 4.8.1.1.2.a.5, 4.8.1.1.2.e.7 and 4.8.1.1.2.e.13 specify a load band of 3450 kW to 3685 kW and CTS 4.8.1.1.2.e.3 specifies a generator load of 3685 kW for the full load rejection test. ITS SR 3.8.1.3, SR 3.8.1.13 and SR 3.8.1.20 specify bands of 3450 kW to 3669 kW, respectively. ITS SR 3.8.1.19 specifies a generator load of 3669 kW for the full load rejection test. This changes the CTS by changing the full load limit for testing of the Unit 2 DGs from 3685 kW to 3669 kW for the listed tests.

Analysis of the Unit 2 DGs identified the machines are engine limited (due to temperature limitations) at a continuous generator rating of 3669.4 kW and the DGs were derated. The change is acceptable because ITS retains testing of the DGs at the full load capability of the respective machine and is consistent with the RG 1.108 criteria. This change is designated more restrictive because it imposes a more restrictive load limit on the Unit 2 DGs.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.1.1.a requires two "physically independent" circuits between the offsite network and the onsite Class 1E AC Electrical Distribution System to be OPERABLE. CTS 3.8.1.1.b requires two "separate and independent" DG sets to be OPERABLE each with, in part, a separate fuel transfer pump. CTS 4.8.1.1.1 requires the determination of OPERABILITY for each "independent" circuit between the offsite transmission network and the onsite Class 1E AC Electrical Distribution System. In addition, a number of Surveillance Requirements in CTS have an **** footnote that states, “This test may be conducted in accordance with the manufacturer’s recommendations concerning engine prelube period.” ITS LCO 3.8.1 requires two qualified circuits between the offsite network and the onsite Class 1E AC Electrical Distribution System, two DGs capable of supplying the onsite Class 1E AC Electrical Distribution System. ITS SR 3.8.1.1 requires verification of the correct breaker alignment for each offsite circuit. The ITS SR Note regarding engine prelube for DG start Surveillances states, “All DG starts may be preceded by an engine prelube period.” This changes the CTS by moving the details that the offsite circuits are "independent" or "physically independent," that the DGs are "separate and independent" with a separate fuel transfer pump, and that engine prelube is conducted “in accordance with the manufacturer’s recommendations,” from the CTS to the ITS Bases.

The removal of these details related to system design from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement for OPERABLE offsite sources and DGs and Surveillance Requirements to periodically verify the AC sources are OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.1.1 Action f describes specific Required Actions with one Unit 1 (Unit 2) startup transformer inoperable and with a Unit 2 (Unit 1) startup transformer connected to the same A or B offsite power circuit but administratively available to both units. ITS does not include specific Required Actions for a plant configuration utilizing the other unit’s startup transformer. This changes the CTS by moving the description of the plant configuration that is acceptable for a qualified offsite circuit using the opposite unit’s startup transformer from the CTS to the ITS Bases.

CTS 3.8.1.1 Action f was implemented as part of Amendment No. 103, “St. Lucie Unit 1 – Issuance of Amendment Re: Diesel Generator Reliability (TAC No.

75505)," dated June 7, 1990 (ADAMS Accession No. ML013550091) and Amendment No. 39, "St. Lucie Unit 2 – Issuance of Amendment Re: Diesel Generator Reliability (TAC Nos. 59634 and 64190)," dated February 7, 1989 (ADAMS Accession No. ML013600246). As stated in the safety evaluation supporting the amendments, the NRC determined the change was acceptable.

The described configuration relies on a two-unit facility design that allows for alignment of one unit's startup transformer to satisfy one of the two qualified offsite circuits requirement of CTS 3.8.1.1 for the other unit. The opposite unit startup transformer may be available to both units provided it is not supplying power to its respective unit Class 1E Electrical Distribution System. The design allows this alternate alignment as an acceptable qualified offsite circuit for the operating unit.

The removal of this detail related to system design from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. This change is acceptable because the ITS continues to require two qualified circuits between the offsite transmission network to the onsite Class 1E Electrical Distribution System to be OPERABLE and the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications. See DOC L01 for additional discussion of changes to CTS 3.8.1.1 Action f.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Actions 3.8.1.1.b.2 and 3.8.1.1.c.2 include detail addressing the steam driven auxiliary feed pump as a required redundant feature. ITS Required Actions B.2 and C.2 do not include detail for specific redundant required features. This changes the CTS by moving the steam driven auxiliary feed pump detail from the CTS to the ITS Bases.

The removal of this detail related to system design from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA04 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Actions 3.8.1.1.b.3 and 3.8.1.1.c.3 require demonstration of the OPERABILITY of the OPERABLE DG by performance of Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours and clarifies the requirement by stating "If the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing." ITS Required Action B.3 does not include the clarifying detail. This changes the CTS by moving the clarifying detail from the CTS to the ITS Bases.

The removal of this detail related to system design from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA05 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 4.8.1.1.2.a.6 requires the verification that each DG is aligned to provide standby power to the associated emergency busses. ITS 3.8.1 does not contain this requirement. This changes the CTS by moving the detail that each DG is aligned to provide standby power to the associated emergency busses from the CTS to the ITS Bases.

The removal of these details that are related to system design from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement for OPERABLE DGs. An OPERABLE DG must be capable of providing power to the associated emergency busses as indicated in the Bases. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA06 *(Type 4 – Removal of LCO, SR, or other TS Requirement to the TRM, UFSAR, ODCM, NQAP, CLRT Program, IST Program, or ISI Program)* Unit 1 CTS 4.8.1.1.2.e.5.c and Unit 1 CTS 4.8.1.1.2.e.6.c require all automatic diesel generator trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a safety injection signal. ITS SR 3.8.1.12 requires a similar verification, but instead of specifying the DG automatic trips that are not bypassed, the Surveillance refers to the trips that are bypassed as "noncritical." This changes the CTS by moving the detail of the specific DG trips that are not bypassed to the UFSAR.

The removal of these details related to system design from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement to verify that the noncritical DG trips are bypassed on a loss of voltage signal concurrent with a safety injection signal. This change is acceptable because the UFSAR contains a complete listing of the DG electrical and mechanical trips and indicates the trips that are required whenever the DGs are required and the trips that are only required during the exercise mode of operation. In addition, PSL procedures periodically verify the capability of the DG trip relays and associated instrumentation to actuate a DG trip. The removed requirements will be adequately controlled in the UFSAR as any changes to the UFSAR are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA07 *(Type 4 – Removal of LCO, SR, or other TS Requirement to the TRM, UFSAR, ODCM, NQAP, CLRT Program, IST Program, or ISI Program)* CTS 4.8.1.1.2.g requires the performance of pressure tests of those portions of the diesel fuel oil system designed to USAS B31.7 Class 3 requirements in accordance with the Inservice Inspection Program. Performance of the requirement is in accordance with the Surveillance Frequency Control Program. ITS 3.8.1 does not include this requirement. This changes the CTS by moving this requirement for the diesel fuel oil system to the Inservice Inspection Program.

The removal of these details from the Technical Specifications is acceptable because this type of information is not necessary to provide adequate protection of public health and safety. Section XI of the ASME Boiler and Pressure Vessel Code contains the inservice inspection requirements addressed by this detail and the St. Lucie Inservice Inspection (ISI) Program implements the requirements. This change is acceptable because the removed information will be adequately controlled in the ISI Program. Any changes to the ISI Program are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information is being removed from the Technical Specifications.

LA08 *(Type 4 – Removal of LCO, SR, or other TS Requirement to the TRM, UFSAR, ODCM, NQAP, CLRT Program, IST Program, or ISI Program)* CTS 4.8.1.1.4 requires that the Class 1E underground cable system be demonstrated OPERABLE within 30 days after the movement of any load in excess of 80% of the ground surface design basis load over the cable ducts with the method of test specifically described in the Surveillance Requirement. ITS 3.8.1 does not include this Surveillance Requirement. This changes the CTS by moving this requirement for the underground cable system to the UFSAR.

The removal of these details from the Technical Specifications is acceptable because this type of information is not necessary to provide adequate protection of public health and safety. This change is acceptable because the removed information will be adequately controlled in the UFSAR. Any changes to the UFSAR are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.8.1.1 Actions b and c are modified by a NOTE requiring the completion of Surveillance Requirement 4.8.1.1.2.a.4 regardless of when the inoperable diesel generator is restored to operability if the absence of a common-cause failure cannot be confirmed. ITS 3.8.1 ACTION B requires a determination that the OPERABLE DG is not inoperable due to common cause failure through performance of SR 3.8.1.2 (CTS 4.8.1.1.2.a.4) unless it can be confirmed that the cause of the inoperable diesel generator does not exist on the OPERABLE diesel generator. However, ITS does not specify that the Required Action be completed if the Condition is exited. This changes the CTS by removing a requirement to complete the Surveillance Requirement once the ACTION is entered.

The purpose of CTS 3.8.1.1 Actions b and c is to provide compensatory measures to be taken in response to inoperable DG set(s), including demonstration that the OPERABLE DG is not inoperable due to a common cause. The Note requiring completion of the actions to verify the remaining DG is OPERABLE once the CTS Action is entered was added to the CTS with License Amendments 103 (Unit 1) and 39 (Unit 2) as part of the change to reflect the recommendations contained in Generic Letter 84-15. The requirement to complete the DG start test on the OPERABLE DG regardless of when the inoperable DG is restored to OPERABLE status was not included in ISTS 3.8.1 ACTION B. The requirement to complete the actions to demonstrate the OPERABLE DGs are not inoperable is not a required exception to ITS LCO 3.0.2 (CTS 3.0.2). Completing the ACTIONS to verify the OPERABILITY of the remaining OPERABLE DGs is not a required action to restore compliance with the LCO. Once a DG is restored to OPERABLE status, the need to start the OPERABLE DG if it cannot be determined the inoperable DG was not inoperable due to a common cause failure becomes unnecessary. Common cause failure evaluations are required by the PSL corrective action program pursuant to the requirements of 10 CFR 50, Appendix B. This change is acceptable because performance of a common cause failure evaluation is tracked in the plant's corrective action program, which if necessary, could require testing of the OPERABLE DG to confirm OPERABILITY. Additionally, deletion of the requirement to perform a start of the OPERABLE DG following restoration of the inoperable DG minimizes mechanical stress and wear on the OPERABLE DG engine and components. This change is designated as less restrictive, because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 (*Category 3 - Relaxation of Completion Time*) CTS 3.8.1.1 Action b.3 specifies the compensatory actions for one inoperable DG and CTS 3.8.1.1 Action c.3 specifies the compensatory actions for one inoperable offsite circuit and one inoperable DG. The Actions include a requirement to demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours. ITS 3.8.1 Required Action B.3.2 allows 24 hours to perform a similar check (ITS SR 3.8.1.2) on the remaining

OPERABLE DG. This changes the CTS by extending the time to perform this check from 8 hours to 24 hours.

The purpose of the CTS Action requirements to perform CTS 4.8.1.1.2.a.4 is to ensure that the other EDG is not inoperable because of a similar, yet undetected, failure (i.e., due to a common mode failure). The proposed 24 hour Completion time to start the OPERABLE DG is acceptable because it is considered a reasonable time to complete the DG start test on the other DG. Generic Letter 84-15 identified that a 24 hour time limit was acceptable to perform common mode failure checks or verify the DG start capability. In addition, the change is considered acceptable since the vast majority of DG start tests demonstrate that the DG is in fact OPERABLE. This change is designated as less restrictive because more time will be allowed to complete a Required Action in the ITS than is allowed in the CTS.

L03 *(Category 4 – Relaxation of Required Action)* CTS 3.8.1.1 Action f requires actions consistent with CTS 3.8.1.1 Action a except when the CTS 3.8.1.1.f actions are not met, the unit must be placed in COLD SHUTDOWN within the following 30 hours instead of HOT SHUTDOWN within the following 6 hours as required by CTS 3.8.1.1 Action a. ITS 3.8.1, ACTION G requires the unit to be placed in MODE 4 within 12 hours (i.e., HOT SHUTDOWN within 6 hours following HOT STANDBY in 6 hours) when the Required Actions and associated Completion Times of Condition A (i.e., one offsite circuit inoperable) are not met. This changes the CTS by changing the end state of CTS 3.8.1.1 Action f from "COLD SHUTDOWN within the following 30 hours" to "MODE 4 within 12 hours." (See DOC LA02 for discussion of removal of detail from CTS 3.8.1.1 Action f.)

The purpose of CTS 3.8.1.1 Actions a and f is to ensure that the remaining required AC source is OPERABLE when it is the only available offsite circuit to the affected unit and ensures that the inoperable startup transformer (offsite circuit) is restored to OPERABLE status within a reasonable time. CTS 3.8.1.1 Action f allows an opposite unit startup transformer to be used as an alternative AC source to support the qualified offsite circuit when the unit startup transformer is inoperable provided the opposite unit startup transformer is not supplying power to its own loads. If the opposite unit startup transformer is subsequently needed to supply its own loads, CTS 3.8.1.1 Action f duplicates Required Actions provided in CTS 3.8.1.1.a.1 and 3.8.1.1.a.3 and contrary to the Required Actions for one offsite circuit inoperable provided in Action a requires the unit to be in COLD SHUTDOWN within 36 hours if the Required Actions of CTS 3.8.1.1.f cannot be satisfied. This change is acceptable because the impact of not restoring the offsite circuit to Operable status is not changed based on the AC source (unit startup transformer or opposite unit startup transformer). The change to the end state from MODE 5 to MODE 4 is consistent with the Required Actions of CTS 3.8.1.1 Action a as revised in Amendments 234 and 184 (Units 1 and 2, respectively), "St. Lucie Plant, Unit Nos. 1 and 2 – Issuance of Amendments Regarding Changes in Selected Technical Specifications End States (CAC Nos. MF8106 and MF8107; Formerly CAC NOS. MF6683 AND MF6684)," dated August 30, 2016, (ADAMS Accession No. ML16210A374). In addition, the change of the end state from MODE 5 to MODE 4 is acceptable because the modification is consistent with CE-NPSD-1186-A, Revision 00, "Technical Justification for the Risk-Informed Modification to Selected Required Action End States for CEOG Member PWRs," dated October 2001 (ADAMS Accession No. 110410539). This change is designated as less restrictive because instead of requiring the plant to achieve MODE 5 (COLD SHUTDOWN), the ITS end state is MODE 4 (HOT SHUTDOWN) with LCO 3.0.4.a allowance not applicable.

L04 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.8.1.1.2.a.4 and CTS 4.8.1.1.2.f require verification that the DG starts from ambient condition and accelerates to approximately 900 rpm in less than or equal to 10 seconds. ITS SR 3.8.1.2, SR 3.8.1.7 and SR 3.8.1.18 require similar tests but do not include the specific criteria to accelerate to 900 rpm. In addition, the voltage and frequency criteria during the 10 second start is modified in CTS 4.8.1.1.2.a.4, CTS 4.8.1.1.2.e.4.a (Unit 1), and CTS 4.8.1.1.2.e.5.a (Unit 2). ITS SR 3.8.1.2 (DG slow start test) requires that each DG starts from standby conditions and achieves a steady state voltage of ≥ 3950 V and ≤ 4370 V and ≥ 59.4 Hz and ≤ 60.6 Hz. ITS SR 3.8.1.7 (DG quick start test), ITS SR 3.8.1.18, and ITS SR 3.8.1.20 (Unit 2), in part, requires the verification that each DG starts from standby conditions and achieves a voltage of ≥ 3950 V and frequency ≥ 59.4 Hz within 10 seconds and achieves a steady state voltage of ≥ 3950 V and ≤ 4370 V and ≥ 59.4 Hz and ≤ 60.6 Hz. ITS SR 3.8.1.11 (DG ESF actuation test), in part, requires the verification that each DG starts from standby conditions and achieves a voltage of ≥ 3950 V and frequency ≥ 59.4 Hz within 10 seconds and achieves a steady state voltage of ≥ 3950 V and ≤ 4370 V and ≥ 59.4 Hz and ≤ 60.6 Hz. This changes CTS 4.8.1.1.2.a.4 by removing the 900 rpm and the 10 seconds to achieve the steady state voltage and frequency range as addressed in ITS SR 3.8.1.2 criterion. It changes CTS 4.8.1.1.2.a.4, CTS 4.8.1.1.2.e.4.a (Unit 1), and CTS 4.8.1.1.2.e.5.a (Unit 2) by specifying a minimum voltage and frequency to be achieved within 10 seconds instead of requiring the voltage and frequency to be within range in 10 seconds. This effectively allows the upper voltage and frequency limits to be exceeded during DG acceleration and stabilization.

The purpose of the CTS 4.8.1.1.2.a.4, CTS 4.8.1.1.2.e.4.a (Unit 1), and CTS 4.8.1.1.2.e.5.a (Unit 2) is to test for the OPERABILITY of each DG to start and load on an ESF signal, respectively. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria (i.e., upper voltage and frequency limits) are not necessary for verification that the equipment used to meet the LCO can perform its required functions. This change includes narrowing the current voltage and frequency ranges consistent with the DG steady state voltage and frequency ranges specified in other CTS Surveillances (e.g., CTS 4.8.1.1.2.e.3.b (Unit 1) and CTS 4.8.1.1.2.e.4.b (Unit 2)). This changes the CTS by specifying a minimum voltage and frequency limit to be achieved within 10 seconds instead of a voltage and frequency range. This effectively allows the upper voltage and frequency limits to be exceeded during DG acceleration and stabilization. As stated herein, proposed SR 3.8.1.7, SR 3.8.11 and SR 3.8.18 will require only the establishment of the minimum frequency and voltage within the given time frame. The accident analyses and other Surveillances require that the DGs be capable of being loaded within 10 seconds. This can be accomplished at the lowest level in the frequency and voltage ranges. While the upper level requirement regarding the frequency and voltage acceptance criterion is being eliminated during the 10 second start, the requirement to establish a steady state voltage and frequency has been retained. Once steady state conditions are reached, the minimum and maximum voltage and frequency limits must be maintained. Verification that the minimum voltage and frequency limits are met within the proper time is sufficient to ensure the DG can perform its design function. When called upon, the DG must start and accept load within the proper time. Once the minimum voltage and frequency limits are met, the DG can connect to the bus. When a test is performed that does not result in connecting the DG to the bus, a voltage or frequency overshoot can occur since no loads are connected (the loading tends to minimize overshoot). This overshoot could be such that the voltage or frequency is outside the band high when the time limit expires. However, this condition is not indicative of an inoperable DG, provided that steady state voltage and frequency are maintained. The DG start times are monitored and trend evaluated to identify degradation of DG governor and voltage regulator performance as described in the ITS Bases. This change is designated as less restrictive because less stringent Surveillance test criteria are being applied in the ITS than were applied in the CTS.

L05 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.8.1.1.2.a.4 requires verification that each DG starts and achieves voltage and frequency within the specified limits. Additionally, the Surveillance requires the DG to be started for the test by using one of the following signals with startup on each signal verified in accordance with the Surveillance Frequency Control Program: manual/local, simulated loss-of-offsite power by itself, simulated loss-of-offsite power in conjunction with an ESF actuation signal, and an ESF actuation signal by itself. ITS SR 3.8.1.2 requires a similar test but does not include the requirement to vary the start signal between manual, loss of offsite power, simulated loss-of-offsite power in conjunction with an ESF actuation signal, and ESF actuation. This changes the CTS by deleting the requirement to use different start signals in the performance of the DG start Surveillance.

The purpose of CTS 4.8.1.1.2.a.4 is to verify the capability of each DG to start and achieve voltage and frequency with the specified limits. This change is acceptable because the deleted requirement is not necessary to verify that the equipment used to meet the LCO can perform its required functions. Equipment cannot discriminate between the origin of the start signal. Therefore, the results of the test are unaffected by the type of signal used to initiate the test. Each DG will continue to be tested in a manner to ensure the safety analyses assumption will be met. This change is designated as less restrictive because a Surveillance which is required in the CTS will not be required in the ITS.

L06 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS 4.8.1.1.2.a.5 requires verification that each DG is synchronized, loaded to greater than or equal to 3500 kW in accordance with manufacturer's recommendations and operates within a load band of 3300 to 3500 kW for at least an additional 60 minutes. Unit 2 CTS 4.8.1.1.2.a.5 requires verification that each DG is synchronized, loaded to greater than or equal to 3685 kW in accordance with manufacturer's recommendations and operates within a load band of 3450 to 3685 kW for at least an additional 60 minutes. ITS SR 3.8.1.3 requires a similar test but does not include the requirement to initially load the diesel generator to greater than or equal to 3500 kW (Unit 1) or 3685 kW (Unit 2). This changes the CTS by deleting the requirement to initially load the diesel generator to greater than or equal to 3500 kW (Unit 1) and 3685 kW (Unit 2). See DOC M11 for additional discussion of changes.

The purpose of CTS 4.8.1.1.2.a.5 (Unit 1 and Unit 2) is to verify the capability of each DG to synchronize to the offsite electrical system and accept loads greater than or equal to the equivalent of the maximum expected accident loads with a minimum run time to stabilize temperatures. This change is acceptable because the relaxed Surveillance Requirement acceptance criterion is not necessary to verify that the equipment used to meet the LCO can perform its required functions. This change is designated as less restrictive because a Surveillance test criterion, which is required in the CTS, will not be required in the ITS.

L07 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.8.1.1.2.b.1 requires the removal of accumulated water from the engine-mounted fuel tanks at least in accordance with the Surveillance Frequency Control Program and "after each occasion when the diesel is operated for greater than 1 hour." ITS SR 3.8.1.5 requires the same Surveillance but does not include requirement of after each occasion when the diesel is operated for greater than 1 hour. This changes the CTS by deleting the conditional requirement to test for accumulated water after each operation of the DG for greater than one hour.

The purpose of CTS 4.8.1.1.2.b.1 is to provide a degree of assurance that the engine-mounted fuel tanks are free of accumulated water each time the associated DG is operated for an hour or more.

This change is acceptable because the requirement to check for and remove accumulated water is retained in the ITS. Water condensation within the engine-mounted fuel tanks is a time dependent process, not a process dependent on the transfer of fuel oil during DG operation. Since it is the expectation that the DG will not be operated except for the nominal monthly OPERABILITY tests (based on experience), and that the fuel oil storage tanks are also periodically checked for water, no increased Frequency is necessary. This change is designated as less restrictive because the explicit requirement to remove accumulated water in the engine-mounted fuel tanks after a DG run of greater than one hour has been deleted.

L08 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.8.1.1.2.e.2 requires verification of the generator capability to reject a load greater than or equal to the specified value while maintaining voltage within ± 10 percent of the initial pretest voltage and frequency at 60 ± 1.2 Hz. ITS SR 3.8.1.9 requires verification that following load rejection, frequency is ≤ 66.7 Hz, and within 1.8 seconds following load rejection voltage is maintained ≥ 3950 V and ≤ 4370 V and frequency is maintained ≥ 59.4 Hz and ≤ 60.6 Hz. This changes the CTS in that the maximum frequency is relaxed to 66.7 Hz following load rejection and the time to reach the DG steady state frequency and voltage range is added. The voltage and frequency ranges are consistent with the DG steady state voltage and frequency ranges specified in other CTS Surveillances (e.g., CTS 4.8.1.1.2.e.3.b (Unit 1) and CTS 4.8.1.1.2.e.4.b (Unit 2)).

The purpose of CTS 4.8.1.1.2.e.2 is to ensure the proper operation of the DG governor and load control circuits. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria is not necessary for verification that the equipment used to meet the LCO can perform its required functions. These changes the CTS allow the transient frequency following load rejection and time to recover the voltage and frequency. Consistent with Regulatory Guide 1.9, the load rejection test is acceptable if the diesel speed does not exceed 75% of the difference between nominal speed and the overspeed trip setpoint, or 15% above nominal speed, whichever is lower. The overspeed trip of the PSL DGs is 1035 rpm, which is 115% of the DG synchronous speed. A frequency of 66.7 Hz equates to the synchronous speed plus 75% of the difference between synchronous speed and the overspeed trip setpoint (i.e., 1001.25 rpm). Consistent with Regulatory Guide 1.9, the time allowed to recover the voltage and frequency to within the nominal range is calculated based on 60% of the load sequence interval of the largest single load. The proposed timing of 1.8 seconds equates to 60% of the load sequence interval of the single largest load; 3 seconds. This change is acceptable since the DG continues to be tested consistent with the recommendations of Regulatory Guide 1.9. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L09 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS 4.8.1.1.2.e.5 and Unit 2 CTS 4.8.1.1.2.e.6 require verification of DG performance following an actual or simulated loss of offsite power in conjunction with an ESF actuation signal. ITS SR 3.8.1.12 and ITS SR 3.8.1.17 specify that the signal may be from either "actual or simulated" actuation signals. This changes the CTS by explicitly allowing the use of either an actual or simulated signal for the actuation signals and changes the specific actuation signal (i.e., safety injection) to ESF.

The purpose of Unit 1 CTS 4.8.1.1.2.e.5 and Unit 2 CTS 4.8.1.1.2.e.6 is to ensure that the AC Sources operate correctly upon receipt of an actuation signal. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Equipment cannot discriminate between an actual or simulated signal therefore the results of the testing are unaffected by the type of signal used to initiate the test. This change allows taking credit for unplanned actuation if sufficient information is collected to satisfy the Surveillance test requirements. The change also allows a simulated signal to be used, if necessary. In addition, ITS retains the specific ESF actuation signal (i.e., safety injection signal) information in the ITS Bases. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L10 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS 4.8.1.1.2.e.6 and Unit 2 CTS 4.8.1.1.2.e.7 requires verification that each DG can operate for at least 24 hours, with loading within the specified load bands.

The CTS further requires that voltage and frequency be 4160 ± 240 volts and 60 ± 1.2 Hz within 10 seconds after the start signal and steady state generator voltage and frequency shall be maintained within these limits during this test. ITS SR 3.8.1.13 requires similar tests however it does not specify voltage and frequency limits for the test. This changes the CTS by removing the voltage and frequency limits from the Surveillance.

The purpose of Unit 1 CTS 4.8.1.1.2.e.6 and Unit 2 CTS 4.8.1.1.2.e.7 is to verify the capability of each DG to start and run continuously at full load for at least 24 hours. DG operation with voltage and frequency within the specified limits will continue to be verified during performance of Unit 1 ITS SR 3.8.1.2, SR 3.8.1.7, SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.17, and SR 3.8.1.18; and Unit 2 ITS SR 3.8.1.2, SR 3.8.1.7, SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.11, SR 3.8.1.17, SR 3.8.1.18 and SR 3.8.1.20. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. The Surveillance will continue to verify that the DG is capable of running continuously at full load for an interval of not less than 24 hours. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L11 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.8.1.1.2.f requires verification that the DGs accelerate to 900 rpm within 10 seconds when started simultaneously in accordance with the Surveillance Frequency Control Program or after any modification which could affect DG interdependence. ITS SR 3.8.1.18 does not include the requirement to test simultaneous start of the DGs after any modifications which could affect DG interdependence. This changes the CTS by deleting the requirement to simultaneously start the DGs after any modifications which could affect DG interdependence.

This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the equipment used to meet the LCO is consistent with the safety analyses. Thus, appropriate equipment continues to be tested in a manner and at a Frequency necessary to give confidence that the assumptions in the safety analyses are protected. Following repair, maintenance, modification, or replacement of a component that may affect OPERABILITY, post maintenance testing is required to demonstrate OPERABILITY of the system or component. This is described in the Bases of ITS SR 3.0.1 and required under SR 3.0.1. The OPERABILITY requirements of the DGs are described in the Bases for Specification 3.8.1. In addition, the requirements of 10 CFR 50, Appendix B, Section XI (Test Control) provide adequate controls for test programs to ensure that testing incorporates applicable acceptance criteria. Compliance with 10 CFR 50 is required under the unit's operating license. As a result, post maintenance testing will continue to be performed and an explicit requirement in the Technical Specifications is not necessary. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS. Additional changes to CTS 4.8.1.1.2.f are discussed in DOC M07, DOC L04 and DOC L12.

L12 *(Category 8 – Deletion of Surveillance Requirement Shutdown Performance Requirements)* CTS 4.8.1.1.2.f contains the requirement to perform the test "during shutdown." ITS SR 3.8.1.18 does not specify conduct of the test to occur during shutdown. This changes the CTS by deleting the requirement to perform the Surveillance during shutdown.

The purpose of CTS 4.8.1.1.2.f is to demonstrate that diesel generator starting independence has not been compromised and that each engine can achieve proper speed within the specified time when the diesel generators are started simultaneously. The proposed Surveillance does not include the restriction that it be performed during shutdown. The control of unit conditions appropriate to perform the test is an issue for procedures and scheduling and has been determined by the NRC Staff to be unnecessary as a Technical Specification restriction. As indicated in Generic Letter 91-04, removal of this specific restriction is consistent with the vast majority of other Technical Specification Surveillances that do not dictate unit conditions for the Surveillance. This change is designated as less restrictive because the Surveillance may be performed during plant conditions other than shutdown. Additional changes to CTS 4.8.1.1.2.f are discussed in DOC M07, DOC L04 and DOC L11.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

3.8.1.1 LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

3.8.1.1.a a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System, and ①

3.8.1.1.b b. Two diesel generators (DGs) each capable of supplying one train of the onsite Class 1E AC Electrical Power Distribution System~~, and~~

~~[c. Automatic load sequencers for Train A and Train B~~. ~~]~~ ③

Applicability APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

---NOTE---

Action g LCO 3.0.4.b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Action a.1 A. One ~~[required]~~ offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for ~~[required]~~ OPERABLE offsite circuit.	1 hour AND Once per 8 hours thereafter ③
	AND	
Action a.2	A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND	

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action a.3		A.3 Restore ~~[required]~~ offsite circuit to OPERABLE status.	72 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	③
Action b.1	B. One ~~[required]~~ DG inoperable.	B.1 Perform SR 3.8.1.1 for the OPERABLE ~~[required]~~ offsite circuit(s).	1 hour AND Once per 8 hours thereafter	③
		AND		
Action b.2		B.2 Declare required feature(s) supported by the inoperable DG inoperable when its redundant required feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)	
		AND		
Action b.3 DOC L02		B.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.	~~[~~24~~]~~ hours	③
		OR		
Action b.3 DOC L02		B.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).	~~[~~24~~]~~ hours	
		AND		

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action b.4		B.4 Restore ~~[required]~~ DG to OPERABLE status.	14 days ~~72 hours~~ ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	④ ③
Action d.1	C. Two ~~[required]~~ offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)	③
		AND		
Action d.2		C.2 Restore one ~~[required]~~ offsite circuit to OPERABLE status.	24 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	③
Action c Action c NOTE 1	D. One ~~[required]~~ offsite circuit inoperable. AND One ~~[required]~~ DG inoperable.	--------------------NOTE------------------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition D is entered with no AC power source to any train. ---		③

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action c.4		D.1 Restore ~~[required]~~ offsite circuit~~s~~ to OPERABLE status.	12 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	3
		OR		
Action c.4		D.2 Restore ~~[required]~~ DG to OPERABLE status.	12 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	
Action e	E. Two ~~[required]~~ DGs inoperable.	E.1 Restore one ~~[required]~~ DG to OPERABLE status.	2 hours	3
	Insert 1 ~~F. ------------NOTE------------ This Condition may be deleted if the unit design is such that any sequencer failure mode will only affect the ability of the associated DG to power its respective safety loads following a loss of offsite power independent of, or coincident with, a Design Basis Event. -------------------------------~~ ~~[One [required] [automatic load sequencer] inoperable.~~	~~F.1 Restore [required] [automatic load sequencer] to OPERABLE status.~~	~~[12] hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~	5 2

CTS

Insert 1 ⑤

Action d.2

F. Required Action and associated Completion Time of Condition C not met.	F.1 Be in MODE 3.	6 hours

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ACTIONS (continued)

Action a.3
Action b.4
Action c.4
Action e
Action f

Action a.4
Action b.5
Action c.5
Action e

Action a.3
Action b.4
Action c.4
Action e
DOC L03

DOC M01

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action and associated Completion Time of Condition A, B, ~~C,~~ D, ~~E,~~ or ~~[F]~~ E not met.	G.1 Be in MODE 3.	6 hours
	AND	
	G.2 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. ------------------------------------- Be in MODE 4.	12 hours
H. Three or more ~~[required]~~ AC sources inoperable.	H. 1 Enter LCO 3.0.3.	Immediately

⑤ ③

③

SURVEILLANCE REQUIREMENTS

4.8.1.1.1.a

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each ~~[required]~~ offsite circuit.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~

③

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SURVEILLANCE REQUIREMENTS (continued)

CTS		SURVEILLANCE	FREQUENCY	
4.8.1.1.2.a.4 Footnote **	SR 3.8.1.2	-----------------------------NOTES---------------------------- 1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 2. ~~[~~A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.~~]~~ ---		③
4.8.1.1.2.a.4 DOC L04		Verify each DG starts from standby conditions and achieves steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	

SURVEILLANCE REQUIREMENTS (continued)

CTS		SURVEILLANCE	FREQUENCY
4.8.1.1.2.a.5 Footnote ** DOC A04 4.8.1.1.2.a.5 Footnote *** DOC M03 DOC M04	SR 3.8.1.3	-----NOTES----- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. -----	
4.8.1.1.2.a.5 DOC L06		Verify each DG is synchronized and loaded, and operates for ≥ 60 minutes at a load ≥ ~~[4500]~~ 3300 kW and ≤ ~~[5000]~~ 3500 kW.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ③
3.8.1.1.b.1 4.8.1.1.2.a.1	SR 3.8.1.4	Verify each day tank ~~[and engine mounted tank]~~ contains ≥ ~~[220]~~ 152 gal of fuel oil.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ③

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.2.b.1 DOC L07	SR 3.8.1.5	Check for and remove accumulated water from each day tank ~~[and engine mounted tank]~~.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③
4.8.1.1.2.a.3 DOC M02	SR 3.8.1.6	Verify the fuel oil transfer system operates to ~~[~~automatically~~]~~ transfer fuel oil from storage tank~~[~~s~~]~~ to the day tank s ~~[and engine mounted tank]~~.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ③
4.8.1.1.2.a.4 Footnote **	SR 3.8.1.7	------------------------------NOTE------------------------------ All DG starts may be preceded by an engine prelube period. ---		
4.8.1.1.2.a.4 DOC L04		Verify each DG starts from standby condition and achieves: a. In ≤ ~~[~~10~~]~~ seconds, voltage ≥ ~~[3740]~~ 3950 V and frequency ≥ ~~[58.8]~~ 59.4 Hz and b. Steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③

CTS

SURVEILLANCE REQUIREMENTS (continued)

4.8.1.1.1.b

SURVEILLANCE		FREQUENCY
SR 3.8.1.8	~~-----------------------------NOTE-----------------------------~~ ~~[This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.]~~ ~~--~~	
	~~[~~ Verify ~~[~~automatic ~~[~~and~~]~~ manual~~]~~ transfer of AC power sources from the normal ~~offsite~~ circuit to ~~each alternate [required]~~ the offsite circuit.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~

③ ①

CTS

SURVEILLANCE REQUIREMENTS (continued)

DOC M05

4.8.1.1.2.e.2 NOTE

DOC M05

4.8.1.1.2.e.2

DOC L08

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	------------------------------NOTES------------------------------ 1. ~~[~~This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ ~~[~~0.9~~]~~. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.~~]~~ --- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load and: a. Following load rejection, the frequency is ≤ ~~[63]~~ 66.7 Hz, b. Within ~~[3]~~ 1.8 seconds following load rejection, the voltage is ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and c. Within ~~[3]~~ 1.8 seconds following load rejection, the frequency is ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~

③

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
~~SR 3.8.1.10 -----------------------------NOTES---------------------------~~ ~~1. [This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.~~ ~~2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9]. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.]~~ ~~---~~ ~~Verify each DG does not trip, and voltage is maintained ≤ [5000] V during and following a load rejection of ≥ [4500] kW and ≤ [5000] kW.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~

⑥

CTS

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
4.8.1.1.2.e.3.b footnote **** 4.8.1.1.2.e.3 NOTE	SR 3.8.1.1~~1~~0	-----------------------------NOTES----------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, or 2~~, 3, or 4~~. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---		⑥ ⑦
4.8.1.1.2.e.3 4.8.1.1.2.e.3.a 4.8.1.1.2.e.3.b		Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, c. DG auto-starts from standby condition and: 1. Energizes permanently connected loads in ≤ ~~[~~10~~]~~ seconds, 2. Energizes auto-connected ~~shutdown~~ emergency loads through ~~[automatic~~ load sequence~~r]~~ timers, 3. Maintains steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, 4. Maintains steady state frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz, and 5. Supplies permanently connected ~~[~~and auto-connected~~]~~ ~~shutdown~~ emergency loads for ≥ 5 minutes.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	③ ① ①

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
	SR 3.8.1.1~~2~~ 1		⑥
4.8.1.1.2.e.4 Footnote ****	-----------------------------NOTES---------------------------- 1. ~~[~~ All DG starts may be preceded by an engine prelube period.		
4.8.1.1.2.e.4 NOTE	2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---		
4.8.1.1.2.e.4 DOC A07	Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and:	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]]~~	③
4.8.1.1.2.e.4.a DOC L04	a. In ≤ ~~[~~10~~]~~ seconds after auto-start and during tests, achieves voltage ≥ ~~[3740]~~ 3950 V and frequency ≥ ~~[58.8]~~ 59.4 Hz,		
4.8.1.1.2.e.4.c	b. Achieves steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz,		
4.8.1.1.2.e.4.b	c. Operates for ≥ 5 minutes,		
	d. Permanently connected loads remain energized from the offsite power system, and		
DOC M06	e. Emergency loads are energized ~~[~~or auto-connected through the ~~automatic~~ load sequence~~r]~~ timers from the offsite power system.		①

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.1~~3~~2	-----------------------------NOTE----------------------------- ~~[~~This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.~~]~~ --- 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].	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~

4.8.1.1.2.e.5
NOTE

4.8.1.1.2.e.5.c
DOC L09

⑥

③

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY

⑥

SR 3.8.1.14 3

4.8.1.1.2.e.6
Footnote #

-----------------------------NOTES----------------------------

1. Momentary transients outside the load and power factor ranges do not invalidate this test.

DOC M05

4.8.1.1.2.e.6
NOTE

①

2. ~~This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.~~ Credit may be taken for unplanned events that satisfy this SR.

DOC M05

③

3. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ ~~[~~0.9~~]~~. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

4.8.1.1.2.e.6

DOC M09

Verify each DG operates for ≥ 24 hours:

a. For ≥ ~~[~~2~~]~~ hours loaded ≥ ~~[5250]~~ 3800 kW and ≤ ~~[5500]~~ 3860 kW and

b. For the remaining hours of the test loaded ≥ ~~[4500]~~ 3300 kW and ≤ ~~[5000]~~ 3500 kW.

FREQUENCY:

~~[[18] months~~

~~OR~~

In accordance with the Surveillance Frequency Control Program~~]~~

③

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
~~SR 3.8.1.15 -----------------------------NOTES---------------------------~~ ~~1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ [2] hours loaded ≥ [4500] kW and ≤ [5000] kW.~~ ~~Momentary transients outside of load range do not invalidate this test.~~ ~~2. All DG starts may be preceded by an engine prelube period.~~ ~~---~~ ~~Verify each DG starts and achieves:~~ ~~a. In ≤ [10] seconds, voltage ≥ [3740] V and frequency ≥ [58.8] Hz and~~ ~~b. Steady state voltage ≥ [3740] V and ≤ [4580] V, and frequency ≥ [58.8] Hz and ≤ [61.2] Hz.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑧
SR 3.8.1.1~~6~~ 4 ⑧ 4.8.1.1.2.e.8 NOTE ------------------------------NOTE------------------------------ This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. --- 4.8.1.1.2.e.8 Verify each DG: 4.8.1.1.2.e.8.a a. Synchronizes with offsite power source while loaded with emergency loads upon ~~a~~ an actual or simulated restoration of offsite power, 4.8.1.1.2.e.8.b b. Transfers loads to offsite power source, and 4.8.1.1.2.e.8.c c. Returns to ready-to-load operation.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ① ③

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE	FREQUENCY	
4.8.1.1.2.e.9 NOTE	SR 3.8.1.1~~7~~ 5 ------------------------------NOTE------------------------------ ~~[~~This Surveillance shall not normally be performed in MODE 1~~,~~ or 2~~, 3, or 4~~. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. --		⑧ ⑦
4.8.1.1.2.e.9	Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation and ~~[~~b. Automatically energizing the emergency load from offsite power.~~]~~	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]]~~	③
4.8.1.1.2.e.11 NOTE	SR 3.8.1.1~~8~~ 6 ------------------------------NOTE------------------------------ ~~[~~This Surveillance shall not normally be performed in MODE 1~~,~~ or 2~~, 3, or 4~~. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.~~]~~ --		⑧ ⑦
4.8.1.1.2.e.11	Verify interval between each sequenced load block is within ± ~~[10%~~ 1 second of design interval~~]~~ for each ~~emergency [and shutdown]~~ load sequence~~r~~ timer.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	③ ② ①

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.2.e.5 Footnote **** 4.8.1.1.2.e.5 NOTE	SR 3.8.1.1~~9~~ 7	-----------------------------NOTES---------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1~~,~~ or 2~~, 3, or 4~~. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---		⑧ ⑦
4.8.1.1.2.e.5 DOC L09 4.8.1.1.2.e.5.a 4.8.1.1.2.e.5.a 4.8.1.1.2.e.5.b		Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ ~~[~~10~~]~~ seconds, 2. energizes auto-connected emergency loads through ~~[~~load sequence~~r]~~ timers, 3. achieves steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, 4. achieves steady state frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz, and 5. supplies permanently connected ~~[~~and auto-connected~~]~~ emergency loads for ≥ ~~[~~5~~]~~ minutes.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③ ②

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.2.f Footnote ****	SR 3.8.1.~~20~~ 18	------------------------------NOTE------------------------------ All DG starts may be preceded by an engine prelube period. ---		⑧
4.8.1.1.2.f DOC M07 DOC L04 DOC L11 DOC L12		Verify, when started simultaneously from standby condition, each DG achieves: a. In ≤ ~~[~~10~~]~~ seconds, voltage ≥ ~~[3740]~~ 3950 V and frequency ≥ ~~[58.8]~~ 59.4 Hz and b. Steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[10 years~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

3.8.1.1 LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

3.8.1.1.a a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System~~,~~ and ①

3.8.1.1.b b. Two diesel generators (DGs) each capable of supplying one train of the onsite Class 1E AC Electrical Power Distribution System~~, and~~

~~[c. Automatic load sequencers for Train A and Train B~~. ~~]~~ ③

Applicability APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

---NOTE---

Action g LCO 3.0.4.b is not applicable to DGs.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Action a.1	A. One ~~[required]~~ offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for ~~[required]~~ OPERABLE offsite circuit.	1 hour AND Once per 8 hours thereafter
		AND	
Action a.2		A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
		AND	

③

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action a.3		A.3 Restore ~~[required]~~ offsite circuit to OPERABLE status.	72 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	③
Action b.1	B. One ~~[required]~~ DG inoperable.	B.1 Perform SR 3.8.1.1 for the OPERABLE ~~[required]~~ offsite circuit(s).	1 hour AND Once per 8 hours thereafter	③
		AND		
Action b.2		B.2 Declare required feature(s) supported by the inoperable DG inoperable when its redundant required feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)	
		AND		
Action b.3 DOC L02		B.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.	~~[~~24~~]~~ hours	③
		OR		
Action b.3 DOC L02		B.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).	~~[~~24~~]~~ hours	
		AND		

ACTIONS (continued)

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action b.4		B.4 Restore ~~[required]~~ DG to OPERABLE status.	14 days ~~72 hours~~ ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	④ ③
Action d.1	C. Two ~~[required]~~ offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)	③
		AND		
Action d.2		C.2 Restore one ~~[required]~~ offsite circuit to OPERABLE status.	24 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	③
Action c Action c NOTE 1	D. One ~~[required]~~ offsite circuit inoperable. AND One ~~[required]~~ DG inoperable.	--------------------NOTE------------------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition D is entered with no AC power source to any train. ---		③

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action c.4		D.1 Restore ~~[required]~~ offsite circuit~~s~~ to OPERABLE status.	12 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	③
		OR		
Action c.4		D.2 Restore ~~[required]~~ DG to OPERABLE status.	12 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	
Action e	E. Two ~~[required]~~ DGs inoperable.	E.1 Restore one ~~[required]~~ DG to OPERABLE status.	2 hours	③
	Insert 1 ~~F. ------------NOTE------------~~ ~~This Condition may be deleted if the unit design is such that any sequencer failure mode will only affect the ability of the associated DG to power its respective safety loads following a loss of offsite power independent of, or coincident with, a Design Basis Event.~~ ~~-------------------------------~~ ~~[One [required] [automatic load sequencer] inoperable.~~	~~F.1 Restore [required] [automatic load sequencer] to OPERABLE status.~~	~~[12] hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~	⑤ ②

CTS

Insert 1 ⑤

Action d.2

F. Required Action and associated Completion Time of Condition C not met.	F.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action a.3 Action b.4 Action c.4 Action e Action f Action a.4 Action b.5 Action c.5 Action e Action a.3 Action b.4 Action c.4 Action e DOC L03	G. Required Action and associated Completion Time of Condition A, B, ~~C,~~ D, ~~E,~~ or ~~[F]~~ E not met.	G.1 Be in MODE 3. AND G.2 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. -------------------------------------- Be in MODE 4.	6 hours 12 hours	⑤ ③
DOC M01	H. Three or more ~~[required]~~ AC sources inoperable.	H. 1 Enter LCO 3.0.3.	Immediately	③

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE	FREQUENCY	
4.8.1.1.1.a	SR 3.8.1.1 Verify correct breaker alignment and indicated power availability for each ~~[required]~~ offsite circuit.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	③

CTS

SURVEILLANCE REQUIREMENTS (continued)

4.8.1.1.2.a.4
Footnote **

4.8.1.1.2.a.4
DOC L04

SURVEILLANCE		FREQUENCY
SR 3.8.1.2	-----------------------------NOTES----------------------------- 1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 2. ~~[~~A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.~~]~~ ---	
	Verify each DG starts from standby conditions and achieves steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~

③

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY
4.8.1.1.2.a.5 DOC A04 4.8.1.1.2.a.5 Footnote *** DOC M03 DOC M04	SR 3.8.1.3	-----------------------------NOTES---------------------------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. ---	
4.8.1.1.2.a.5 DOC L06 DOC M10		Verify each DG is synchronized and loaded, and operates for ≥ 60 minutes at a load ≥ ~~[4500]~~ 3450 kW and ≤ ~~[5000]~~ 3669 kW.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ ③
3.8.1.1.b.1 4.8.1.1.2.a.1	SR 3.8.1.4	Verify each day tank ~~[and engine mounted tank]~~ contains ≥ ~~[220]~~ 238 gal of fuel oil.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ ③

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.2.b.1 DOC L07	SR 3.8.1.5	Check for and remove accumulated water from each day tank ~~[and engine mounted tank]~~.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③
4.8.1.1.2.a.3 DOC M02	SR 3.8.1.6	Verify the fuel oil transfer system operates to ~~[~~automatically~~]~~ transfer fuel oil from storage tank~~[~~s~~]~~ to the day tank s ~~[and engine mounted tank]~~.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ③
4.8.1.1.2.a.4 Footnote **	SR 3.8.1.7	-----------------------------NOTE----------------------------- All DG starts may be preceded by an engine prelube period. ---		
4.8.1.1.2.a.4 DOC L04		Verify each DG starts from standby condition and achieves: a. In ≤ ~~[~~10~~]~~ seconds, voltage ≥ ~~[3740]~~ 3950 V and frequency ≥ ~~[58.8]~~ 59.4 Hz and b. Steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.8	~~-----------------------------NOTE-----------------------------~~ ~~[This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.]~~ ~~--~~	
	~~[~~ Verify ~~[~~automatic ~~[~~and~~]~~ manual~~]~~ transfer of AC power sources from the normal ~~offsite~~ circuit to ~~each alternate [required]~~ the offsite circuit.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~

4.8.1.1.1.b

③ ①

CTS

SURVEILLANCE REQUIREMENTS (continued)

DOC M05

4.8.1.1.2.e.2
NOTE

DOC M05

4.8.1.1.2.e.2

DOC L08

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	-----------------------------NOTES---------------------------- 1. ~~[~~This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ ~~[~~0.9~~]~~. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.~~]~~ --- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load and: a. Following load rejection, the frequency is ≤ ~~[63]~~ 66.7 Hz, b. Within ~~[3]~~ 1.8 seconds following load rejection, the voltage is ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and c. Within ~~[3]~~ 1.8 seconds following load rejection, the frequency is ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~

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CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
	SR 3.8.1.1~~0~~ 9	---NOTES--- 1. ~~[~~This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.		⑥
DOC M08 4.8.1.1.2.e.3 NOTE			~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	③
DOC M08		2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ ~~[~~0.9~~]~~. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.~~]~~ ---		
4.8.1.1.2.e.3 DOC M10		Verify each DG does not trip, and voltage is maintained ≤ 4784 ~~[5000]~~ V during and following a load rejection of ≥ 3669 ~~[4500] kW and ≤ [5000]~~ kW.		

Move SR to after ITS SR 3.8.1.18

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE	FREQUENCY	
4.8.1.1.2.e.4 Footnote **** 4.8.1.1.2.e.4 NOTE	SR 3.8.1.1~~1~~ 0 -----------------------------NOTES---------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, or 2~~, 3, or 4~~. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---		⑥ ⑦
4.8.1.1.2.e.4 4.8.1.1.2.e.4.a 4.8.1.1.2.e.4.b	Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, c. DG auto-starts from standby condition and: 1. Energizes permanently connected loads in ≤ ~~[~~10~~]~~ seconds, 2. Energizes auto-connected ~~shutdown~~ emergency loads through ~~[automatic~~ load sequence~~r]~~ timers, 3. Maintains steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, 4. Maintains steady state frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz, and 5. Supplies permanently connected ~~[~~and auto-connected~~]~~ ~~shutdown~~ emergency loads for ≥ 5 minutes.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	③ ① ①

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE	FREQUENCY
4.8.1.1.2.e.5 Footnote ****	SR 3.8.1.1~~2~~ 1 -----------------------------NOTES----------------------------- 1. ~~[~~ All DG starts may be preceded by an engine prelube period.	
4.8.1.1.2.e.5 NOTE	2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---	
4.8.1.1.2.e.5 DOC A07	Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and:	~~[[18] months~~ ~~OR~~
4.8.1.1.2.e.5.a DOC L04	a. In ≤ ~~[~~10~~]~~ seconds after auto-start and during tests, achieves voltage ≥ ~~[3740]~~ 3950 V and frequency ≥ ~~[58.8]~~ 59.4 Hz,	In accordance with the Surveillance Frequency Control Program ~~]]~~
4.8.1.1.2.e.5.c	b. Achieves steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz,	
4.8.1.1.2.e.5.b	c. Operates for ≥ 5 minutes,	
	d. Permanently connected loads remain energized from the offsite power system, and	
DOC M06	e. Emergency loads are energized ~~[~~or auto-connected through the ~~automatic~~ load sequence~~r]~~ timers from the offsite power system.	

⑥

③

①

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
4.8.1.1.2.e.6 NOTE	SR 3.8.1.1~~3~~ 2	------------------------------NOTE----------------------------- ~~[~~This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.~~]~~ ---		⑥
4.8.1.1.2.e.6.c DOC L09		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~~]~~.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	③

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
4.8.1.1.2.e.7 Footnote #	SR 3.8.1.1~~4~~ 3 -----------------------------NOTES---------------------------- 1. Momentary transients outside the load and power factor ranges do not invalidate this test.		⑥
DOC M05 4.8.1.1.2.e.7 NOTE	2. ~~This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.~~ Credit may be taken for unplanned events that satisfy this SR.		①
DOC M05	3. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ ~~[~~0.9~~]~~. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. ---		③
4.8.1.1.2.e.7 DOC M09 DOC M10	Verify each DG operates for ≥ 24 hours: a. For ≥ ~~[~~2~~]~~ hours loaded ≥ ~~[5250]~~ 3800 kW and ≤ ~~[5500]~~ 3934 kW and b. For the remaining hours of the test loaded ≥ ~~[4500]~~ 3450 kW and ≤ ~~[5000]~~ 3669 kW.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③

CTS

SURVEILLANCE REQUIREMENTS (continued)

Move SR to after ITS SR 3.8.1.19

		SURVEILLANCE	FREQUENCY	
4.8.1.1.2.e.13 DOC A10 DOC M10 4.8.1.1.2.e.13 Footnote #	SR 3.8.1.~~15~~ 20	-----------------------------NOTES---------------------------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ~~≥ [2] hours~~ loaded ≥ ~~[4500]~~ 3450 kW and ≤ ~~[5000]~~ 3669 kW~~.~~ for ≥ 2 hours or until operating temperatures have stabilized. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. ---		⑧ ①
4.8.1.1.2.e.13		Verify each DG starts and achieves: a. In ≤ ~~[~~10~~]~~ seconds, voltage ≥ ~~[3740]~~ 3950 V and frequency ≥ ~~[58.8]~~ 59.4 Hz and b. Steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	③
4.8.1.1.2.e.9 NOTE	SR 3.8.1.1~~6~~ 4	-----------------------------NOTE----------------------------- This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---		⑧
4.8.1.1.2.e.9 4.8.1.1.2.e.9.a 4.8.1.1.2.e.9.b 4.8.1.1.2.e.9.c		Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon ~~a~~ an actual or simulated restoration of offsite power, b. Transfers loads to offsite power source, and c. Returns to ready-to-load operation.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	① ③

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
4.8.1.1.2.e.10 NOTE 4.8.1.1.2.e.10	SR 3.8.1.1~~7~~ 5 ------------------------------NOTE----------------------------- ~~[~~This Surveillance shall not normally be performed in MODE 1, or 2~~, 3, or 4~~. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. --- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation and ~~[~~b. Automatically energizing the emergency load from offsite power.~~]~~	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]]~~	⑧ ⑦ ③
4.8.1.1.2.e.12 NOTE 4.8.1.1.2.e.12	SR 3.8.1.1~~8~~ 6 ------------------------------NOTE----------------------------- ~~[~~This Surveillance shall not normally be performed in MODE 1, or 2~~, 3, or 4~~. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.~~]~~ --- Verify interval between each sequenced load block is within ± 1 second ~~[10%~~ of design interval] for each ~~emergency [and shutdown]~~ load sequence~~r~~ timer.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	⑧ ⑦ ③ ② ①

CTS

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY
4.8.1.1.2.e.6 Footnote ****	SR 3.8.1.1~~9~~7	------------------------------NOTES---------------------------- 1. All DG starts may be preceded by an engine prelube period.	⑧
4.8.1.1.2.e.6 NOTE		2. This Surveillance shall not normally be performed in MODE 1, or 2~~, 3, or 4~~. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---	⑦
4.8.1.1.2.e.6 DOC L09		Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal:	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.8.1.1.2.e.6.a		a. De-energization of emergency buses,	
4.8.1.1.2.e.6.a		b. Load shedding from emergency buses,	
4.8.1.1.2.e.6.b		c. DG auto-starts from standby condition and:	
		1. energizes permanently connected loads in ≤ ~~[~~10~~]~~ seconds,	
		2. energizes auto-connected emergency loads through ~~[~~load sequence~~r]~~ timers,	③ ②
		3. achieves steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V,	
		4. achieves steady state frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz, and	
		5. supplies permanently connected ~~[~~and auto-connected~~]~~ emergency loads for ≥ ~~[~~5~~]~~ minutes.	

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.2.f Footnote ****	SR 3.8.1.~~20~~ 18	------------------------------NOTE------------------------------ All DG starts may be preceded by an engine prelube period. ---		⑧
4.8.1.1.2.f DOC M07 DOC L04 DOC L11 DOC L12		Verify, when started simultaneously from standby condition, each DG achieves: a. In ≤ ~~[~~10~~]~~ seconds, voltage ≥ ~~[3740]~~ 3950 V and frequency ≥ ~~[58.8]~~ 59.4 Hz and b. Steady state voltage ≥ ~~[3740]~~ 3950 V and ≤ ~~[4580]~~ 4370 V, and frequency ≥ ~~[58.8]~~ 59.4 Hz and ≤ ~~[61.2]~~ 60.6 Hz.	~~[10 years~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.1, AC SOURCES - OPERATING

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. ISTS LCO 3.8.1.c and ISTS 3.8.1 ACTION F have been deleted since St. Lucie Plant (PSL) Units 1 and 2 do not use automatic load sequencers. Each load or load block is sequenced by the use of its associated time delay relay (i.e., load sequence timers). Each major ESF component has an individual time delay relay that operates individual components, instead of an electronic load sequencer that sequences the required ESF components on a bus. Thus, if a single time delay relay fails, only the affected component and the DG are impacted. ISTS SR 3.8.1.11 (ITS SR 3.8.1.10), ISTS SR 3.8.1.12 (ITS SR 3.8.1.11), ISTS SR 3.8.1.18 (ITS SR 3.8.1.16), and ISTS SR 3.8.1.19 (ITS SR 3.8.1.17) have been revised to reflect the use of load sequence timers.

3. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

4. Changes made to reflect the current licensing basis approved in PSL Unit 1 License Amendment 170 and PSL Unit 2 License Amendment 115.

5. ITS 3.8.1 ACTION F has been added to reflect CTS 3.8.1.1 Action d.2. ITS 3.8.1 Condition F applies when the Required Action and associated Completion Time of Condition C is not met with a Required Action to be in MODE 3 and a Completion Time of 6 hours. When two offsite circuits are inoperable, the original PSL Unit 1 and Unit 2 Technical Specifications only require the unit to be placed in Hot Standby (MODE 3) within 6 hours when one of two offsite circuits cannot be restored to OPERABLE status within 24 hours.

   When both offsite circuits are inoperable, the DGs are supplying power to the loads necessary to maintain the reactor shutdown. This change is acceptable because remaining in MODE 3 allows operators to focus on restoration of at least one offsite circuit to OPERABLE status instead of shifting their attention to a plant cooldown. In MODE 3, the steam generators continue to be available for steaming to maintain RCS parameters and steam generator makeup can be provided by the turbine driven auxiliary feedwater pump. This can minimize DG loading while attempts are made to restore offsite power. If one or more offsite circuits remains inoperable for > 72 hours while in MODE 3, the actions of Condition A (one offsite circuit inoperable) would not be met and Condition H would apply. Required Action H.2 will further require action to place the unit in MODE 4. Voluntary entry into MODE 4 or 5 is not restricted as these MODES are also acceptable low risk states. Concomitant changes are made to ISTS 3.8.1, Condition G.

6. ISTS SR 3.8.1.10 is not included in the Unit 1 PSL ITS. This SR is not included in the Unit 1 PSL current licensing basis and has not been retained in ITS. ISTS SR 3.8.1.10 requires verification that each DG will not trip and will maintain voltage within a maximum limit on a full load rejection test. A full load rejection test is not required by the CTS requirements. ITS retains the CTS requirement to

perform the largest post-accident load rejection test (SR 3.8.1.9). This change is acceptable because the DG output breaker current trip is greater than the current trip of the individual load breakers. Therefore, on a system fault, the breaker of the individual loads will trip before the DG output breaker trips. Tripping of the DG output breaker with all loads connected is the most likely way to cause a 100% load rejection. Therefore, testing of the largest post-accident load rejection is sufficient to ensure DG reliability. To maintain consistency between Unit 1 and Unit 2 SRs, ISTS SR 3.8.1.10 has been renumbered as SR 3.8.1.19 in the Unit 2 ITS. Subsequent ISTS Surveillances have been renumbered in the Unit 1 and Unit 2 ITS, as applicable.

7. ISTS SR 3.8.1.11, ISTS SR 3.8.1.17, ISTS SR 3.8.1.18 and ISTS SR 3.8.1.19 include a NOTE modifying the respective surveillance stating that the Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. These ISTS SRs are changed to state that the Surveillance shall not normally be performed in MODE 1 or 2, as approved in Unit 1 License Amendment 250 and Unit 2 License Amendment 202.

8. ISTS SR 3.8.1.15 is not included in the Unit 1 PSL ITS. ISTS SR 3.8.1.15 requires the hot fast re-start of each DG to rated voltage and frequency after operating for at least 2 hours. This test is normally associated with the requirement to perform a 24-hour run to establish the required “hot” conditions. ISTS SR 3.8.1.15 has not been included in the Unit 1 ITS since it is not consistent with current licensing basis and testing practices for the DGs. ISTS SR 3.8.1.15 tests a design feature (the hot restart capability of the DG) that is not credited in the PSL accident analysis. No postulated design basis event results in the need to restart the DG following a shutdown from hot conditions and the potential consequences of failure of DG to restart from hot condition are bounded by the potential consequences that would result from an immediate failure of the DG itself. Since the accident analysis assumes no operator actions associated with the Emergency Core Cooling System take place in the first 10 minutes following an accident, verification of this design feature does not materially contribute to the demonstration of DG OPERABILITY. To maintain consistency between Unit 1 and Unit 2 SRs, ISTS SR 3.8.1.15 has been renumbered as SR 3.8.1.20 in the Unit 2 ITS. Subsequent ISTS Surveillances have been renumbered in the Unit 1 and Unit 2 ITS, as applicable.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources - Operating

BASES

BACKGROUND

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

The onsite Class 1E AC Distribution System is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to two preferred offsite power sources and a single DG.

Offsite power is supplied to the unit switchyard(s) from the transmission network by four ~~[two]~~ transmission lines. From the switchyard(s), two electrically and physically separated circuits provide AC power, through ~~[~~step down startup ~~station auxiliary~~ transformers~~]~~, to the 4.16 kV ESF buses. Insert 1 A detailed description of the offsite power network and the circuits to the Class 1E ESF buses is found in the U FSAR, Chapter ~~[~~8~~]~~ (Ref. 2). ② ①

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF bus or buses.

Insert 2 ~~Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the transformer supplying offsite power to the onsite Class 1E Distribution System. Within [1 minute] after the initiating signal is received, all automatic and permanently connected loads needed to recover the unit or maintain it in a safe condition are returned to service via the load sequencer~~. ① ③

The onsite standby power source for each 4.16 kV ESF bus is a dedicated DG. DGs ~~[~~1A ~~1]~~ and ~~[~~1B ~~2]~~ are dedicated to ESF buses 1A3 ~~[11]~~ and 1B3 ~~[12]~~, respectively. A DG starts automatically on a safety injection actuation signal (SIAS) ~~signal~~ (i.e., low-low pressurizer pressure or high containment pressure signals) or on an ~~[~~ESF 4.16kV bus degraded voltage or undervoltage signal~~]~~. ② ① After the DG has started, it will automatically tie to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or

①

Insert 1

The circuit between each startup transformer and the associated 4.16 kV ESF bus includes two non-ESF buses: 2A4 and 1A2 buses for Train A; and 2B4 and 1B2 buses for Train B. Alternately, AC power can be supplied from a Unit 2 startup transformer; 2A or 2B via the non-ESF buses, by manually aligning the opposite unit startup transformer (i.e., removing and installing the startup transformer feeder breaker in a different breaker cubicle) to the unit 4.16 kV ESF bus.

①

Insert 2

Normal power for the onsite Class 1E AC Distribution System is supplied through the unit auxiliary transformers. If the normal onsite power source is lost to the onsite Class 1E AC Electrical Distribution System (i.e., main generator trip) an automatic fast transfer is initiated to transfer the 4.16 kV ESF buses from the unit auxiliary transformers to the startup transformers (offsite power). The transfer occurs in approximately three cycles.

BASES

BACKGROUND (continued)

degraded voltage, independent of or coincident with an AS SI signal. The DGs will also start and operate in the standby mode without tying to the ESF bus on an AS SI signal alone. Following the trip of offsite power, all ~~[a sequencer/an undervoltage signal] strips~~ nonpermanent loads are tripped from the ESF bus. When the DG is tied to the ESF bus, loads are then sequentially connected to its respective ESF bus~~by the automatic load sequencer~~. ~~The sequencing logic controls the permissive and starting signals to motor breakers~~ The starting of subsequent loads (in load blocks) is delayed by timing relays with 3 second intervals between them to prevent overloading the DG by automatic load application. ① ② ① ③

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

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within ~~[~~1~~]~~ minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service. ②

Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 3500 ~~[7000]~~ kW with ~~[10]% overload permissible for up to 2 hours in any 24 hour period~~ 3860 kW permissible for 4 hours. The ESF loads that are powered from the 4.16 kV ESF buses are listed in Reference 2. ②

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 4) and Chapter ~~[~~15~~]~~ (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems. ① ②

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This results in maintaining at least one train of the onsite or offsite AC sources OPERABLE during accident conditions in the event of:

APPLICABLE SAFETY ANALYSES (continued)

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

b. A worst case single failure.

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

LCO

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

Qualified offsite circuits are those that are described in the U FSAR and are part of the licensing basis for the unit. ①

~~[In addition, one required automatic load sequencer per train must be OPERABLE.]~~ ②

Each qualified offsite circuit must be physically independent, capable of providing three phases of AC power, maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the ESF buses. ①

Insert 3

~~[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. Offsite circuit #2 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.]~~ ②

Each DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This will be accomplished within ~~[~~10~~]~~ seconds. Each DG must also 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 with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillances, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode. ② ⑤

Insert 3 ①

Each offsite circuit consists of a unit startup transformer (i.e., 1A, 1B) and the associated circuit path, including non-ESF buses (i.e., 2A4 and 1A2 buses; 2B4 and 1B2 buses), up to and including the feeder breaker to the respective unit 4.16 kV ESF bus (i.e., 1A3 bus, 1B3 bus). Alternately, when one unit startup transformer is unavailable, the associated offsite circuit may consist of an opposite unit startup transformer (i.e., 2A or 2B) and the associated circuit path, including non-ESF buses, up to and including the feeder breaker to the respective unit 4.16 kV ESF bus.

LCO (continued)

Proper sequencing of loads, ~~[~~including tripping of nonessential loads,~~]~~ is a required function for DG OPERABILITY. ②

The AC sources in one train must be separate and independent (to the extent possible) of the AC sources in the other train. For the DGs, separation and independence are complete.

For the offsite AC sources, separation and independence are to the extent practical. ~~A circuit may be connected to more than one ESF bus, with fast transfer capability to the other circuit OPERABLE, and not violate separation criteria.~~ A circuit that is not connected to an ESF bus is required to have OPERABLE fast transfer interlock mechanisms to at least ~~two~~ one ESF bus~~es~~ to support OPERABILITY of that circuit. Insert 4 ①

APPLICABILITY

The AC sources ~~[and sequencers]~~ are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that: ③ ②

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

<u>A.1</u>

To ensure a highly reliable power source remains with the one offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1

①

Insert 4

Each startup transformer set (1A-2A, 1B-2B) is provided with a manual switching arrangement that permits powering the associated Class 1E electrical distribution subsystem from either unit's startup transformer. A single startup transformer is adequate to accommodate the emergency and auxiliary loads of a unit during a postulated DBA. Therefore, when utilized as a qualified offsite AC source to Unit 1, the Unit 2 startup transformer may be aligned to ESF buses of both units and not violate the criterion for shared systems between units provided the Unit 2 startup transformer is not supplying power to a Unit 2 bus.

BASES

ACTIONS (continued)

acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition C, for two offsite circuits inoperable, is entered.

~~-----REVIEWER'S NOTE-----~~
~~The turbine driven auxiliary feedwater pump is only required to be considered a redundant required feature, and, therefore, required to be determined OPERABLE by this Required Action, if the design is such that the remaining OPERABLE motor or turbine driven auxiliary feedwater pump(s) is not by itself capable (without any reliance on the motor driven auxiliary feedwater pump powered by the emergency bus associated with the inoperable diesel generator) of providing 100% of the auxiliary feedwater flow assumed in the safety analysis.~~
~~-----~~

④

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power train. This includes motor and steam driven auxiliary feedwater pumps~~. Single train systems, such as turbine driven auxiliary feedwater pumps, may not be included~~. The steam driven auxiliary feedwater pump is only considered a redundant required feature in MODES 1, 2, and 3 because it is not required to be OPERABLE in MODE 4.

①

The Completion Time for Required Action A.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. The train has no offsite power supplying its loads and

b. A required feature on the other train is inoperable.

If at any time during the existence of Condition A (one offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

BASES

ACTIONS (continued)

Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with the other train that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System. ②

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.1

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

BASES

ACTIONS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The turbine driven auxiliary feedwater pump is only required to be considered a redundant required feature, and, therefore, required to be determined OPERABLE by this Required Action, if the design is such that the remaining OPERABLE motor or turbine driven auxiliary feedwater pump(s) is not by itself capable (without any reliance on the motor driven auxiliary feedwater pump powered by the emergency bus associated with the inoperable diesel generator) of providing 100% of the auxiliary feedwater flow assumed in the safety analysis.~~
~~--~~

④

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor and steam driven auxiliary feedwater pumps~~. Single train systems, such as turbine driven auxiliary feedwater pumps, are not included~~. The steam driven auxiliary feedwater pump is only considered a redundant required feature in MODES 1, 2, and 3 because it is not required to be OPERABLE in MODE 4. Redundant required feature failures consist of inoperable features with a train, redundant to the train that has an inoperable DG.

①

The Completion Time for Required Action B.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable DG exists and

b. A required feature on the other train is inoperable.

If at any time during the existence of this Condition (one DG inoperable) a required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

BASES

ACTIONS (continued)

Discovering one required DG inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with the OPERABLE DG, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently, is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this Condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

<u>B.3.1 and B.3.2</u>

Required Action B.3.1 provides an allowance to avoid unnecessary testing of OPERABLE DGs. If it can be determined that the cause of the inoperable DG does not exist on the OPERABLE DG, SR 3.8.1.2 does not have to be performed. For example: if the DG inoperability is due to an inoperable support system, an independently testable component, preplanned preventative maintenance or testing. If the cause of inoperability exists on the other ①
DG~~(s)~~, the other DG~~(s)~~ would be declared inoperable upon discovery and Condition E of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists and Required Action B.3.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG~~(s)~~, performance of SR 3.8.1.2 suffices to ①
provide assurance of continued OPERABILITY of that DG.

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the ~~[~~plant corrective action program~~]~~ will ②
continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. ~~7~~ 9), ~~[~~24~~]~~ hours is reasonable to ① ②
confirm that the OPERABLE DG~~(s)~~ is not affected by the same problem as the inoperable DG.

BASES

ACTIONS (continued)

B.4

Insert 5

~~According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours.~~ ①

14 day

In Condition B, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The ~~72 hour~~ Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. ① ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ②

C.1 and C.2

and steam

The steam driven auxiliary feedwater pump is only considered a redundant required feature in MODES 1, 2, and 3 because it is not required to be OPERABLE in MODE 4.

Required Action C.1, which applies when two offsite circuits are inoperable, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for this failure of redundant required features is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are powered from redundant AC safety trains. This includes motor driven auxiliary feedwater pumps. ~~Single train features, such as turbine driven auxiliary pumps, are not included in the list.~~ ①

The Completion Time for Required Action C.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. All required offsite circuits are inoperable and

b. A required feature is inoperable.

Insert 5 ①

The 14-day Completion Time is based on the findings of a deterministic and probabilistic safety analysis. The risk impact of the Completion Time has been evaluated pursuant to the risk assessment and management provisions of the Maintenance Rule, 10 CFR 50.65(a)(4), and the associated implementation guidance, Regulatory Guide 1.160. Per NRC Letter, “St. Lucie Unit 1 – Issuance of Amendment Regarding Diesel Generator Allowed Outage Time Extension (TAC No. MA7205),” dated January 19, 2001, (Ref. 7) operation may continue in Condition B for a period of 14 days provided compensatory measures are taken.

BASES

ACTIONS (continued)

If at any time during the existence of Condition C (two offsite circuits inoperable) and a required feature becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition C for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure and

b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ②

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

ACTIONS (continued)

D.1 and D.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable resulting in de-energization. Therefore, the Required Actions of Condition D are modified by a Note to indicate that when Condition D is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems - Operating," must be immediately entered. This allows Condition D to provide requirements for the loss of one offsite circuit and one DG without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition D for a period that should not exceed 12 hours. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ②

In Condition D, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition C (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ②

E.1

With Train A and Train B DGs inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, insufficient standby AC sources are available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for this level of degradation, the risk associated with continued operation for a short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued

BASES

ACTIONS (continued)

operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Regulatory Guide 1.93 (Ref. 6), with both DGs inoperable, operation may continue for a period that should not exceed 2 hours.

Insert 6

~~[F.1~~

1

~~The sequencer(s) is an essential support system to [both the offsite circuit and the DG associated with a given ESF bus]. [Furthermore, the sequencer is on the primary success path for most major AC electrically powered safety systems powered from the associated ESF bus.] Therefore, loss of an [ESF bus sequencer] affects every major ESF system in the [division]. The [12] hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining sequencer OPERABILITY. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.] This time period also ensures that the probability of an accident (requiring sequencer OPERABILITY) occurring during periods when the sequencer is inoperable is minimal.~~

2

~~This Condition is preceded by a Note that allows the Condition to be deleted if the unit design is such that any sequencer failure mode will only affect the ability of the associated DG to power its respective safety loads under any conditions. Implicit in this Note is the concept that the Condition must be retained if any sequencer failure mode results in the inability to start all or part of the safety loads when required, regardless of power availability, or results in overloading the offsite power circuit to a safety bus during an event, thereby causing its failure. Also implicit in the Note, is that the Condition is not applicable to any train that does not have a sequencer.]~~

G.1 and G.2

~~-------------------------------REVIEWER'S NOTE--------------------------------~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

4

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

①

Insert 6

If a Required Action of Condition C cannot be performed within its associated Completion Time, the unit must be brought to a MODE in which plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours.

When both offsite circuits are inoperable, the DGs are supplying power to the loads necessary to maintain the reactor shutdown. Remaining in MODE 3 allows operators to focus on restoration of at least one offsite circuit to OPERABLE status instead of shifting their attention to a plant cooldown. In MODE 3, the steam generators continue to be available for steaming to maintain RCS parameters and steam generator makeup can be provided by the turbine driven auxiliary feedwater pump. This can minimize DG loading while attempts are made to restore offsite power. If one or more offsite circuits remains inoperable for > 72 hours while in MODE 3, the actions of Condition A would not be met and Condition H would apply. Required Action H.2 will further require action to place the unit in MODE 4. However, voluntary entry into MODE 4 or 5 may be made as these MODES are also acceptable low risk states.

The allowed Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, “Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422),” Westinghouse, May 2010.~~ ④

~~---~~

If a Required Action of Conditions A, B, D, or E cannot be performed with its associated Completion Time, ~~If the inoperable AC electrical power sources cannot be restored to OPERABLE status within the required Completion Time,~~ the unit must be brought to a MODE in which plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. ①

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. ~~7~~ 8). In MODE 5, it is likely that increased plant maintenance activities (particularly those involving the switchyard) will make the plant more susceptible to loss of offsite power events. In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state. ①

Required Action G.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

H.1

Condition H corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. ~~9~~ 10). ①

Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 1~~0~~ 1), and Regulatory Guide 1.137 (Ref. 1~~1~~ 2), as addressed in the U FSAR. ①

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of Insert 7 ~~[3740] V is 90% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1-1982 (Ref. 12), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 80% of name plate rating. The specified maximum steady state output voltage of [4756] V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).~~ ② ①

SR 3.8.1.1

This SR ensures correct breaker alignment for each ~~[required]~~ offsite circuit to ensure that distribution buses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. The SR also verifies the indicated availability of three-phase AC electrical power from each ~~[required]~~ offsite circuit to the ②

Insert 7 ①

3950 V is 95% of the nominal 4160 V output voltage. This value, which is conservative with respect to the value specified in ANSI C84.1-1989 (Ref. 13), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level. The minimum steady state output voltage ensures the operating system voltage for the 480 V switchgear is ≥ 90% of nominal bus voltage, which bounds the 90% criterion of the safety related motor voltage ratings. The specified maximum steady state output voltage of 4370 V bounds the maximum operating bus voltage. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is such that continuous operation of motor loads does not result in a failure of the load due to overheating. The specified minimum and maximum frequencies of the DG are 59.4 Hz and 60.6 Hz, respectively. These values are equal to ± 1% of the 60 Hz nominal frequency and are conservative with respect to the recommendations given in Regulatory Guide 1.9 (Ref. 3). The under frequency limit considers reduced pump flow and discharge pressure and reduced motor operated valve stroke times during accident sequences. The over frequency limit considers net positive suction head of safety related pumps, increased differential pressure across closed valves, and increased DG fuel oil and lube oil consumption.

BASES

SURVEILLANCE REQUIREMENTS (continued)

onsite distribution network. ~~[The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room~~. ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

SR 3.8.1.2 and SR 3.8.1.7

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs are modified by a Note (Note 1 for SR 3.8.1.2 and Note for SR 3.8.1.7) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading ~~by an engine prelube period~~. ①

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGs are started from standby conditions. Standby conditions for a DG mean the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

~~[~~ In order to reduce stress and wear on diesel engines, the DG manufacturer~~s~~ recommend s a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. This is the intent of SR 3.8.1.2 Note 2, which is only applicable when such modified start procedures are recommended by the manufacturer.

SR 3.8.1.7 requires that the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the U FSAR, Chapter 6 (Ref. 4) and Chapter ~~[~~15~~]~~ (Ref. 5). ~~]~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 2) when a modified start procedure as described above is used. If a modified start is not used, 10 second start requirement of SR 3.8.1.7 applies.

Since SR 3.8.1.7 requires a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2.

In addition to the SR requirements, the time for the DG to reach steady state operation, unless the modified DG start method is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

~~[The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 8). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between [0.8 lagging] and [1.0]. The 0.8 value is the design rating of the machine, while [1.0] is an operational limitation [to ensure circulating currents are minimized]. ~~[The 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 3).~~ 5 5 ②

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---~~ ~~]~~ ②

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

SR 3.8.1.4

engine mounted day tanks (one tank per engine)

This SR provides verification that the level of fuel oil in the ~~day tank [and engine mounted tank]~~ is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons, and is selected to ensure adequate fuel oil ~~for a minimum of 1 hour of DG operation at full load plus 10%~~. ② ①

to operate the engine at rated capacity for a sufficient duration to allow maintenance or valve realignment

~~[The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.~~ ②

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---~~] ②

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day ~~[and engine mounted]~~ tanks eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~[The Surveillance Frequency of 31 days is established by Regulatory Guide 1.137 (Ref. 11). This SR is for preventive maintenance.~~ ②

~~OR~~ ②

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---~~] ②

The presence of water does not necessarily represent failure of this SR provided the accumulated water is removed during the performance of this Surveillance.

SR 3.8.1.6

the fuel oil storage system

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from ~~its associated storage tank~~ to its associated day tank s. This is required to support continuous operation of ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil transfer system piping ~~system~~ is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE. ①

~~[[The Frequency for this SR is variable, depending on individual system design, with up to a [92] day interval. The [92] day Frequency corresponds to the testing requirements for pumps as contained in the ASME Code (Ref. 13); however, the design of fuel transfer systems is such that pumps will operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day [and engine mounted] tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate. Since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY, the Frequency of this SR should be modified to reflect individual designs.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]]~~ ②

SR 3.8.1.7

See SR 3.8.1.2.

~~[~~ SR 3.8.1.8

Transfer of each ~~[~~4.16 kV ESF bus~~]~~ power supply from the normal ~~offsite~~ circuit , (i.e., unit auxiliary transformer) to the ~~alternate~~ offsite circuit demonstrates the OPERABILITY of the offsite ~~alternate~~ circuit distribution network to power the shutdown loads. ~~[The [18 month] Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ ① ②

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~---------------------------------REVIEWER'S NOTE---------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--~~~~]~~ ②

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

<u>SR 3.8.1.9</u>

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. ~~[~~For this unit, the single load for each DG and its horsepower rating is ~~as follows:]~~ an intake cooling water pump with a nameplate rating of 600 hp. This Surveillance may be accomplished by: ②

SURVEILLANCE REQUIREMENTS (continued)

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

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

As required by IEEE-308 (Ref. 14), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 1.8 ~~[3]~~ seconds specified is equal to 60% of a 3 ~~typical 5~~ second load sequence interval associated with sequencing of the largest load. ① The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the DG ~~system~~ must recover following load rejection. ① ~~[The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 10).~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns)

BASES

SURVEILLANCE REQUIREMENTS (continued)

provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ ~~[~~0.9~~]~~. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 2 allows the Surveillance to be conducted at a power factor other than ≤ ~~[~~0.9~~]~~. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ ~~[~~0.9~~]~~ results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to ~~[~~0.9~~]~~ while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of ~~[~~0.9~~]~~ may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to ~~[~~0.9~~]~~ without exceeding the DG excitation limits. ②

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~

~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable~~:

~~a. Performance of the SR will not render any safety system or component inoperable,~~

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

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

~~--~~ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.8.1.10~~

~~This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG will not trip upon loss of the load. These acceptance criteria provide DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.~~ ①

~~[The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 10) and is intended to be consistent with expected fuel cycle lengths.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~ ②

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

~~This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system~~ ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ [0.9]. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 2 allows the Surveillance to be conducted at a power factor other than ≤ [0.9]. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ [0.9] results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to [0.9] while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of [0.9] may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to [0.9] without exceeding the DG excitation limits.~~ ①

~~-----------------------------REVIEWER'S NOTE-----------------------------~~

~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:~~

~~a. Performance of the SR will not render any safety system or component inoperable,~~

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

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

~~--~~ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.1~~1~~0 ⑥

As required by Regulatory Guide 1.108 (Ref. 1~~0~~1), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time. ①

The DG auto-start time of ~~[~~10~~]~~ seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved. ②

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

~~[The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~ ②

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

~~[~~SR 3.8.1.1~~2~~1 ② ⑥

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (~~[~~10~~]~~ seconds) from the ~~design basis~~ ESF actuation signal ~~(LOCA signal)~~ and ② ① operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.1~~2~~1.d and SR 3.8.1.1~~2~~1.e ensure that ⑥ permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~[The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.8.1.1~~3~~2 ⑥

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation ~~test~~ signal. Noncritical automatic trips are all automatic trips except: ①

a. Engine overspeed; and ①

b. Generator differential current~~;~~

~~[c. Low lube oil pressure;~~

~~d. High crankcase pressure; and~~

~~e. Start failure relay.]~~ ②

The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

~~[The [18 month] Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:~~

~~a. Performance of the SR will not render any safety system or component inoperable,~~ ④

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~c. Performance of the SR or failure of the SR will not cause or result in an AOO with attendant challenge to plant safety systems.~~ ④

~~---~~

3

SR 3.8.1.14 ⑥

1

the 2 hour rating (i.e.,

Regulatory Guide 1.108 (Ref. 1~~0~~), paragraph 2.a.(3), requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ~~≥ [~~2~~]~~ hours of which is at a load equivalent to 110% of the continuous duty rating) and the remainder of the time at a load equivalent to the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR. ① ②

This SR meets the intent of this requirement to the extent practical by loading the DG to approximately 109% of the generator continuous duty rating not to exceed the 4 hour rating. This loading requirement challenges the full loading capability of the DG without unnecessarily overloading the DG.

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. ①

~~[The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 8), paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~ ②

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test. ~~The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.~~ ②

Note 2 provides an allowance that c~~C~~redit may be taken for unplanned events that satisfy this SR. Note 3 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ ~~[~~0.9~~]~~. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 3 allows the Surveillance to be conducted at a power factor other than ≤ ~~[~~0.9~~]~~. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ ~~[~~0.9~~]~~ results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to ~~[~~0.9~~]~~ while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of ~~[~~0.9~~]~~ may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close practicable to ~~[~~0.9~~]~~ without exceeding the DG excitation limits. ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.8.1.15~~

~~This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within [10] seconds. The [10] second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. [The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(5).~~

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

~~This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least [2] hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.~~ ② ④

4

SR 3.8.1.1~~6~~ ⑥

1

As required by Regulatory Guide 1.108 (Ref. 1~~0~~), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and that the DG can be returned to ready to load status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the DG to reload if a ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an~~d~~ autoclose signal on bus undervoltage, and the load sequence timers are reset. ⑤

~~[The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(6), and takes into consideration unit conditions required to perform the Surveillance.~~ ②

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE--------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[~~SR 3.8.1.1~~7~~ 5 ⑥ ②

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a ~~LOCA~~ ① safety injection actuation signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 14), paragraph 6.2.6(2).

The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.1~~2~~ 1. The intent in the requirement associated with SR 3.8.1.1~~7~~ 5.b is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified. ⑥

~~[The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(8); takes into consideration unit conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing

SURVEILLANCE REQUIREMENTS (continued)

following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR. ~~]~~ ②

SR 3.8.1.1~~8~~6 ⑥

Under accident ~~[~~and loss of offsite power~~]~~ conditions loads are sequentially connected to the bus by the ~~[~~automatic load sequence~~r]~~ timers. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The ~~[10]%~~ ±1 second load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. ~~Reference 1 provides a summary of the automatic loading of ESF buses.~~ ③ ①

~~[The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(2); takes into consideration unit conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.~~

~~OR~~ ②

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ④ ②

SURVEILLANCE REQUIREMENTS (continued)

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~

~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:~~

~~a. Performance of the SR will not render any safety system or component inoperable,~~

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

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

~~--~~ ④

SR 3.8.1.1~~9~~ 7 ⑥

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

0 This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.1~~1~~, during a loss of offsite power actuation ~~test~~ signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified. ⑥ ①

~~[The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of [18 months].~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they

BASES

SURVEILLANCE REQUIREMENTS (continued)

are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.~~20~~ 18 ⑥

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

~~[The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10).~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated, and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Chapter ~~[~~8~~]~~. ①
3. Regulatory Guide 1.9, Rev. ~~[3]~~ 0. ②
4. UFSAR, Chapter ~~[~~6~~]~~. ①

BASES

REFERENCES (continued)

7. NRC Letter, “St. Lucie Unit 1 – Issuance of Amendment Regarding Diesel Generator Allowed Outage Time Extension (TAC No. MA7205),” dated January 19, 2001 (ML010250042). ① ②

5. U FSAR, Chapter ~~[~~15~~]~~.

6. Regulatory Guide 1.93, Rev. ~~[~~ 1 ~~], [date]~~.

8 ~~7~~. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

9 ~~8~~. Generic Letter 84-15.

10 ~~9~~. 10 CFR 50, Appendix A, GDC 18.

11 ~~10~~. Regulatory Guide 1.108, Rev. ~~[~~1~~], [August 1977]~~. ① ②

12 ~~11~~. Regulatory Guide 1.137, Rev. ~~[~~ 1 ~~], [date]~~.

13 ~~12~~. ANSI C84.1-198~~2~~9.

~~13~~. ~~ASME Code for Operation and Maintenance of Nuclear Power Plants.~~

14. IEEE Standard 308-~~[~~197~~8]~~0. ②

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources - Operating

BASES

BACKGROUND

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

The onsite Class 1E AC Distribution System is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to two preferred offsite power sources and a single DG.

Offsite power is supplied to the unit switchyard(s) from the transmission network by four ~~[two]~~ transmission lines. From the switchyard(s), two electrically and physically separated circuits provide AC power, through ~~[~~step down startup ~~station auxiliary~~ transformers~~]~~, to the 4.16 kV ESF buses. Insert 1 A detailed description of the offsite power network and the circuits to the Class 1E ESF buses is found in the U FSAR, Chapter ~~[~~8~~]~~ (Ref. 2). ② ①

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF bus or buses.

Insert 2

~~Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the transformer supplying offsite power to the onsite Class 1E Distribution System. Within [1 minute] after the initiating signal is received, all automatic and permanently connected loads needed to recover the unit or maintain it in a safe condition are returned to service via the load sequencer.~~ ① ③ ①

The onsite standby power source 2B for each 4.16 kV ESF bus is a dedicated DG. DGs 2A ~~[11]~~ and ~~[12]~~ are dedicated to ESF buses 2A3 ~~[11]~~ and 2B3 ~~[12]~~, respectively. A DG starts automatically on a safety injection actuation signal (SIAS) ~~signal~~ (i.e., low -low pressurizer pressure or high containment pressure signals) or on an ~~[~~ESF 4.16kV bus degraded voltage or undervoltage signal~~]~~. ② ① After the DG has started, it will automatically tie to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or

①

Insert 1

The circuit between each startup transformer and the associated 4.16 kV ESF bus includes two non-ESF buses: 2A4 and 2A2 buses for Train A; and 2B4 and 2B2 buses for Train B. Alternately, AC power can be supplied from a Unit 1 startup transformer, 1A or 1B via the non-ESF buses, by manually aligning the opposite unit startup transformer (i.e., removing and installing the startup transformer feeder breaker in a different breaker cubicle) to the unit 4.16 kV ESF bus.

①

Insert 2

Normal power for the onsite Class 1E AC Distribution System is supplied through the unit auxiliary transformers. If the normal onsite power source is lost to the onsite Class 1E AC Electrical Distribution System (i.e., main generator trip) an automatic fast transfer is initiated to transfer the 4.16 kV ESF buses from the unit auxiliary transformers to the startup transformers (offsite power). The transfer occurs in approximately three cycles.

BACKGROUND (continued)

degraded voltage, independent of or coincident with an AS SI signal. The DGs will also start and operate in the standby mode without tying to the ESF bus on an AS SI signal alone. Following the trip of offsite power, ~~[a~~ all ~~sequencer/an undervoltage signal] strips~~ nonpermanent loads are tripped from the ESF bus. When the DG is tied to the ESF bus, loads are then sequentially connected to its respective ESF bus ~~by the automatic load sequencer~~. ~~The sequencing logic controls the permissive and starting signals to motor breakers~~ The starting of subsequent loads (in load blocks) is delayed by timing relays with 3 second intervals between them to prevent overloading the DG by automatic load application. ① ② ① ③

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

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within ~~[~~1~~]~~ minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service. ②

Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is ~~[7000]~~ 3669 kW with ~~[10]% overload permissible for up to 2 hours in any 24 hour period~~ 3934 kW permissible for 2000 hours. The ESF loads that are powered from the 4.16 kV ESF buses are listed in Reference 2. ②

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 4) and Chapter ~~[~~15~~]~~ (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems. ① ②

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This results in maintaining at least one train of the onsite or offsite AC sources OPERABLE during accident conditions in the event of:

BASES

APPLICABLE SAFETY ANALYSES (continued)

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

b. A worst case single failure.

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

LCO

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

U

Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the unit. ①

~~[In addition, one required automatic load sequencer per train must be OPERABLE.]~~ ②

qualified physically independent, ①

Each 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 ESF buses.

Insert 3

~~[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. Offsite circuit #2 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.]~~ ②

Each DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This will be accomplished within ~~[~~10~~]~~ seconds. Each DG ② must also be capable of accepting required loads within the assumed loading sequence intervals~~,~~ and continue to operate until offsite power ⑤ 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 with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillances, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode.

Insert 3 ①

Each offsite circuit consists of a unit startup transformer (i.e., 2A, 2B) and the associated circuit path, including non-ESF buses (i.e., 2A4 and 2A2 buses; 2B4 and 2B2 buses), up to and including the feeder breaker to the respective unit 4.16 kV ESF bus (i.e., 2A3 bus, 2B3 bus). Alternately, when one unit startup transformer is unavailable, the associated offsite circuit may consist of an opposite unit startup transformer (i.e., 1A or 1B) and the associated circuit path, including non-ESF buses, up to and including the feeder breaker to the respective unit 4.16 kV ESF bus.

LCO (continued)

Proper sequencing of loads, ~~[~~including tripping of nonessential loads,~~]~~ is a required function for DG OPERABILITY. ②

The AC sources in one train must be separate and independent (to the extent possible) of the AC sources in the other train. For the DGs, separation and independence are complete.

For the offsite AC sources, separation and independence are to the extent practical. ~~A circuit may be connected to more than one ESF bus, with fast transfer capability to the other circuit OPERABLE, and not violate separation criteria.~~ A circuit that is not connected to an ESF bus is required to have OPERABLE fast transfer interlock mechanisms to at least ~~two~~ one ESF bus~~es~~ to support OPERABILITY of that circuit. Insert 4 ①

APPLICABILITY

The AC sources ~~[and sequencers]~~ are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that: ③ ②

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with the one offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1

①

Insert 4

Each startup transformer set (1A-2A, 1B-2B) is provided with a manual switching arrangement that permits powering the associated Class 1E electrical distribution subsystem from either unit's startup transformer. A single startup transformer is adequate to accommodate the emergency and auxiliary loads of a unit during a postulated DBA. Therefore, when utilized as a qualified offsite AC source to Unit 2, the Unit 1 startup transformer may be aligned to ESF buses of both units and not violate the shared system criterion between units provided the Unit 1 startup transformer is not supplying power to a Unit 1 bus.

BASES

ACTIONS (continued)

acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition C, for two offsite circuits inoperable, is entered.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The turbine driven auxiliary feedwater pump is only required to be considered a redundant required feature, and, therefore, required to be determined OPERABLE by this Required Action, if the design is such that the remaining OPERABLE motor or turbine driven auxiliary feedwater pump(s) is not by itself capable (without any reliance on the motor driven auxiliary feedwater pump powered by the emergency bus associated with the inoperable diesel generator) of providing 100% of the auxiliary feedwater flow assumed in the safety analysis.~~
~~--~~

④

A.2

and steam

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power train. This includes motor driven auxiliary feedwater pumps~~. Single train systems, such as turbine driven auxiliary feedwater pumps, may not be included~~.

The steam driven auxiliary feedwater pump is only considered a redundant required feature in MODES 1, 2, and 3 because it is not required to be OPERABLE in MODE 4.

①

The Completion Time for Required Action A.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. The train has no offsite power supplying its loads and

b. A required feature on the other train is inoperable.

If at any time during the existence of Condition A (one offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

BASES

ACTIONS (continued)

Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with the other train that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System. ②

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.1

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

BASES

ACTIONS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The turbine driven auxiliary feedwater pump is only required to be considered a redundant required feature, and, therefore, required to be determined OPERABLE by this Required Action, if the design is such that the remaining OPERABLE motor or turbine driven auxiliary feedwater pump(s) is not by itself capable (without any reliance on the motor driven auxiliary feedwater pump powered by the emergency bus associated with the inoperable diesel generator) of providing 100% of the auxiliary feedwater flow assumed in the safety analysis.~~
~~--~~ ④

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor and steam driven auxiliary feedwater pumps~~. Single train systems, such as turbine driven auxiliary feedwater pumps, are not included~~. The steam driven auxiliary feedwater pump is only considered a redundant required feature in MODES 1, 2, and 3 because it is not required to be OPERABLE in MODE 4. Redundant required feature failures consist of inoperable features with a train, redundant to the train that has an inoperable DG. ①

The Completion Time for Required Action B.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable DG exists and

b. A required feature on the other train is inoperable.

If at any time during the existence of this Condition (one DG inoperable) a required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

BASES

ACTIONS (continued)

Discovering one required DG inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with the OPERABLE DG, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently, is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this Condition, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.3.1 and B.3.2

Required Action B.3.1 provides an allowance to avoid unnecessary testing of OPERABLE DGs. If it can be determined that the cause of the inoperable DG does not exist on the OPERABLE DG, SR 3.8.1.2 does not have to be performed. For example: if the DG inoperability is due to an inoperable support system, an independently testable component, preplanned preventative maintenance or testing. If the cause of inoperability exists on the other DG~~(s)~~, the other DG~~(s)~~ would be declared inoperable upon discovery and ① Condition E of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists and Required Action B.3.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG~~(s)~~, performance of SR 3.8.1.2 suffices to ① provide assurance of continued OPERABILITY of that DG.

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the ~~[~~plant corrective action program~~]~~ will ② continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. ~~7~~ 9), ~~[~~24~~]~~ hours is reasonable to ① ② confirm that the OPERABLE DG~~(s)~~ is not affected by the same problem as the inoperable DG.

ACTIONS (continued)

B.4

Insert 5

~~According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours.~~ ①

14 day

In Condition B, the remaining OPERABLE DG and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The ~~72 hour~~ Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ① ②

C.1 and C.2

and steam

Required Action C.1, which applies when two offsite circuits are inoperable, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for this failure of redundant required features is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are powered from redundant AC safety trains. This includes motor driven auxiliary feedwater pumps. ~~Single train features, such as turbine driven auxiliary pumps, are not included in the list.~~ ①

The steam driven auxiliary feedwater pump is only considered a redundant required feature in MODES 1, 2, and 3 because it is not required to be OPERABLE in MODE 4.

The Completion Time for Required Action C.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. All required offsite circuits are inoperable and

b. A required feature is inoperable.

Insert 5 ①

The 14-day Completion Time is based on the findings of a deterministic and probabilistic safety analysis. The risk impact of the Completion Time has been evaluated pursuant to the risk assessment and management provisions of the Maintenance Rule, 10 CFR 50.65(a)(4), and the associated implementation guidance, Regulatory Guide 1.160. Per NRC Letter, “St. Lucie Unit No. 2 – Issuance of Amendment Regarding Diesel Generator Allowed Outage Time Extension (TAC No. MA7206),” dated April 26, 2001, (Ref. 7) operation may continue in Condition B for a period of 14 days provided compensatory measures are taken.

BASES

ACTIONS (continued)

If at any time during the existence of Condition C (two offsite circuits inoperable) and a required feature becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition C for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure and

b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ②

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

BASES

ACTIONS (continued)

D.1 and D.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable resulting in de-energization. Therefore, the Required Actions of Condition D are modified by a Note to indicate that when Condition D is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems - Operating," must be immediately entered. This allows Condition D to provide requirements for the loss of one offsite circuit and one DG without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition D for a period that should not exceed 12 hours. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ②

In Condition D, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition C (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ ②

E.1

With Train A and Train B DGs inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, insufficient standby AC sources are available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for this level of degradation, the risk associated with continued operation for a short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued

BASES

ACTIONS (continued)

operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Regulatory Guide 1.93 (Ref. 6), with both DGs inoperable, operation may continue for a period that should not exceed 2 hours.

Insert 6

~~[F.1~~

① ②

~~The sequencer(s) is an essential support system to [both the offsite circuit and the DG associated with a given ESF bus]. [Furthermore, the sequencer is on the primary success path for most major AC electrically powered safety systems powered from the associated ESF bus.] Therefore, loss of an [ESF bus sequencer] affects every major ESF system in the [division]. The [12] hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining sequencer OPERABILITY. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.] This time period also ensures that the probability of an accident (requiring sequencer OPERABILITY) occurring during periods when the sequencer is inoperable is minimal.~~

~~This Condition is preceded by a Note that allows the Condition to be deleted if the unit design is such that any sequencer failure mode will only affect the ability of the associated DG to power its respective safety loads under any conditions. Implicit in this Note is the concept that the Condition must be retained if any sequencer failure mode results in the inability to start all or part of the safety loads when required, regardless of power availability, or results in overloading the offsite power circuit to a safety bus during an event, thereby causing its failure. Also implicit in the Note, is that the Condition is not applicable to any train that does not have a sequencer.]~~

G.1 and G.2

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~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

Insert 6 ①

If a Required Action of Condition C cannot be performed within its associated Completion Time, the unit must be brought to a MODE in which plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours.

When both offsite circuits are inoperable, the DGs are supplying power to the loads necessary to maintain the reactor shutdown. Remaining in MODE 3 allows operators to focus on restoration of at least one offsite circuit to OPERABLE status instead of shifting their attention to a plant cooldown. In MODE 3, the steam generators continue to be available for steaming to maintain RCS parameters and steam generator makeup can be provided by the turbine driven auxiliary feedwater pump. This can minimize DG loading while attempts are made to restore offsite power. If one or more offsite circuits remains inoperable for > 72 hours while in MODE 3, the actions of Condition A would not be met and Condition H would apply. Required Action H.2 will further require action to place the unit in MODE 4. However, voluntary entry into MODE 4 or 5 may be made as these MODES are also acceptable low risk states.

The allowed Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~

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If a Required Action of Conditions A, B, D, or E cannot be performed with its associated Completion Time,

~~If the inoperable AC electrical power sources cannot be restored to OPERABLE status within the required Completion Time,~~ the unit must be brought to a MODE in which plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. ①

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. ~~7~~ 8). In MODE 5, it is likely that increased plant maintenance activities (particularly those involving the switchyard) will make the plant more susceptible to loss of offsite power events. In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state. ①

Required Action G.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

H.1

Condition H corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. ~~9~~10). ①

Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 1~~0~~1), and Regulatory Guide 1.137 (Ref. 1~~1~~2), as addressed in the UFSAR. ①

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of Insert 7 ~~[3740] V is 90% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1-1982 (Ref. 12), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 80% of name plate rating. The specified maximum steady state output voltage of [4756] V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3)~~. ② ①

SR 3.8.1.1

This SR ensures correct breaker alignment for each ~~[required]~~ offsite circuit to ensure that distribution buses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. The SR also verifies the indicated availability of three-phase AC electrical power from each ~~[required]~~ offsite circuit to the ②

Insert 7 ①

3950 V is 95% of the nominal 4160 V output voltage. This value, which is conservative with respect to the value specified in ANSI C84.1-1989 (Ref. 13), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level. The minimum steady state output voltage ensures the operating system voltage for the 480 V switchgear is ≥ 90% of nominal bus voltage, which bounds the 90% criterion of the safety related motor voltage ratings. The specified maximum steady state output voltage of 4370 V bounds the maximum operating bus voltage. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is such that continuous operation of motor loads does not result in a failure of the load due to overheating. The specified minimum and maximum frequencies of the DG are 59.4 Hz and 60.6 Hz, respectively. These values are equal to ± 1% of the 60 Hz nominal frequency and are conservative with respect to the recommendations given in Regulatory Guide 1.9 (Ref. 3). The under frequency limit considers reduced pump flow and discharge pressure and reduced motor operated valve stroke times during accident sequences. The over frequency limit considers net positive suction head of safety related pumps, increased differential pressure across closed valves, and increased DG fuel oil and lube oil consumption.

BASES

SURVEILLANCE REQUIREMENTS (continued)

onsite distribution network. ~~[The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room~~. ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
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SR 3.8.1.2 and SR 3.8.1.7

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs are modified by a Note (Note 1 for SR 3.8.1.2 and Note for SR 3.8.1.7) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading ~~by an engine prelube period~~. ①

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGs are started from standby conditions. Standby conditions for a DG mean the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

~~[~~In order to reduce stress and wear on diesel engines, the DG manufacturer~~s~~ recommend s a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to ~~—~~synchronous speed prior to loading. This is the intent of SR 3.8.1.2 Note 2, which is only applicable when such modified start procedures are recommended by the manufacturer. ②

SR 3.8.1.7 requires that the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the U FSAR, Chapter 6 (Ref. 4) and Chapter ~~[~~15~~]~~ (Ref. 5).~~]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 2) when a modified start procedure as described above is used. If a modified start is not used, 10 second start requirement of SR 3.8.1.7 applies.

Since SR 3.8.1.7 requires a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2.

In addition to the SR requirements, the time for the DG to reach steady state operation, unless the modified DG start method is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

~~[The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 8). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.~~

~~OR~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between ~~[~~0.8 lagging~~]~~ and ~~[~~1.0~~]~~. The 0.8 value is the design rating of the machine, while ~~[~~1.0~~]~~ is an operational limitation ~~[~~to ensure circulating currents are minimized~~]~~. ~~[The 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 3).~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

to operate the engine at rated capacity for a sufficient duration to prevent cycling of the fuel oil transfer pump and maintain 60 minutes of operation at rated capacity.

SR 3.8.1.4

engine mounted day tanks (one tank per engine)

This SR provides verification that the level of fuel oil in the day tank ~~[and engine mounted tank]~~ is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons, and is selected to ensure adequate fuel oil ~~for a minimum of 1 hour of DG operation at full load plus 10%~~. ② ①

~~[The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.~~

~~OR~~ ②

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~--------------------------------REVIEWER'S NOTE--------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day ~~[and engine mounted]~~ tanks eliminates the necessary ② environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~[The Surveillance Frequency of 31 days is established by Regulatory Guide 1.137 (Ref. 11). This SR is for preventive maintenance.~~ ②

~~OR~~

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

~~--------------------------------REVIEWER'S NOTE--------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

The presence of water does not necessarily represent failure of this SR provided the accumulated water is removed during the performance of this Surveillance.

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from its associated storage tank to its associated day tank s. This is required to support continuous operation of ①

SURVEILLANCE REQUIREMENTS (continued)

standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

~~[[The Frequency for this SR is variable, depending on individual system design, with up to a [92] day interval. The [92] day Frequency corresponds to the testing requirements for pumps as contained in the ASME Code (Ref. 13); however, the design of fuel transfer systems is such that pumps will operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day [and engine mounted] tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate. Since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY, the Frequency of this SR should be modified to reflect individual designs.~~ ②

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]]~~ ②

SR 3.8.1.7

See SR 3.8.1.2.

~~[~~ SR 3.8.1.8

Transfer of each ~~[~~4.16 kV ESF bus~~]~~ power supply from the normal ~~offsite~~ circuit, (i.e., unit auxiliary transformer) to the ~~alternate~~ offsite circuit demonstrates the OPERABILITY of the offsite ~~alternate~~ circuit distribution network to power the shutdown loads. ~~[The [18 month] Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ ① ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

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

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. ~~[~~For this unit, the single load for each DG and its horsepower rating is ~~as follows:]~~ an intake cooling water pump with a nameplate rating of 600 hp. This Surveillance may be accomplished by: ②

SURVEILLANCE REQUIREMENTS (continued)

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

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

As required by IEEE-308 (Ref. 14), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 1.8 ~~[3]~~ seconds specified is equal to 60% of a 3 ~~typical 5~~ second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the DG ~~system~~ must recover following load rejection~~. [The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 10).~~ ① ① ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns)

BASES

SURVEILLANCE REQUIREMENTS (continued)

provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ ~~[~~0.9~~]~~. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 2 allows the Surveillance to be conducted at a power factor other than ≤ ~~[~~0.9~~]~~. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ ~~[~~0.9~~]~~ results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to ~~[~~0.9~~]~~ while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of ~~[~~0.9~~]~~ may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to ~~[~~0.9~~]~~ without exceeding the DG excitation limits. ②

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable~~:

~~a. Performance of the SR will not render any safety system or component inoperable,~~

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

~~c. Performance of the SR or failure of the SR will not cause or result in an AOO with attendant challenge to plant safety systems.~~
~~---~~ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

19

SR 3.8.1.~~10~~

Move Bases discussion to after SR 3.8.1.18

⑥

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

~~[The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 10) and is intended to be consistent with expected fuel cycle lengths.~~

~~OR~~

②

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

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~

④

②

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system

BASES

SURVEILLANCE REQUIREMENTS (continued)

when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ ~~[~~0.9~~]~~. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 2 allows the Surveillance to be conducted at a power factor other than ≤ ~~[~~0.9~~]~~. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ ~~[~~0.9~~]~~ results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to ~~[~~0.9~~]~~ while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of ~~[~~0.9~~]~~ may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to ~~[~~0.9~~]~~ without exceeding the DG excitation limits. ②

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:~~

~~a. Performance of the SR will not render any safety system or component inoperable,~~

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

~~c. Performance of the SR or failure of the SR will not cause or result in an AOO with attendant challenge to plant safety systems.~~
~~--~~ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.1~~1~~ 0 ⑥

As required by Regulatory Guide 1.108 (Ref. 1~~0~~ 1), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time. ①

The DG auto-start time of ~~[~~10~~]~~ seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved. ②

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

~~[The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~ ②

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

~~[~~SR 3.8.1.1~~2~~1 ⑥ ②

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (~~[~~10~~]~~ seconds) from the ~~design basis~~ ESF actuation signal ~~(LOCA signal)~~ and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.1~~2~~1.d and SR 3.8.1.1~~2~~1.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power. ② ⑥ ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~[The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that during operation with the reactor ~~–~~critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing ⑤

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.8.1.12~~3~~ ⑥

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation ~~test~~ signal. Noncritical automatic trips are all automatic trips except: ①

a. Engine overspeed; and ①

b. Generator differential current~~;~~

~~[c. Low lube oil pressure;~~

~~d. High crankcase pressure; and~~

~~e. Start failure relay.]~~ ②

The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

~~[The [18 month] Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:~~

~~a. Performance of the SR will not render any safety system or component inoperable,~~ ④

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~c. Performance of the SR or failure of the SR will not cause or result in an AOO with attendant challenge to plant safety systems.~~ ④

~~--~~

SR 3.8.1.1~~4~~3 ⑥ ①

Regulatory Guide 1.108 (Ref. 1~~0~~1), paragraph 2.a.(3), requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ~~≥ [~~2~~]~~ hours of which is at the 2 hour rating (i.e., a load equivalent to 110% of the continuous duty rating) and the remainder of the time at a load equivalent to the continuous duty rating of the DG. This SR meets the intent of this requirement to the extent practical by loading the DG to approximately 104% of the engine continuous duty rating not to exceed the 2000 hour rating. This loading requirement challenges the full loading capability of the DG without unnecessarily overloading the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR. ② ①

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

~~[The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 8), paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④

~~--]~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test. ~~The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.~~ ② ~~C~~redit may be taken for unplanned events that satisfy this SR. Note 3 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ ~~[~~0.9~~]~~. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 3 allows the Surveillance to be conducted at a power factor other than ≤ ~~[~~0.9~~]~~. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ ~~[~~0.9~~]~~ results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to ~~[~~0.9~~]~~ while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of ~~[~~0.9~~]~~ may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close practicable to ~~[~~0.9~~]~~ without exceeding the DG excitation limits. ②

Note 2 provides an allowance that c

BASES

SURVEILLANCE REQUIREMENTS (continued)

Move Bases discussion to after SR 3.8.1.19

SR 3.8.1.~~15~~ 20 ⑥

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within ~~[~~10~~]~~ seconds. The ~~[~~10~~]~~ second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. ~~[The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(5).~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least ~~[~~2~~]~~ hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.1~~6~~4 ⑥

As required by Regulatory Guide 1.108 (Ref. 1~~0~~1), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and that the DG can be returned to ready to load status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the DG to reload if a ①

SURVEILLANCE REQUIREMENTS (continued)

subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an~~d~~ autoclose signal on bus undervoltage, and the load sequence timers are reset. ⑤

~~[The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(6), and takes into consideration unit conditions required to perform the Surveillance.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~

~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④

~~---]~~ ②

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[~~SR 3.8.1.1~~7~~ 5 ⑥ ②

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a ~~LOCA~~ safety injection actuation signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 14), paragraph 6.2.6(2). ①

The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.1~~2~~ 1. The intent in the requirement associated with SR 3.8.1.1~~7~~ 5.b is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified. ⑥

~~[The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(8); takes into consideration unit conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing

SURVEILLANCE REQUIREMENTS (continued)

following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR. ~~]~~ ②

SR 3.8.1.1 6 ~~8~~ ⑥

Under accident ~~[~~and loss of offsite power~~]~~ conditions loads are sequentially connected to the bus by the ~~[automatic~~ load sequence~~r]~~ timers. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The ~~[10]%~~ ±1 second load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. ~~Reference 1 provides a summary of the automatic loading of ESF buses.~~ ③ ①

~~[The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(2); takes into consideration unit conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.~~

~~OR~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ④ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:~~

~~a. Performance of the SR will not render any safety system or component inoperable,~~

~~b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and~~

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

~~---~~

④

7

SR 3.8.1.1~~9~~ ⑥

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.10~~11~~, during a loss of offsite power actuation ~~test~~ signal ⑥ ① in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

~~[The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of [18 months].~~ ②

~~OR~~

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

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they

SURVEILLANCE REQUIREMENTS (continued)

are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.~~20~~18 ⑥

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

~~[The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 10).~~ ②

~~OR~~

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

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated, and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Chapter ~~[~~8~~]~~. ①
3. Regulatory Guide 1.9, Rev. ~~[3]~~0. ②
4. UFSAR, Chapter ~~[~~6~~]~~. ①

BASES

REFERENCES (continued)

7. NRC Letter, “St. Lucie Unit No. 2 – Issuance of Amendment Regarding Diesel Generator Allowed Outage Time Extension (TAC No. MA7206),” dated April 26, 2001 (ML011210391). ① ②

5. U FSAR, Chapter ~~[~~15~~]~~.

6. Regulatory Guide 1.93, Rev. ~~[~~ 1 ~~], [date]~~.

~~7~~ 8. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

~~8~~ 9. Generic Letter 84-15.

~~9~~ 10. 10 CFR 50, Appendix A, GDC 18.

~~10~~ 11. Regulatory Guide 1.108, Rev. ~~[~~1~~], [August 1977]~~. ① ②

~~11~~ 12. Regulatory Guide 1.137, Rev. ~~[~~ 1 ~~], [date]~~.

~~12~~ 13. ANSI C84.1-198~~2~~ 9.

~~13. ASME Code for Operation and Maintenance of Nuclear Power Plants.~~

14. IEEE Standard 308-~~[~~197~~8]~~ 1. ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.1 BASES, AC SOURCES - OPERATING

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Discussions regarding load sequencers have been deleted, because PSL does not use load sequencers. Each load is sequenced with the use of its associated load sequence timer.

4. The Reviewer's Note has been deleted, because it is not meant to be retained in the plant specific ITS submittal.

5. Editorial/grammatical error corrected.

6. Changes have been made to be consistent with changes made to the Specifications.

7. Corrections have been made consistent with the Writer’s Guide for the Improved Technical Specifications, TSTF-GG-05-01, Section 3.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.1, AC SOURCES - OPERATING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 2

ITS 3.8.2, AC Sources - Shutdown

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

A01

ELECTRICAL POWER SYSTEMS

AC SOURCES -

SHUTDOWN

LIMITING CONDITION FOR OPERATION

T

LCO 3.8.2 3.8.1.2 ~~As a minimum, t~~he following A~~.~~C~~.~~ electrical power sources shall be OPERABLE:

qualified

LCO 3.8.2.a a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and

AC electrical power

sub (s) required by LCO 3.8.10, "Distribution Systems Shutdown"

A02

LCO 3.8.2.b b. One diesel generator set ~~with:~~ capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

A03

1. Engine-mounted fuel tanks containing a minimum of 152 gallons of fuel, — See ITS 3.8.1
2. A fuel storage system containing a minimum of 19,000 gallons of fuel, and — See ITS 3.8.3
3. A fuel transfer pump. — See ITS 3.8.1

Applicability **APPLICABILITY:** MODES 5 and 6~~.~~ ,

During movement of irradiated fuel assemblies.

M01

ACTION:

Insert proposed ACTIONS NOTE

ACTION A NOTE

NOTE

applicable Conditions and Required Actions of LCO 3.8.10,

Enter ~~the ACTION of LCO 3.8.2.2, "A.C. Distribution - Shutdown,"~~ with one required train de-energized as a result of ~~inoperable offsite circuit~~. Condition A

Add proposed Required Action A.1 and Completion Time

L01

assemblies

ACTION A ACTION B

ACTION A.2.1, A.2.2, B.1, and B.2

ACTION A.2.3 and B.3

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations ~~involving CORE ALTERATIONS, operations~~ involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or boron concentration, movement of irradiated fuel ~~or crane operation with loads over the fuel storage pool~~. In addition, ~~when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the top of irradiated fuel assemblies seated within the reactor vessel,~~ immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

L02

M02

SURVEILLANCE REQUIREMENTS

Insert proposed SR 3.8.2.1 NOTE

L04

SR 3.8.2.1 4.8.1.2.1 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of ~~4.8.1.1.1 and 4.8.1.1.2 except for requirement 4.8.1.1.2a.5~~.

Specification 3.8.1 Surveillances

Add proposed SR 3.8.2.1 exceptions

L05

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

T

LCO 3.8.2 3.8.1.2 ~~As a minimum, t~~he following A~~.~~C~~.~~ electrical power sources shall be OPERABLE:

qualified

LCO 3.8.2.a a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and

AC electrical power A02

sub (s) required by LCO 3.8.10, "Distribution Systems Shutdown"

LCO 3.8.2.b b. One diesel generator ~~with:~~ capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10. A03

1. Two engine-mounted fuel tanks containing a minimum volume of 238 gallons of fuel,

See ITS 3.8.1

2. A fuel storage system containing a minimum volume of 42,500 gallons of fuel, and

3. A fuel transfer pump.

See ITS 3.8.1

See ITS 3.8.3

Applicability **APPLICABILITY:** MODES 5 and 6~~.~~ ,

During movement of recently irradiated fuel assemblies. M01

ACTION:

Insert proposed ACTIONS NOTE

ACTION A NOTE

NOTE

applicable Conditions and Required Actions of LCO 3.8.10,

Enter ~~the ACTION of LCO 3.8.3.2, "Onsite Power Distribution - Shutdown,"~~ with one required train de-energized as a result of ~~inoperable offsite circuit~~. Condition A

Add proposed Required Action A.1 and Completion Time L01

ACTION A ACTION B With less than the above minimum required A.C. electrical power sources OPERABLE, assemblies

ACTION A.2.1, A.2.2, B.1, and B.2 immediately suspend all operations ~~involving CORE ALTERATIONS, operations~~ involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or boron concentration, movement of irradiated fuel ~~or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through a greater than or equal to 3.58 square inch vent~~. In addition, ~~when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange,~~ immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible~~.~~ L02 L03 M02

ACTION A.2.3 and B.3

SURVEILLANCE REQUIREMENTS

Insert proposed SR 3.8.2.1 NOTE L04

SR 3.8.2.1 4.8.1.2.1 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of ~~4.8.1.1.1 and 4.8.1.1.2 (except for requirement 4.8.1.1.2a.5)~~.

Specification 3.8.1 Surveillances

Add proposed SR 3.8.2.1 exceptions L05

DISCUSSION OF CHANGES
ITS 3.8.2, AC SOURCES - SHUTDOWN

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.8.1.2.a states one circuit between the offsite transmission network and the onsite Class 1E distribution system shall be OPERABLE. ITS 3.8.2.a states one qualified circuit between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System shall be OPERABLE. This changes the CTS requirement by modifying the description of the offsite circuit to the ITS requirement for the circuit description of “qualified.”

The change is acceptable because the ITS requirement for the offsite circuit remains consistent with the intent of the CTS requirement. The ITS requirement of being “qualified” provides a clarification for the offsite circuit requirements consistent with the existing design requirements for these circuits. The change in wording does not modify the technical requirement for the CTS. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as administrative because the technical requirements of the specifications have not changed.

A03 CTS 3.8.1.2.b requires one diesel generator set to be OPERABLE. ITS LCO 3.8.2 b states “One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10,” shall be OPERABLE. This changes the CTS by stating that the DG set is capable of supplying the required electrical power to the distribution subsystem(s) required by LCO 3.8.10.

This change is acceptable because the ITS requirement for the DG set remains consistent with the intent of the less explicit CTS requirement. The addition of the ISTS wording, “capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10,” provides a clarifying statement for the CTS requirements that is consistent with the DG OPERABILITY requirements in these MODES. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as administrative because the technical requirements of the specifications have not changed.

MORE RESTRICTIVE CHANGES

M01 CTS 3.8.1.2 is applicable during MODES 5 and 6. ITS 3.8.2 is applicable in MODES 5 and 6, and during the movement of irradiated fuel assemblies. In addition, a Note has been added to the ACTIONS of ITS 3.8.2 that states

LCO 3.0.3 is not applicable. This changes the CTS by requiring the AC Sources to be OPERABLE under more conditions than is currently required.

The purpose of CTS 3.8.1.2 is to ensure that sufficient AC Sources are available to mitigate the consequences of an analyzed event during shutdown modes. This change also provides an explicit requirement that the AC Sources must be OPERABLE during the movement of irradiated fuel assemblies. The movement of irradiated fuel assemblies may occur during MODE 5 or 6, however movement of irradiated fuel assemblies could also occur while the unit is operating or defueled if moving fuel only in the spent fuel pool. CTS 3.8.1.1 (ITS 3.8.1) does not provide the appropriate compensatory actions under this condition. The activity should be suspended immediately when the AC Sources are not available consistent with the immediate actions for CORE ALTERATIONS in the CTS 3.8.1.2 Action. Because the actions provided in LCO 3.0.3 will not place the unit in a safe condition with respect to the applicable condition, a modifying Note is added to the ITS ACTIONS. This change is acceptable because the proposed Applicability is consistent with the Applicability in the AC Distribution System – Shutdown Specification (ITS 3.8.10). AC Sources provide the power for the AC Electrical Distribution System. This change is designated as more restrictive because the Applicability of the Specification, although modified, has been expanded.

M02 The Unit 1 CTS 3.8.1.2 Action requires, in part, immediate initiation of corrective action to restore the sources to OPERABLE status with less than the minimum AC electrical power sources in MODE 5 with reactor coolant loops not filled or in MODE 6 with water level less than 23 feet above the top of irradiated fuel assemblies seated within the reactor vessel. Unit 2 CTS 3.8.1.2 Action requires, in part, immediate initiation of corrective action to restore the sources to OPERABLE status with less than the minimum AC electrical power sources in MODE 5 with reactor coolant loops not filled or in MODE 6 with water level less than 23 feet above the reactor vessel flange. ITS 3.8.2 Required Actions A.2.3 and B.3 require the immediate initiation of action to restore the required AC Sources to OPERABLE status. This changes the CTS by expanding the Action requirement to restore the inoperable AC Sources to OPERABLE status regardless of fill status of the reactor coolant loops or the water level above the top of irradiated fuel (Unit 1) or reactor vessel flange (Unit 2).

The purpose of ITS 3.8.1.2 Required Actions A.2.3 and B.3 is to promptly initiate action to restore the LCO requirements. When a required offsite circuit or one required DG is inoperable, the actions imposed by the CTS 3.8.1.2 ACTION do not necessarily place the unit in a MODE or other specified condition in which CTS 3.8.1.2 is not applicable. Therefore, proposed ITS 3.8.2 Required Actions A.2.3 and B.3 are being expanded to apply in all plant configurations in MODES 5 and 6. When in MODE 5 with the reactor coolant loops filled and MODE 6 with water level ≥ 23 ft above the reactor vessel flange, at least one shutdown cooling loop is required to be OPERABLE and in operation and two trains of the Control Room Emergency Ventilation System are required to be OPERABLE during movement of irradiated fuel assemblies. Therefore, AC Sources are, at a minimum, required to be OPERABLE to support these required systems to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power. These additional restrictions will ensure action is immediately taken to restore compliance with the LCO requirements. This change is designated as more restrictive because the CTS Required Actions are expanded apply to all plant configurations in MODES 5 and 6 and during movement of irradiated fuel assemblies.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* The CTS 3.8.1.2 ACTION requires the suspension of certain activities when the minimum required AC electrical power sources are inoperable. ITS 3.8.2 provides an alternate Required Action (ITS 3.8.2 Required Action A.1) that allows the declaration of affected required feature(s) with no offsite power available inoperable instead of requiring the specified activities to be suspended. This changes the CTS by allowing the affected required feature(s) with no offsite power available to be declared inoperable instead of suspending the specified activities.

The purpose of CTS 3.8.1.2 is to ensure the appropriate offsite circuit is OPERABLE. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a loss of offsite power occurring during the repair period. This changes the CTS by allowing the affected required feature(s) with no offsite power available to be declared inoperable instead of suspending specified activities (i.e., movement of irradiated fuel assemblies). Since the ITS 3.8.2 circuit OPERABILITY requirements are proposed to require supplying power to all required electrical power distribution subsystems, if one or more subsystems are not powered by an offsite circuit, that circuit is inoperable. Conservative actions can be assured if required equipment with no offsite power is declared inoperable and the associated ACTIONS of the individual equipment taken (ITS 3.8.2 Required Action A.1). This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.8.1.2 ACTION states, in part, with less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS …or crane operation with loads over the fuel storage pool. ITS 3.8.2 ACTIONS do not include these actions. This changes the CTS Actions by removing actions to immediately suspend all operations involving CORE ALTERATIONS or crane operation with loads over the fuel storage pool.

The purpose of the CTS 3.8.1.2 ACTION is to minimize the possibility of an event that may require the AC source to mitigate the consequences of a design basis event. CORE ALTERATIONS is defined in CTS 1.9, in part, as "the movement or manipulation of any fuel, sources, reactivity control components, or other components affecting reactivity, within the reactor vessel with the head removed and fuel in the vessel." CORE ALTERATIONS only occur when the reactor vessel head is removed - it only applies in MODE 6. There is only one accident considered during MODE 6 that involves a CORE ALTERATION: a fuel handling accident. According to the Unit 1 UFSAR Section 15.4.3 and Unit 2 UFSAR Section 15.7.4.1.2, a fuel handling accident is initiated by the dropping of an irradiated fuel assembly either in the containment or in the fuel building. Suspension of CORE ALTERATIONS, except for suspension of movement of irradiated fuel, will not prevent or impair the mitigation of a fuel handling accident.

Crane travel related requirements were relocated from the CTS in Unit 1 and Unit 2 PSL Amendments 190 and 134, respectively, (“St. Lucie Units 1 and 2 – Issuance of Amendments Regarding the Relocation of Spent Fuel Pool Crane Technical Specification Requirements (TAC NOS. MB5667 and MB5668),” dated April 28, 2004 (ADAMS Accession No. ML 040440111)) to the respective unit Updated Final Safety Analysis Report where the operational detail is controlled under 10 CFR 50.59 criteria. As cited in the NRC Safety Evaluation associated with Amendments 190 (Unit 1) and 134 (Unit 2), NUREG-0612, “Control of Heavy Loads at Nuclear Power Plants,” regulatory guidelines for control of heavy load lifts provide assurance of safe handling of heavy loads in areas where a load drop could impact stored spent fuel, fuel in the reactor core, or equipment that may be required to achieve safe shutdown or permit continued decay heat removal. Section 5.1.1 of NUREG-0612 provides guidelines for reducing the likelihood of dropping heavy loads and provides criteria for establishing safe load paths; procedures for load-handling operations; training of crane operators; design, testing, inspection, and maintenance of cranes and lifting devices; and analyses of the impact of heavy load drops. The guidelines in Sections 5.1.2 through 5.1.6 address alternatives to either further reduce the probability of a load-handling accident or mitigate the consequences of heavy load drops. These alternatives include using a single-failure-proof crane to improve reliability through increased factors of safety and through redundancy or duality in certain active components. Criteria for design of single-failure-proof cranes are included in NUREG-0554, “Single-Failure-Proof Cranes for Nuclear Power Plants.”

This change is acceptable because the possibility of damage to a fuel assembly as a consequence of mishandling components other than an irradiated fuel assembly is minimized by thorough training, detailed procedures and equipment design. The PSL crane design precludes the handling of heavy objects, such as shipping casks, over the spent fuel pool storage racks. Administrative controls prevent the movement of heavy loads over the cask pit whenever the cask pit rack is installed in the cask area of the spent fuel storage pool. In addition, the cask handling crane design meets the regulatory guidance for single-failure-proof cranes in NUREG-0554, “Single-Failure-Proof Cranes for Nuclear Power Plants” and NUREG-0612. Administrative controls that control of movement of light loads or prevent movement of light loads over irradiated fuel assemblies are similar to those used for control of heavy loads, to the extent practicable, as advised in NUREG-0612. Consequently, the possibility of dropping a load other than an irradiated fuel assembly and damaging of fuel assemblies in the spent fuel storage pool is remote. Therefore, the CTS 3.8.1.2 action related to suspension of crane operation with loads over the fuel storage pool is not necessary to be included in the technical specifications and are removed.

This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L03 **Unit 2 Only** *(Category 4 – Relaxation of Required Action)* CTS 3.8.1.2 ACTION requires, in part, with less than the minimum required AC electrical power sources OPERABLE, the Reactor Coolant System (RCS) to be depressurized and vented through a greater than or equal to 3.58 square inch vent within 8 hours. ITS 3.8.2 does not include this required action.

The purpose of CTS is to ensure the minimum AC electrical power sources are OPERABLE. CTS 3.4.9.3 provides specific OPERABILITY requirements for overpressure protection systems when in MODE 5 and MODE 6 with the reactor vessel head on. The definition of OPERABLE in CTS 1.19 requires necessary electrical power to components so they can perform their required safety function. This change is acceptable because CTS 3.4.9.3 Action a.1 requires depressurization and venting of the RCS when adequate pressure relief methods are inoperable, including the loss of electrical power necessary to support the required pressure relief components. ITS 3.4.12 retains the requirement to depressurize and establish the required RCS vent size (Refer to ITS 3.4.12 for any changes to CTS 3.4.9.3 requirements). Therefore, the CTS 3.8.1.2 action to depressurize the RCS and vent through a greater than or equal to 3.58 square inch vent is unnecessary. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.8.1.2.1 requires the AC electrical power sources to be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1 and 4.8.1.1.2 except for requirement 4.8.1.1.2.a.5. ITS SR 3.8.2.1 includes the performance exception in the Note to SR 3.8.2.1. However, the Note provides additional ITS 3.8.1 SRs exempt from being required to be performed. ITS SR 3.8.2.1 Note 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 3.8.1.12 through SR 3.8.1.14, and SR 3.8.1.16. The Note to Unit 2 ITS SR 3.8.2.1 also includes SR 3.8.1.19 and SR 3.8.1.20.

This changes the performance Frequency of specific CTS 4.8.1.1 Surveillances required by CTS 4.8.1.2.1 by suspending the performance requirement of the Surveillances in MODES 5 and 6 and other specified conditions in the Applicability until the AC Source is no longer required to meet the AC Sources – Shutdown LCO.

The purpose of CTS 3.8.1.2 is to ensure the AC Sources required when in MODE 5 or 6 or during movement of irradiated fuel assemblies are demonstrated to be OPERABLE. Currently CTS 4.8.1.1.2.a.5 is not required to be performed (however it must be met). CTS 4.8.1.1.2.e.2 (ITS SR 3.8.1.9) demonstrates the DG capability to reject the single largest load, Unit 1 CTS 4.8.1.1.2.e.3 and Unit 2 CTS 4.8.1.1.2.e.4 (ITS SR 3.8.1.10) verifies a DG start on a loss of offsite power, Unit 2 CTS 4.8.1.1.2.e.3 (ITS SR 3.8.1.19) verifies that the DG does not trip on a load reject, Unit 1 CTS 4.8.1.1.2.e.5.c and Unit 2 CTS 4.8.1.1.2.e.6.c (ITS 3.8.1.12) demonstrates the DG noncritical protective functions are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal, Unit 1 CTS 4.8.1.1.2.e.6 and Unit 2 CTS 4.8.1.1.2.e.7 (ITS SR 3.8.1.13) is the DG 24 hour run test, Unit 2 CTS 4.8.1.1.2.e.13 (ITS SR 3.8.1.20) is the DG hot restart test, Unit 1 CTS 4.8.1.1.2.e.8 and Unit 2 CTS 4.8.1.1.2.e.9 (ITS SR 3.8.1.14) ensures manual synchronization and automatic load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored, and Unit 1 CTS 4.8.1.1.2.e.11 and Unit 2 CTS 4.8.1.1.2.e.12 (ITS SR 3.8.1.16) is a test of the individual load sequence timers.

The tests listed in the proposed SR 3.8.2.1 Note normally require the DG to be paralleled with offsite power. With limited AC Sources available, a single event could compromise both the required offsite circuit and the DG, which presents a significant risk of a station blackout. The NRC has previously recognized this in the exception of CTS 4.8.1.1.2.a.5 in CTS 4.8.1.2.1. In an effort to consistently address this concern and to avoid potential conflicting Technical Specifications, the Surveillances that would require a DG to be connected to the offsite source or would require disconnection of the required offsite circuit and de-energization of required buses are excepted from being performed. The exception does not remove the requirement for the required DG to be capable of performing its related support function. The exception only removes the requirement to demonstrate the capability while that source of power is being relied on to meet the supporting LCO.

This change is acceptable because the SR specified in the Note will continue to be required to be capable of being met. Historically, the most probable result of performing a Surveillance is the verification of conformance with the requirements while failure to meet a Surveillance is typically discovered when not performing a surveillance test. Therefore, any risk of suspending Surveillance performance until the AC Source is no longer required to meet the AC Sources Shutdown LCO is offset by minimizing the risk of losing both required AC sources. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L05 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.8.1.2.1 requires the AC electrical power sources to be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of CTS 4.8.1.1.1 and CTS 4.8.1.1.2 except for CTS 4.8.1.1.2.a.5. ITS SR 3.8.2.1 has included a similar allowance to waive performance of the current Surveillance (ITS SR 3.8.1.3) in the Note to SR 3.8.2.1. However, ITS SR 3.8.2.1 exempts SRs from being required. ITS SR 3.8.2.1 does not require the following ITS 3.8.1 SRs: SR 3.8.1.8, SR 3.8.1.11, SR 3.8.1.15, SR 3.8.17, and SR 3.8.1.18.

This changes the CTS by not requiring specific CTS 4.8.1.1 Surveillances in MODES 5 and 6 and other specified conditions in the Applicability.

The purpose of CTS 3.8.1.2 is to ensure the AC Sources required when in MODE 5 or 6 or during movement of irradiated fuel assemblies are demonstrated OPERABLE. This change is acceptable because the deleted Surveillance Requirements are not necessary to verify that the required AC Sources can perform their required support function. Thus, the required AC Sources continue to be tested in a manner and at a Frequency necessary to give confidence that the equipment can perform its assumed electrical support function.

This change deletes the following CTS 4.8.1.1 Surveillances from being required in MODE 5 or 6 or during movement of irradiated fuel assemblies: CTS 4.8.1.1.1.b (ITS SR 3.8.1.8), the automatic and manual transfer of power sources from normal circuit (unit auxiliary transformer) to the offsite circuit (startup transformer), Unit 1 CTS 4.8.1.1.2.e.4 and Unit 2 CTS 4.8.1.1.2.e.5 (ITS SR 3.8.1.11), the ESF actuation signal DG start test, Unit 1 CTS 4.8.1.1.2.e.9 and Unit 2 CTS 4.8.1.1.2.e.10 (ITS SR 3.8.1.15), ESF signal override with DG operating in test mode test, Unit 1 CTS 4.8.1.1.2.e.5 and Unit 2 CTS 4.8.1.1.2.e.6 (ITS SR 3.8.1.17), ESF concurrent with loss of offsite power signal test, and CTS 4.8.1.1.2.f (ITS SR 3.8.1.18), the simultaneous DG start test.

ITS SR 3.8.1.8 is not required to be met since only one offsite circuit is required by ITS LCO 3.8.2. ITS SR 3.8.1.11 and SR 3.8.1.17 are not required to be met because the ESF actuation signal is not required to be OPERABLE in MODE 5 or 6 or during movement of irradiated fuel assemblies. A single event could compromise both the required offsite circuit and the DG, which presents a significant risk of a station blackout. Therefore, SR 3.8.1.15 is not required to be met so the DG is not required to synchronize to the offsite circuit. SR 3.8.1.18 is excepted because starting independence is not required for the DG that is not required to be OPERABLE. The required DG is required to start if a loss of offsite power occurs. Thus, the requirement to autostart the required DG on a loss of offsite power signal (ITS SR 3.8.1.10) continues to be required by ITS SR 3.8.2.1. This change is designated as less restrictive because Surveillances that are required in CTS will not be required in the ITS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources - Shutdown

3.8.1.2 LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

3.8.1.2.a a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems Shutdown" and

3.8.1.2.b b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

Applicability APPLICABILITY: MODES 5 and 6,
DOC M01 During movement of ~~[recently]~~ irradiated fuel assemblies. ②

ACTIONS

-----------------------------NOTE-----------------------------

DOC M01 LCO 3.0.3 is not applicable.

Action
DOC L01

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train de-energized as a result of Condition A. ---------------------------- A.1 Declare affected required feature(s) with no offsite power available inoperable. <u>OR</u>	 Immediately

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action DOC L02		A.2.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately	②
		<u>AND</u>		
Action		A.2.2 Suspend operations involving positive reactivity additions that could result in a loss of required SDM or boron concentration.	Immediately	
		<u>AND</u>		
DOC M02 Action		A.2.3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately	
Action	B. One required DG inoperable.	B.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately	②
		<u>AND</u>		
Action		B.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately	
		<u>AND</u>		
DOC M02 Action		B.3 Initiate action to restore required DG to OPERABLE status.	Immediately	

CTS

SURVEILLANCE REQUIREMENTS

SR 4.8.1.2.1
DOC L04

	SURVEILLANCE	FREQUENCY
SR 3.8.2.1	-----------------------------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.~~11~~ 10, 12 SR 3.8.1.~~13~~ through SR 3.8.1.~~16~~ 14, and ~~[~~SR 3.8.1.~~18~~ 16~~]~~. ---	
	For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources - Operating," except SR 3.8.1.8, SR 3.8.1.~~12~~ 11, SR 3.8.1.~~17~~ 15, SR 3.8. 1.~~19~~ 17, and SR 3.8.1.~~20~~ 18, are applicable.	In accordance with applicable SRs

DOC L05

③
②
③

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources - Shutdown

3.8.1.2 LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

3.8.1.2.a a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems Shutdown" and

3.8.1.2.b b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

Applicability APPLICABILITY: MODES 5 and 6,
DOC M01 During movement of ~~[recently]~~ irradiated fuel assemblies. ②

ACTIONS

--NOTE--

DOC M01 LCO 3.0.3 is not applicable.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Action	A. One required offsite circuit inoperable.	-------------------NOTE------------------ Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train de-energized as a result of Condition A. --	
DOC L01		A.1 Declare affected required feature(s) with no offsite power available inoperable. OR	Immediately

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action DOC L02		A.2.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately	②
		AND		
Action		A.2.2 Suspend operations involving positive reactivity additions that could result in a loss of required SDM or boron concentration.	Immediately	
		AND		
DOC M02 Action		A.2.3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately	
Action DOC L02	B. One required DG inoperable.	B.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately	②
		AND		
Action		B.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately	
		AND		
DOC M02 Action		B.3 Initiate action to restore required DG to OPERABLE status.	Immediately	

CTS

SURVEILLANCE REQUIREMENTS

SR 4.8.1.2.1
DOC L04

DOC L05

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	-----------------------------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.~~11~~ 10, SR 3.8.1.~~13~~ 12 through SR 3.8.1.~~16~~ 14, ~~and~~ ~~[SR 3.8.1.18]~~ SR 3.8.1.16, SR3.8.1.19, and SR 3.8.1.20. ③ ② --	
	For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources - Operating," except SR 3.8.1.8, SR 3.8.1.~~12~~ 11, SR 3.8.1.~~17~~ 15, SR 3.8.1.~~19~~ 17, and SR 3.8.1.~~20~~ 18, are applicable.	In accordance with applicable SRs ③

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.2, AC SOURCES - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The SRs have been changed to be consistent with the changes made to the Surveillance Requirements in ITS 3.8.1.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources - Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6 and during movement of ~~[recently]~~ irradiated fuel assemblies ensures that: ②

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel~~. ~~Due to radioactive decay, AC electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~. ②

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a

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: ①

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 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]~~). ②

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 U FSAR and are part of the licensing basis for the unit. ①

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.]~~ Insert 1 ②

degraded or

The DG must be capable of starting, accelerating to rated speed and voltage, connecting to its respective ESF bus 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. ① ②

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.]~~ ③

~~It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.~~ ①

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of ~~[recently]~~ irradiated fuel assemblies provide assurance that: ②

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, ②

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and

②

Insert 1

An offsite circuit consists of a unit startup transformer and the associated circuit path, including non-ESF buses, up to and including the feeder breaker to the respective unit 4.16 kV ESF bus. Alternately, when the unit startup transformer is unavailable, the associated offsite circuit may be supplied from either backfeeding power through the unit auxiliary transformer or the opposite unit startup transformer via the associated non-ESF buses. The Unit 2 startup transformer may only be utilized as a qualified offsite AC source to Unit 1 provided it is not supplying power to a Unit 2 bus while operating in MODE 1, 2, 3, or 4. The Unit 2 startup transformer may supply power to ESF buses of both units when both units are in MODE 5 or 6 or defueled.

APPLICABILITY (continued)

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

A.1

An offsite circuit would be considered inoperable if it were not available to one required ESF train. Although two trains may be required by LCO 3.8.10, the remaining train with offsite power available may be capable of supporting sufficient required features to allow continuation of ~~[recently]~~ irradiated fuel movement. By the allowance of the option to ② declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

A.2.1, A.2.2, A.2.3, B.1, B.2, and B.3

With the offsite circuit not available to all required trains, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend movement of ~~[recently]~~ irradiated fuel ② assemblies, and operations involving positive reactivity additions that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron

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~~ moderator temperature coefficient must also be evaluated to ensure they do not result in a loss of required SDM. ④

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 REQUIREMENTS

SR 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.~~12~~ 11 and SR 3.8.1.~~19~~ 17 are not required to be met because the ESF actuation signal is not required to be OPERABLE. SR 3.8.1.~~17~~ 15 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~~ 18 is excepted because starting independence is not required ~~with DG(s) that are~~ for the DG that is not required to be OPERABLE. ⑤ ① ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note. 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 these SRs must still be capable of 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. ①

REFERENCES None.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources - Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6 and during movement of ~~[recently]~~ irradiated fuel assemblies ensures that: ②

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel~~. ~~Due to radioactive decay, AC electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~. ②

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a

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 ① 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 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~~ ② ~~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. ①

U

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.]~~ Insert 1 ②

The DG must be capable of starting, accelerating to rated speed and voltage, connecting to its respective ESF bus on detection of bus degraded or 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. ① ②

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.]~~ ③

~~It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.~~ ①

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of ~~[recently]~~ irradiated fuel assemblies provide assurance that: ②

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, ②

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and

Insert 1 ②

An offsite circuit consists of a unit startup transformer and the associated circuit path, including non-ESF buses, up to and including the feeder breaker to the respective unit 4.16 kV ESF bus. Alternately, when the unit startup transformer is unavailable, the associated offsite circuit may be supplied from either backfeeding power through the unit auxiliary transformer or the opposite unit startup transformer via the associated non-ESF buses. The Unit 1 startup transformer may only be utilized as a qualified offsite AC source to Unit 2 provided it is not supplying power to a Unit 1 bus while operating in MODE 1, 2, 3, or 4. The Unit 1 startup transformer may supply power to ESF buses of both units when both units are in MODE 5 or 6 or defueled.

BASES

APPLICABILITY (continued)

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

A.1

An offsite circuit would be considered inoperable if it were not available to one required ESF train. Although two trains may be required by LCO 3.8.10, the remaining train with offsite power available may be capable of supporting sufficient required features to allow continuation of ~~[recently]~~ irradiated fuel movement. By the allowance of the option to declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS. ②

A.2.1, A.2.2, A.2.3, B.1, B.2, and B.3

With the offsite circuit not available to all required trains, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend movement of ~~[recently]~~ irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron ②

ACTIONS (continued)

concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive ~~MTC~~ moderator temperature coefficient must also be evaluated to ensure they do not result in a loss of required SDM. ④

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 REQUIREMENTS

SR 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.~~12~~ 11 and SR 3.8.1.~~19~~ 17 are not required to be met because the ESF actuation signal is not required to be OPERABLE. SR 3.8.1.~~17~~ 15 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~~ 18 is excepted because starting independence is not required ~~with DG(s) that are~~ for the DG that is not required to be OPERABLE. ⑤ ① ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR is modified by a Note. 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 these SRs must still be capable of 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. ①

REFERENCES None.

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.2 BASES, AC SOURCES - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Discussions regarding automatic load sequencers have been deleted, because PSL does not use load sequencers. Each electrical load is sequenced by its associated load sequence timers.

4. Corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 3.2.2.a.

5. Changes have been made to be consistent with changes made to the Specifications.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.2, AC SOURCES - SHUTDOWN

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 3

ITS 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

See ITS 3.8.1

Add proposed LCO 3.8.3

A02

LCO 3.8.3 3.8.1.1 ~~As a minimum, the following A.C. electrical power sources shall be OPERABLE:~~

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generator sets each with:

1. Engine-mounted fuel tanks containing a minimum of 152 gallons of fuel,

LA01

SR 3.8.3.1 2. A separate fuel storage system containing a minimum of ~~19,000 gallons~~ a 7 day supply of fuel, and

M02

3. A separate fuel transfer pump.

See ITS 3.8.1

A02

Applicability **APPLICABILITY**: ~~MODES 1, 2, 3 and 4.~~ When associated DG is required to be OPERABLE

A03

ACTIONS **ACTION**:

Add proposed ACTIONS Note

Add proposed ACTION A

L01

Add proposed ACTIONS C and D

L02

a. With one offsite circuit of 3.8.1.1.a inoperable, except as provided in Action f below:

1. Demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter.

2. Within 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required features(s), declare required features(s) with no offsite power available inoperable when its redundant required features(s) is inoperable.

3. Restore the offsite circuit to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

4. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.8.1

Add proposed ACTIONS B and E

M01

Add proposed ACTION F

M01

L01

L02

ELECTRICAL POWER SYSTEMS

ACTION (continued)

See ITS 3.8.1

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in the at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Following restoration of one diesel generator unit, follow ACTION Statement b. with the time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable diesel generator.

f. With one Unit 1 startup transformer (1A or 1B) inoperable and with a Unit 2 startup transformer (2A or 2B) connected to the same A or B offsite power circuit and administratively available to both units, then should Unit 2 require the use of the startup transformer administratively available to both units, Unit 1 shall demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the inoperable startup transformer to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

g. LCO 3.0.4.b is not applicable to diesel generators.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments, indicated power availability; and

b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring (manually and automatically) unit power supply from the auxiliary transformer to the startup transformer.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

See ITS 3.8.1

SR 3.8.3.1 a. In accordance with the Surveillance Frequency Control Program by:

1. Verifying fuel level in the engine-mounted fuel tank,

SR 3.8.3.1 2. Verifying the fuel level in the fuel storage tank,

See ITS 3.8.1

3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the engine-mounted tank,

Add proposed SR 3.8.3.2

M01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (continued)

See ITS 3.8.1

4. Verifying the diesel starts from ambient condition and accelerates to approximately 900 rpm in less than or equal to 10 seconds**. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the start signal**. The diesel generator shall be started for this test by using one of the following signals:

   a) Manual/Local

   b) Simulated loss-of-offsite power by itself.

   c) Simulated loss-of-offsite power in conjunction with an ESF actuation test signal.

   d) An ESF actuation test signal by itself.

5. Verifying the generator is synchronized, loaded to greater than or equal to 3500 kW in accordance with the manufacturer's recommendations and operates within a load band of 3300 to 3500 kW*** for at least an additional 60 minutes, and

6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

SR 3.8.3.5 b. ~~By removing~~ Check for and remove accumulated water:

See ITS 3.8.1

1. From the engine-mounted fuel tank in accordance with the Surveillance Frequency Control Program and after each occasion when the diesel is operated for greater than 1 hour, and

SR 3.8.3.5 2. From ~~the~~ each fuel oil storage tank in accordance with the Surveillance Frequency Control Program.

See ITS 3.8.1

** The diesel generator start (10 sec.) from ambient conditions shall be performed in accordance with the Surveillance Frequency Control Program in these surveillance tests. All other diesel generator starts for the purposes of this surveillance testing may be preceded by an engine prelube period and may also include warmup procedures (e.g., gradual acceleration) as recommended by the manufacturer so that mechanical stress and wear on the diesel generator is minimized.

*** The indicated load band is meant as guidance to avoid routine overloading. Variations in loads in excess of the band due to changing bus loads shall not invalidate this test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.8.3.3 c. Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.

d. DELETED

e. In accordance with the Surveillance Frequency Control Program by:

1. DELETED

2.

> **NOTE**
>
> Credit may be taken for unplanned events that satisfy this SR.

Verifying generator capability to reject the single largest post-accident load while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz.

3.

> **NOTE**
>
> This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines that the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

Verifying that upon an actual or simulated loss of offsite power signal by itself.

a) Deenergization of the emergency busses and load shedding from the emergency busses.

See ITS 3.8.1

Add proposed SR 3.8.3.4

M01

ELECTRICAL POWER SYSTEMS

SHUTDOWN

LIMITING CONDITION FOR OPERATION

See ITS 3.8.2

Add proposed LCO 3.8.3

A02

LCO 3.8.3 3.8.1.2 ~~As a minimum, the following A.C. electrical power sources shall be OPERABLE:~~

a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and

b. One diesel generator set with:

1. Engine-mounted fuel tanks containing a minimum of 152 gallons of fuel,

SR 3.8.3.1 2. A fuel storage system containing a minimum of ~~19,000 gallons~~ of fuel, and LA01

a 7 day supply

3. A fuel transfer pump.

See ITS 3.8.2

A02

Applicability **APPLICABILITY**: ~~MODES 5 and 6~~.

When associated DG is required to be OPERABLE

A03

Add proposed ACTIONS Note

ACTIONS **ACTION**:

Add proposed ACTION A

L01

Add proposed ACTIONS C and D

L02

NOTE

Enter the ACTION of LCO 3.8.2.2, "A.C. Distribution - Shutdown," with one required train de-energized as a result of inoperable offsite circuit.

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or boron concentration, movement of irradiated fuel, or crane operation with loads over the fuel storage pool. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the top of irradiated fuel assemblies seated within the reactor vessel, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

See ITS 3.8.2

SURVEILLANCE REQUIREMENTS

4.8.1.2.1 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1 and 4.8.1.1.2 except for requirement 4.8.1.1.2a.5.

See ITS 3.8.2

Add proposed ACTIONS B and E

M01

M01

L01

Add proposed ACTION F

L02

ITS

A01

ITS 3.8.3

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

See ITS 3.8.1

Add proposed LCO 3.8.3

A02

LCO 3.8.3 3.8.1.1 ~~As a minimum, the following A.C. electrical power sources shall be OPERABLE:~~

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generators, each with:

1. Two separate engine-mounted fuel tanks containing a minimum volume of 238 gallons of fuel each,

LA01

SR 3.8.3.1 2. A separate fuel storage system containing a minimum volume of ~~42,500 gallons~~ of fuel, and

≥ a 7 day supply

3. A separate fuel transfer pump.

See ITS 3.8.1

A02

Applicability **APPLICABILITY**: ~~MODES 1, 2, 3, and 4~~.

When associated DG is required to be OPERABLE

A03

ACTIONS **ACTION**:

Add proposed ACTIONS Note

Add proposed ACTION A

L01

Add proposed ACTIONS C and D

L02

a. With one offsite circuit of 3.8.1.1.a inoperable, except as provided in ACTION f below:

1. Demonstrate the OPERABILITY of the remaining A. C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter.

2. Within 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s), declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.

3. Restore the offsite circuit to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

4. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.8.1

Add proposed ACTIONS B and E

M01

Add proposed ACTION F

M01

L01

L02

See ITS 3.8.1

ELECTRICAL POWER SYSTEMS

ACTION: (Continued)

d. With two of the required offsite A.C. circuits inoperable:

1. Within 12 hours from discovery of two offsite circuits inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) inoperable when its redundant required feature(s) is inoperable.

2. Restore one of the inoperable offsite sources to OPERABLE status within 24 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours.

3. Following restoration of one offsite source, follow ACTION a with the time requirement of that ACTION based on the time of the initial loss of the remaining inoperable offsite A.C. circuit.

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in the at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Following restoration of one diesel generator unit, follow ACTION Statement b. with the time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable diesel generator.

f. With one Unit 2 startup transformer (2A or 2B) inoperable and with a Unit 1 startup transformer (1A or 1B) connected to the same A or B offsite power circuit and administratively available to both units, then should Unit 1 require the use of the startup transformer administratively available to both units, Unit 2 shall demonstrate the operability of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. Restore the inoperable startup transformer to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

g. LCO 3.0.4.b is not applicable to diesel generators.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments, indicated power availability; and

b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

SR 3.8.3.1 a. In accordance with the Surveillance Frequency Control Program by:

See ITS 3.8.1

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying fuel level in the engine-mounted fuel tank,

See ITS 3.8.1

SR 3.8.3.1 2. Verifying the fuel level in the fuel storage tank,

3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the engine-mounted tank,

4. Verifying the diesel starts from ambient condition and accelerates to approximately 900 rpm in less than or equal to 10 seconds**. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the start signal**. The diesel generator shall be started for this test by using one of the following signals:

   a) Manual/Local.

   b) Simulated loss-of-offsite power by itself.

   c) Simulated loss-of-offsite power in conjunction with an ESF actuation test signal.

   d) An ESF actuation test signal by itself.

5. Verifying the generator is synchronized, loaded to greater than or equal to 3685 kW in accordance with the manufacturer's recommendations, and operates within a load band of 3450 to 3685 kW*** for at least an additional 60 minutes, and

6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

SR 3.8.3.5 b. ~~By removing~~ Check for and remove accumulated water:

See ITS 3.8.1

1. From the engine-mounted fuel tank in accordance with the Surveillance Frequency Control Program and after each occasion when the diesel is operated for greater than 1 hour, and

SR 3.8.3.5 2. From ~~the~~ each fuel oil storage tank in accordance with the Surveillance Frequency Control Program.

See ITS 3.8.1

** The diesel generator start (10 sec.) from ambient conditions shall be performed in accordance with the Surveillance Frequency Control Program in these surveillance tests. All other diesel generator starts for purposes of this surveillance testing may be preceded by an engine prelube period and may also include warmup procedures (e.g., gradual acceleration) as recommended by the manufacturer so that mechanical stress and wear on the diesel generator is minimized.

*** The indicated load band is meant as guidance to avoid routine overloading. Variations in loads in excess of the band due to changing bus loads shall not invalidate this test.

Add proposed SR 3.8.3.2

M01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.3.3

c. Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.

d. DELETED

e. In accordance with the Surveillance Frequency Control Program by:

1. DELETED

2.

NOTE

Credit may be taken for unplanned events that satisfy this SR.

Verifying generator capability to reject the single largest post-accident load while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz.

3.

NOTE

Credit may be taken for unplanned events that satisfy this SR.

Verifying the generator capability to reject a load of 3685 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection.

See ITS 3.8.1

Add proposed SR 3.8.3.4

M01

A01

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.3

LCO 3.8.3 3.8.1.2 ~~As a minimum, the following A.C. electrical power sources shall be OPERABLE:~~ A02

a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and

b. One diesel generator with:

1. Two engine-mounted fuel tanks containing a minimum volume of 238 gallons of fuel,

SR 3.8.3.1 2. A fuel storage system containing a minimum volume of ~~42,500 gallons~~ of fuel, and

≥ a 7 day supply

See ITS 3.8.2 LA01

3. A fuel transfer pump.

See ITS 3.8.2

Applicability **APPLICABILITY**: ~~MODES 5 and 6~~. When associated DG is required to be OPERABLE A02

A03

ACTIONS **ACTION**:

Add proposed ACTIONS Note

Add proposed ACTION A L01

Add proposed ACTIONS C and D L02

NOTE

Enter the ACTION of LCO 3.8.3.2, "Onsite Power Distribution - Shutdown," with one required train de-energized as a result of inoperable offsite circuit.

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or boron concentration, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through a greater than or equal to 3.58 square inch vent. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

See ITS 3.8.2

SURVEILLANCE REQUIREMENTS

4.8.1.2.1 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1 and 4.8.1.1.2 (except for requirement 4.8.1.1.2a.5).

Add proposed ACTIONS B and E M01

Add proposed ACTION F M01 L01 L02

DISCUSSION OF CHANGES
ITS 3.8.3, DIESEL FUEL OIL, LUBE OIL, AND STARTING AIR

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS LCOs 3.8.1.1 and 3.8.1.2 state the requirements for the AC Sources during operating and shutdown conditions, respectively. These requirements are used to form the LCO and Applicability for the ITS diesel fuel oil Specification. ITS LCO 3.8.3, "Diesel Fuel Oil, Lube Oil, and Starting Air," states that the stored diesel fuel oil, lube oil, and starting air subsystem shall be within limits for each required DG. The Applicability for this requirement is when the associated DG is required to be OPERABLE. This changes the CTS by combining the requirements for diesel fuel oil and diesel lube oil and starting air subsystem into one Specification.

This change is acceptable because the current requirements are translated into ITS form with no technical changes. The additional requirements for DG lube oil and starting air subsystem are discussed in DOC M01. Diesel fuel oil, lube oil and starting air subsystem are a support system for each DG. The CTS and ITS maintain this relationship between the DGs and the Diesel Fuel Oil System, DG Lube oil System and Starting Air Subsystem. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 CTS 3.8.1.1 and 3.8.1.2 Actions, in part, provide requirements to be taken for each inoperable DG. ITS 3.8.3 ACTIONS include an explicit Note that states, "Separate Condition entry is allowed for each DG." This Note provides instructions for the proper application of the ACTIONS for ITS compliance. This changes the CTS by providing explicit direction for using the ACTIONS when diesel fuel oil and diesel lube oil and starting air subsystem parameters for a DG are not within limits.

This change is acceptable because the addition of the Note reflects the CTS allowance to take appropriate Actions for each DG. This change is designated as administrative since it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 The CTS does not provide any requirements for DG lube oil or starting air pressure. ITS LCO 3.8.3, in part, requires lube oil and starting air to be within limits for each required DG with associated Required Actions and Completion times when outside these limits. ITS SR 3.8.3.2 requires verification that the lube oil inventory is ≥ a 7-day supply for each DG. ITS SR 3.8.3.4 requires verification that required air start receiver bank pressure is ≥ 135 psig for each Unit 1 DG and

≥ 129 psig for each Unit 2 DG. ITS 3.8.3 ACTIONS B and E provide Required Actions if the required DG lube oil inventory is not within limits or the required starting air receiver bank pressure is not within limits respectively. This changes the CTS by adding limits for lube oil inventory and starting air, which Surveillance Requirements to verify the limits are being maintained and explicit ACTIONS for when the limits are not met.

The purpose of ITS 3.8.3 is to provide appropriate limits, ACTIONS, and Surveillances for diesel fuel oil, lube oil, and the air start subsystems because these subsystems support the operation of the standby AC power sources (DGs). The purpose of ITS SR 3.8.3.2 is to provide the appropriate limits for stored lube oil volume. ITS 3.8.3 ACTION B provides an explicit Required Action and Completion Time for restoring stored lube oil volume to within limits. The purpose of ITS SR 3.8.3.4 is to provide the appropriate limits for the DG starting air subsystem. ITS 3.8.3 ACTIONS E provides explicit Required Action and Completion Time for restoring starting air pressures to within limits. If a Required Action and associated Completion Time is not met or one or more DGs with lube oil inventory or required starting air receiver bank pressure not within limits for reasons other than addressed by Conditions B or E, ITS 3.8.3 ACTION F requires the associated DG to be declared inoperable immediately. This change is designated as more restrictive because explicit requirements are included in the Technical Specifications for lube oil inventory and starting air subsystems.

M02 **Unit 1 only:** CTS 3.8.1.1.b.2 and 3.8.1.2.b.2 require, for each DG set, the fuel oil storage system to contain a minimum of 19,000 gallons of fuel oil. ITS SR 3.8.3.1 requires a combined fuel inventory in the fuel oil storage tanks of ≥ a 7 day supply (See LA01 for discussion of relocating fuel oil volume value to the ITS Bases). The ITS Bases for SR 3.8.3.1 indicates that the fuel oil volume equivalent to a 7 day supply is 38,000 gallons. This changes the CTS by requiring more fuel oil volume be available to a DG to ensure at least 7 days of fuel oil is available to a DG.

The purpose of the ISTS minimum fuel oil storage requirement is to ensure that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for 7 days at post accident load conditions. PSL Unit 1 is designed and licensed with a combined fuel oil storage inventory between two storage tanks to ensure one DG can operate for 7 days at post accident load conditions. These two fuel oil storage tanks are designed to supply each DG. Excess fuel oil in the Unit 2 fuel oil storage tanks can also be provided to support the Unit 1 DGs via a fuel transfer crosstie line between the unit’s storage tanks. A fuel oil level of 38,000 gallons is calculated in accordance with Regulatory Guide 1.137 and ANSI N195-1976 and takes into consideration a consumption of 36,107 gallons (7 days post-accident minus the usable day tank inventory), unusable storage tank volume, and assumed instrument tolerance.

This change is designated as more restrictive because the minimum fuel oil storage volume required to be maintained for a DG is increased from the value in CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.1.1.b.2 and CTS 3.8.1.2.b.2 require a separate fuel storage system containing a minimum volume of 19,000 gallons of fuel in each fuel storage tank for Unit 1 and 42,500 gallons in each fuel storage tank for Unit 2. Unit 1 ITS SR 3.8.3.1 requires verifying a combined fuel inventory in the fuel oil storage tanks is ≥ a 7-day supply (38,000 gals) when the diesel generator sets are required to be OPERABLE (See Discussion of Change M02 for change to fuel oil volume). Unit 2 ITS SR 3.8.3.1 requires, in part, verifying that each fuel oil storage tank contains ≥ a 7-day supply of fuel oil (42,500 gals) when the associated diesel generator is required to be OPERABLE. This changes the CTS by moving the specific values for the fuel oil inventory to the Bases and clarifying the Unit 1 fuel storage requirement to meet the 7 day criteria.

The removal of these details from the Technical Specifications is acceptable because this type of information is not necessary to provide adequate protection of public health and safety. The purpose of CTS 3.8.1.1.b.2 and CTS 3.8.1.2.b.2 is to ensure that the DGs have sufficient fuel oil to perform their safety function when the DGs are required to be OPERABLE. ITS SR 3.8.3.1 will continue to ensure that sufficient fuel is contained in the fuel oil storage system for the DGs to perform their intended safety function when the DGs are required to be OPERABLE. In addition, this change is acceptable because these type of details will be adequately controlled in the Technical Specification Bases. Changes to the Bases are controlled by the Technical Specification Control Program in Chapter 5. The program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as less restrictive removal of detail change because details are being moved from the Technical Specifications to the ITS Bases

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.8.1.1 and CTS 3.8.1.2 do not provide explicit compensatory actions if the volume of fuel oil in a storage tank is less than the specified limit. Thus, if the minimum required volume is not met, the associated DG must be declared inoperable and the actions of CTS 3.8.1.1 or CTS 3.8.1.2 must be entered, as appropriate. ITS 3.8.3 ACTION A allows for not declaring the associated DG inoperable as long as the volume of stored fuel oil is greater than a 6 day supply. ITS 3.8.3 Required Action A.1 allows 48 hours to restore the fuel oil volume to within limits. If this Required Action and associated Completion Time is not met or if the fuel oil storage tank volume is < a 6-day supply, the associated DG(s) must be declared inoperable immediately, as required by ITS 3.8.3 ACTION F. For Unit 1, this would require declaring both DGs inoperable because the Unit 1 DGs rely on a combined fuel oil inventory volume in the fuel oil storage tanks (See Discussion of Change

M02). This changes the CTS by allowing the DGs to not be declared inoperable with the fuel oil less than a 7-day supply as long as the associated DG(s) has enough fuel oil for 6 days of operation at post accident load.

The purpose of ITS 3.8.3 ACTION A is to allow time to restore the stored diesel fuel oil volume to within the specified limit for a given DG. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to a degraded condition in order to minimize risk associated with continued operation while providing time to restore inventory. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features including the capacity and capability of remaining systems or features, reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. The addition of ITS 3.8.3 ACTION A will allow each DG to not be declared inoperable with the associated stored diesel fuel oil volume not within the specified Surveillance limit as long as the DG has enough fuel oil for 6 days of operation at post accident load. In this Condition, the 7 day fuel oil supply for the DG is not available. However, the Condition is restricted to fuel oil volume that maintains at least a 6 day supply. These circumstances may be caused by events such as full load operation required after an inadvertent start while at minimum required fuel oil level, or feed and bleed operations, which may be necessary due to increasing particulate levels or any number of other oil quality degradations. This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required volume prior to declaring the associated DG(s) inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period. This change is designated as less restrictive since less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 4.8.1.1.2.c requires, in part, to verify fuel oil properties of new and stored fuel oil are tested in accordance with and maintained within limits specified in the Diesel Fuel Oil Testing Program. CTS 6.8.4.n provides requirements for new fuel oil properties and fuel oil total particulates. CTS 3.8.1.1 and CTS 3.8.1.2 do not provide explicit compensatory actions if the new fuel oil properties or fuel oil total particulates are not within the limits specified in the Diesel Fuel Oil Testing Program. Thus, if the fuel oil properties are not met, the associated DG must be declared inoperable and the actions of CTS 3.8.1.1 or CTS 3.8.1.2 must be entered, as appropriate. ITS SR 3.8.3.3 also requires verification that new and stored fuel oil properties are tested and maintained within limits, as specified in the Diesel Fuel Oil Testing Program. This includes a stored fuel oil total particulate limit and new fuel oil properties. ITS 3.8.3 ACTION C specifies the compensatory actions for one or more DGs with stored fuel oil total particulates not within limits. ITS 3.8.3 ACTION D specifies the compensatory actions for one or more DGs with new fuel oil properties not within limits. If a Required Action and associated Completion Time is not met or one or more DGs with new and stored fuel oil properties not within limits for reasons other than addressed by Conditions C or D, ITS 3.8.3 ACTION F requires the associated DG to be declared inoperable immediately. This changes the CTS by allowing the DGs to not be declared inoperable with fuel oil total particulates or new fuel oil properties not within the specified Surveillance limits unless the applicable ITS 3.8.3 ACTIONS cannot be completed within the required Completion Time.

The purpose of CTS 4.8.1.1.2.c (ITS SR 3.8.3.3) is to provide the appropriate limits for stored and new fuel oil properties. ITS 3.8.3 ACTIONS C and D provide explicit Required Actions and Completion Times for restoring both total particulates and stored fuel oil properties (affected by the addition of new fuel oil whose properties are not within limits) to within limits. ITS 3.8.3 ACTION C is entered when the acceptance criterion of total particulate concentration specified in ITS 5.5.10 is not met. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures, contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not necessarily result in a failure of the fuel oil to burn properly in the diesel engine, particulate concentration is unlikely to change significantly between Surveillance Frequency intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, re-sampling and re-analysis of the DG fuel oil. ITS 3.8.3 ACTION D is entered because of failure to meet the requirements specified in ITS 5.5.10.b. With the new fuel oil properties defined in the Bases for ITS SR 3.8.3.3 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil did not cause the stored fuel oil to be outside of the required limits, or to restore the stored fuel oil properties to within limits. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the stored fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function. ITS 3.8.3 ACTION F covers the condition when a Required Action and associated Completion Time of any ITS 3.8.3 ACTIONS could not be met, or if one or more DGs with diesel fuel oil, lube oil, or starting air subsystem is not within limits for reasons other than Condition A, B, C, D, or E. The allowances are considered acceptable since a relatively short time is allowed to exist with DG parameters not within limits

This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a design basis accident occurring during the repair period. The fuel oil properties must be restored within limits within 30 days and the fuel oil total particulates must be stored in 7 days. In this condition, the DG fuel oil is degraded but remains capable of supporting the DG OPERABILITY. The ITS requirements are consistent with the ISTS wording for these requirements. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

3.8.1.1
3.8.1.2 LCO 3.8.3 The stored diesel fuel oil, lube oil, and starting air subsystem shall be within limits for each required diesel generator (DG).

Applicability APPLICABILITY: When associated DG is required to be OPERABLE.

ACTIONS

--NOTE--

DOC A03 Separate Condition entry is allowed for each DG.

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 A. One or more DGs with ~~fuel level~~ combined fuel oil inventory less than a ~~[~~7~~]~~ day supply and greater than a ~~[~~6~~]~~ day supply in storage tanks.	A.1 Restore fuel oil level to within limits.	48 hours ① ②
DOC M01 B. One or more DGs with lube oil inventory less than a ~~[~~7~~]~~ day supply and greater than a ~~[~~6~~]~~ day supply.	B.1 Restore lube oil inventory to within limits.	48 hours ①
DOC L02 C. One or more DGs with stored fuel oil total particulates not within limits.	C.1 Restore fuel oil total particulates to within limits.	7 days
DOC L02 D. One or more DGs with new fuel oil properties not within limits.	D.1 Restore stored fuel oil properties to within limits.	30 days

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M01	E. One or more DGs with required starting air receiver bank pressure < 135 ~~[225]~~ psig and ≥ 85 ~~[125]~~ psig.	E.1 Restore starting air receiver pressure to ≥ 135 ~~[225]~~ psig.	48 hours	② ①
DOC M01 DOC L01 DOC L02	F. Required Action and associated Completion Time not met. <u>OR</u> One or more DGs with diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than Condition A, B, C, D, or E.	F.1 Declare associated DG inoperable.	Immediately	

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
4.8.1.1.2.a.2 3.8.1.1.b.2 3.8.1.2.b.2 DOC M02	SR 3.8.3.1 Verify ~~each~~ combined fuel inventory in fuel oil storage tanks is ~~contains~~ ≥ a ~~[~~7~~]~~ day supply ~~of fuel~~.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ①

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
DOC M01	SR 3.8.3.2	Verify lubricating oil inventory is ≥ a ~~[~~7~~]~~ day supply.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	①
4.8.1.1.2.c	SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program	
DOC M01	SR 3.8.3.4	Verify each DG required air start receiver bank pressure is ≥ ~~[225]~~ 135 psig.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	② ①
4.8.1.1.2.b.2	SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	①

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

3.8.1.1
3.8.1.2 LCO 3.8.3 The stored diesel fuel oil, lube oil, and starting air subsystem shall be within limits for each required diesel generator (DG).

Applicability APPLICABILITY: When associated DG is required to be OPERABLE.

ACTIONS

---NOTE---

DOC A03 Separate Condition entry is allowed for each DG.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L01	A. One or more DGs with fuel level less than a ~~[~~7~~]~~ day supply and greater than a ~~[~~6~~]~~ day supply in storage tank.	A.1 Restore fuel oil level to within limits.	48 hours	①
DOC M01	B. One or more DGs with lube oil inventory less than a ~~[~~7~~]~~ day supply and greater than a ~~[~~6~~]~~ day supply.	B.1 Restore lube oil inventory to within limits.	48 hours	①
DOC L02	C. One or more DGs with stored fuel oil total particulates not within limits.	C.1 Restore fuel oil total particulates to within limits.	7 days	
DOC L02	D. One or more DGs with new fuel oil properties not within limits.	D.1 Restore stored fuel oil properties to within limits.	30 days	

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M01	E. One or more DGs with required starting air receiver bank pressure < ~~[225]~~ 129 psig and ≥ ~~[125]~~ 85 psig.	E.1 Restore starting air receiver pressure to ≥ ~~[225]~~ 129 psig.	48 hours	② ①
DOC M01 DOC L01 DOC L02	F. Required Action and associated Completion Time not met. OR One or more DGs with diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than Condition A, B, C, D, or E.	F.1 Declare associated DG inoperable.	Immediately	

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.8.1.1.2.a.2 3.8.1.1.b.2 3.8.1.2.b.2	SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ a ~~[~~7~~]~~ day supply of fuel.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	①

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
DOC M01	SR 3.8.3.2	Verify lubricating oil inventory is ≥ a ~~[~~7~~]~~ day supply.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	①
4.8.1.1.2.c	SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program	
DOC M01	SR 3.8.3.4	Verify each DG required air start receiver bank pressure is ≥ ~~[225]~~ 129 psig.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ①
4.8.1.1.2.b.2	SR 3.8.3.5	Check for and remove accumulated water from each fuel oil storage tank.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	①

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.3, DIESEL FUEL OIL, LUBE OIL, AND STARTING AIR

1. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

2. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

BASES

BACKGROUND

~~Each diesel generator (DG) is~~ provided with a ~~storage tank~~ having a fuel oil capacity sufficient to operate ~~that diesel~~ for a period of [7] days, while the DG is supplying ~~maximum~~ post loss of coolant accident load demand as discussed in the FSAR, Section [9.5.4.2] (Ref. 1) [and Regulatory Guide 1.137 (Ref. 2)]. The ~~maximum~~ load demand is calculated using the assumption that ~~at least two~~ DG~~s~~ ~~are~~ available. This onsite fuel oil capacity is sufficient to operate the DG~~s~~ for longer than the time to replenish the onsite supply from outside sources.

The diesel generators (DGs) are

fuel supply system

one DG

profile

U

Each DG consists of two tandem diesel engines and a generator.

one

is

Insert 1

post accident

① ② ①

Fuel oil is transferred from storage tank to day tank by ~~either of two~~ transfer pump~~s~~ associated with each storage tank. Redundancy of pumps and piping precludes the failure of one pump, or the rupture of any pipe, valve, or tank to result in the loss of more than one DG. All ~~outside tanks, pumps, and piping are~~ located underground.

The fuel oil storage system consists of two subsystems with each subsystem consisting of a fuel oil storage tank, transfer pump, two day tanks, interconnecting piping and valves.

a

Cross connection piping is provided with locked closed valves for transferring fuel oil between the redundant subsystems.

fuel oil piping, with the exception of the suction and discharge cross-tie lines, is routed through enclosed buildings or

The fuel oil storage tanks are located on an outdoor platform.

①

For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. Regulatory Guide 1.137 (Ref. 2) addresses the recommended fuel oil practices as supplemented by ANSI N195-1976 (Ref. 3). The fuel oil properties governed by these SRs are the water and sediment content, the kinematic viscosity, specific gravity (or API gravity), and impurity level.

The DG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated DG ~~under all~~ loading conditions. The system is required to circulate the lube oil to the ~~diesel engine~~ working surfaces and to remove excess heat generated by friction during operation. Each engine oil sump contains an inventory capable of supporting ~~a minimum of [7] days of~~ operation. [The onsite storage in addition to ~~the~~ engine oil sump is sufficient to ensure [7] days of continuous operation.] This supply is sufficient ~~supply~~ to allow the operator to replenish lube oil from outside sources.

engines under post accident

of the diesel engines

each

① ② ③

Each DG has an air start system with adequate capacity for five ~~successive~~ start ~~attempts~~ on the DG without recharging the air start receiver(s).

two redundant subsystems each with

cold

s

per air start receiver bank

One DG air start subsystem supplies air simultaneously to air start motors of both tandem diesel engines during a DG start.

①

St. Lucie – Unit 1

①

①

INSERT 1

Sufficient onsite fuel oil storage is provided to support 7 days of DG operation for one DG at post accident load conditions. Onsite fuel oil storage inventory includes the volume of both Unit 1 fuel oil storage tanks and excess fuel in the Unit 2 fuel oil storage tanks. Fuel oil transfer capability is provided between the storage tanks to ensure at least one DG has a 7-day supply of fuel.

BASES

APPLICABLE SAFETY ANALYSES

U

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter ~~[~~6~~]~~ (Ref. 4), and in the FSAR, Chapter ~~[~~15~~]~~ (Ref. 5), assume Engineered Safety Feature (ESF) systems are OPERABLE. The DGs are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that fuel, Reactor Coolant System and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for LCO Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems. ② ①

Since diesel fuel oil, lube oil, and the air start subsystems support the operation of the standby AC power sources, they satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

onsite

at post accident

The design capacity of a single fuel oil storage tank does not support 7 days of DG operation at post accident load conditions. However, there is adequate onsite supply for 7 days of DG operation. Sufficient onsite fuel oil storage inventory to support 7 days of DG operation includes the combined volume from both Unit 1 fuel oil storage tanks and excess fuel in the Unit 2 fuel oil storage tanks. Fuel oil transfer capability must be available from each required tank to support a combined 7 day supply to a DG.

Stored diesel fuel oil is required to have sufficient supply for ~~[~~7~~]~~ days ~~of full~~ load operation. ~~It is~~ also required to meet specific standards for quality. Additionally, sufficient lubricating oil supply must be available to ensure the capability to operate at full load for ~~[~~7~~]~~ days. This requirement, in conjunction with an ability to obtain replacement supplies within ~~[~~7~~]~~ days, supports the availability of DGs required to shut down the reactor and to maintain it in a safe condition for an anticipated operational occurrence (AOO) or a postulated DBA with loss of offsite power. DG day tank fuel requirements, as well as transfer capability from the storage tank to the day tank, are addressed in LCO 3.8.1, "AC Sources - Operating," and LCO 3.8.2, "AC Sources - Shutdown." ⑤ ② ①

cold s

The starting air system is required to have a minimum capacity for five ~~successive~~ DG start ~~attempts~~ without recharging the air start receivers. s ①

APPLICABILITY

The AC sources (LCO 3.8.1 and LCO 3.8.2) are required to ensure the availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Since stored diesel fuel oil, lube oil, and starting air subsystems support LCO 3.8.1 and LCO 3.8.2, stored diesel fuel oil, lube oil and starting air are required to be within limits when the associated DG is required to be OPERABLE.

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each DG. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable DG subsystem. Complying with the Required Actions for one inoperable DG subsystem may allow for continued operation, and subsequent inoperable DG subsystem(s) are governed by separate Condition entry and application of associated Required Actions.

BASES

ACTIONS (continued)

A.1

a

combined fuel oil inventory in the fuel oil storage tanks

to support either DG

volume

32,572

⑤ ②

In this Condition, ~~the~~ ~~[~~7~~]~~ day ~~fuel oil supply~~ for a DG is not available. However, the Condition is restricted to fuel oil level reductions, that maintain at least a ~~[~~6~~]~~ day ~~supply~~. The fuel oil ~~level~~ equivalent to a ~~[~~6~~]~~ day supply is ~~[28,285]~~ gallons. These circumstances may be caused by events such as full load operation required after an inadvertent start while at minimum required level; or feed and bleed operations, which may be necessitated by increasing particulate levels or any number of other oil quality degradations. This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring the DG inoperable. This period is acceptable based on the remaining

combined onsite fuel oil storage tank inventory

~~capacity~~ (≥ ~~[~~6~~]~~ days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period. ② ①

If the combined fuel oil inventory in the fuel oil storage tanks is < 6 days or a combined inventory of 7 days is not restored within 48 hours, both DGs must be declared inoperable per Required Action F.1. ⑤

B.1

onsite (500 gallons)

post accident

428

① ②

In this Condition, the ~~[~~7~~]~~ day lube oil inventory i.e., sufficient lubricating oil to support ~~[~~7~~]~~ days of continuous DG operation at ~~full~~ load conditions is not available. However, the Condition is restricted to lube oil volume reductions that maintain at least a ~~[~~6~~]~~ day supply. The lube oil inventory equivalent to a ~~[~~6~~]~~ day supply is ~~[425]~~ gallons. This restriction allows sufficient time to obtain the requisite replacement volume. A period of 48 hours is considered sufficient to complete restoration of the required volume prior to declaring the DG inoperable. This period is acceptable based on the remaining capacity (> ~~[~~6~~]~~ days), the low rate of usage, the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

C.1

This Condition is entered as a result of a failure to meet the acceptance criterion of SR 3.8.3.5. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not mean failure of the fuel oil to burn properly in the diesel engine, and particulate concentration is unlikely to change

BASES

ACTIONS (continued)

significantly between Surveillance Frequency intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, resampling, and re-analysis of the DG fuel oil.

D.1

With the new fuel oil properties defined in the Bases for SR 3.8.3.4 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

E.1

With required starting air receiver pressure < 135 ~~[225]~~ psig, sufficient capacity for five successive DG start attempts does not exist. However, as long as the receiver pressure is > 85 ~~[125]~~ psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period. ① ②

F.1

With a Required Action and associated Completion Time not met, or one or more DGs with diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through E, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

post accident load conditions. Implicit in this SR is the requirement to verify the capability to transfer the fuel oil from the other onsite storage tanks to the DG day tank

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

volume

one

combined onsite

38,000

The calculated value takes into consideration a consumption of 36,107 gallons (7 days post-accident minus the usable day tank inventory), unusable storage tank volume, and assumed instrument tolerance.

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support ~~each~~ DG's operation for ~~[~~7~~]~~ days at ~~full load~~. The fuel oil ~~level~~ equivalent to a ~~[~~7~~]~~ day supply is ~~[33,000]~~ gallons when calculated in accordance with References 2 and 3. The required fuel storage volume is determined using the most limiting energy content of the stored fuel. Using the known correlation of diesel fuel oil absolute specific gravity or API gravity to energy content, the required diesel generator output, and the corresponding fuel consumption rate, the onsite fuel storage volume required for ~~[~~7~~]~~ days of operation can be determined. SR 3.8.3.3 requires new fuel to be tested to verify that the absolute specific gravity or API gravity is within the range assumed in the diesel fuel oil consumption calculations. The ~~[~~7~~]~~ day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location. ② ① ⑤ ② ②

~~[The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

SR 3.8.3.2

onsite

post accident

sumps do

This Surveillance ensures that sufficient lube oil inventory is available to support at least ~~[~~7~~]~~ days of ~~full~~ load operation for each DG. The lube oil inventory equivalent to a ~~[~~7~~]~~ day supply is ~~[~~500~~]~~ gallons and is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil ~~sump does~~ not hold adequate inventory for ~~[~~7~~]~~ days of full load operation without the level reaching the manufacturer recommended minimum level. ① ② ① ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

81
a. Sample the new fuel oil in accordance with ASTM D4057-~~[ ]~~ (Ref. 6), ②

06
b. Verify in accordance with the tests specified in ASTM D975-~~[ ]~~ (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89, or an API gravity at 60°F of ≥ 27° and ≤ 39° when
99
tested in accordance with ASTM D1298-~~[ ]~~ (Ref. 6), a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point ≥ 125°F, and ②

c. Verify that the new fuel oil has a clear and bright appearance with
82
proper color when tested in accordance with ASTM D4176-~~[ ]~~ or a water and sediment content within limits when tested in accordance
96
with ~~[~~ASTM D2709-~~[ ]]~~ (Ref. 6). ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks.

06
06
5453
3120
82

Within 31 days following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975-~~[~~ ~~]~~ (Ref. 7) are met for new fuel oil when tested in accordance with ASTM D975-~~[~~ ~~]~~ (Ref. 6), except that the analysis for sulfur may be performed in accordance with ASTM D~~1552-[~~ ~~]~~, ASTM D2622-~~[~~ ~~]~~, or ASTM D~~4294-[ ] (Ref. 6)~~. The 31 day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on DG operation. This Surveillance ensures the availability of high quality fuel oil for the DGs.

② ①

Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure.

6217 or D2276
Each tank of the
when
is

Particulate concentrations should be determined in accordance with ASTM D~~5452-[ ] (Ref. 6)~~. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. ~~[For those designs in which the~~ total stored fuel oil volume ~~is~~ contained in two or more interconnected tanks~~, each tank must be~~ considered and tested separately.~~]~~

① ②

The Frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Frequency intervals.

SR 3.8.3.4

cold
of both tandem diesel engines
s
cold

This Surveillance ensures that, without the aid of the refill compressor, sufficient air start capacity for each DG is available. The system design requirements provide for a minimum of ~~[~~five~~] engine~~ start ~~cycles~~ without recharging. ~~[A start cycle is defined by the DG vendor, but usually is measured in terms of time (seconds or cranking) or engine cranking speed.]~~ The pressure specified in this SR is intended to reflect the lowest value at which the ~~[~~five~~]~~ starts can be accomplished.

① ② ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

SR 3.8.3.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel storage tanks eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, and contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~[The Surveillance Frequency of 31 days is established by Regulatory Guide 1.137 (Ref. 2). This SR is for preventative maintenance.~~ ②

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~------------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ④ ②

The presence of water does not necessarily represent failure of this SR provided the accumulated water is removed during performance of the Surveillance.

REFERENCES

1. U FSAR, Section ~~[~~9.5.4.2~~]~~. ① ②

2. Regulatory Guide 1.137.

3. ANSI N195, 1976.

4. U FSAR, Chapter ~~[~~6~~]~~.

5. U FSAR, Chapter ~~[~~15~~]~~.

6. ASTM Standards: D4057-~~[~~81~~]~~; D975-~~[~~06~~]~~; D1298-~~[~~99~~]~~; D4176-~~[~~82~~]~~; ~~[~~D2709-~~[ ];]~~ ~~D1552-[ ]~~; D2622-~~[~~82~~]~~; D~~4294-[~~6217~~]~~; D545~~2-[~~3~~]~~; D3120; D2276-83. ① ②

7. ASTM Standards, D975-~~[~~06~~]~~, Table 1.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

BASES

and two day tanks

BACKGROUND

Each diesel generator (DG) is provided with a storage tank having a fuel oil capacity sufficient to operate that diesel for a period of [7] days, while the DG is supplying ~~maximum~~ post ~~loss of coolant~~ accident load demand as discussed in the FSAR, Section [9.5.4.2] (Ref. 1) [and Regulatory Guide 1.137 (Ref. 2)]. The ~~maximum~~ load demand is calculated using the assumption that ~~at least two~~ DG~~s~~ ~~are~~ available. This onsite fuel oil capacity is sufficient to operate the DG~~s~~ for longer than the time to replenish the onsite supply from outside sources. ① ② ①

profile

U

profile

A DG consists of two tandem diesel engines and a generator.

one

is

post accident

Fuel oil is transferred from storage tank to day tank by ~~either of two~~ transfer pump~~s~~ associated with each storage tank. Redundancy of pumps and piping precludes the failure of one pump, or the rupture of any pipe, valve, or tank to result in the loss of more than one DG. All ~~outside tanks, pumps, and piping are~~ located underground. ①

a

Cross connection piping is provided with locked closed valves for transferring fuel oil between fuel storage systems.

fuel oil piping is routed through enclosed buildings or

For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. Regulatory Guide 1.137 (Ref. 2) addresses the recommended fuel oil practices as supplemented by ANSI N195-1976 (Ref. 3). The fuel oil properties governed by these SRs are the water and sediment content, the kinematic viscosity, specific gravity (or API gravity), and impurity level.

The DG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated DG ~~under all~~ loading conditions. The system is required to circulate the lube oil to the ~~diesel engine~~ working surfaces and to remove excess heat generated by friction during operation. Each engine oil sump contains an inventory capable of supporting ~~a minimum of [7] days of~~ operation. [The onsite storage in addition to ~~the~~ engine oil sump is sufficient to ensure [7] days of continuous operation.] This supply is sufficient ~~supply~~ to allow the operator to replenish lube oil from outside sources. ① ② ③

engines under post accident

of the diesel engines

each

Each DG has an air start system with adequate capacity for five ~~successive~~ start ~~attempts~~ on the DG without recharging the air start receiver(s). ①

cold

s

per air start receiver bank

The DG air start subsystem supplies air simultaneously to air start motors of both tandem diesel engines during a DG start.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter ~~[~~6~~]~~ (Ref. 4), and in the UFSAR, Chapter ~~[~~15~~]~~ (Ref. 5), assume Engineered Safety Feature (ESF) systems are OPERABLE. The DGs are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that fuel, Reactor Coolant System and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for LCO Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems. ① ②

Since diesel fuel oil, lube oil, and the air start subsystems support the operation of the standby AC power sources, they satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Stored diesel fuel oil is required to have sufficient supply for ~~[~~7~~]~~ days ~~of full~~ at post-accident load operation. It is also required to meet specific standards for quality. Additionally, sufficient lubricating oil supply must be available to ensure the capability to operate at full load for ~~[~~7~~]~~ days. This requirement, in conjunction with an ability to obtain replacement supplies within ~~[~~7~~]~~ days, supports the availability of DGs required to shut down the reactor and to maintain it in a safe condition for an anticipated operational occurrence (AOO) or a postulated DBA with loss of offsite power. DG day tank fuel requirements, as well as transfer capability from the storage tanks to the day tanks, are addressed in LCO 3.8.1, "AC Sources - Operating," and LCO 3.8.2, "AC Sources - Shutdown." ① ② ①

The starting air system is required to have a minimum capacity for five ~~successive~~ cold DG starts ~~attempts~~ without recharging the air start receivers. ①

APPLICABILITY

The AC sources (LCO 3.8.1 and LCO 3.8.2) are required to ensure the availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Since stored diesel fuel oil, lube oil, and starting air subsystems support LCO 3.8.1 and LCO 3.8.2, stored diesel fuel oil, lube oil and starting air are required to be within limits when the associated DG is required to be OPERABLE.

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each DG. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable DG subsystem. Complying with the Required Actions for one inoperable DG subsystem may allow for continued operation, and subsequent inoperable DG subsystem(s) are governed by separate Condition entry and application of associated Required Actions.

ACTIONS (continued)

A.1

In this Condition, the ~~[~~7~~]~~ day fuel oil supply for a DG (42,500) is not available. ① However, the Condition is restricted to fuel oil level reductions, that maintain at least a ~~[~~6~~]~~ day supply. The fuel oil level equivalent to a ~~[~~6~~]~~ day ② supply is ~~[28,285]~~ 36,429 gallons. These circumstances may be caused by events such as full load operation required after an inadvertent start while at minimum required level; or feed and bleed operations, which may be necessitated by increasing particulate levels or any number of other oil quality degradations. This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring the DG inoperable. This period is acceptable based on the remaining capacity (≥ ~~[~~6~~]~~ days), ② the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

B.1

In this Condition, the ~~[~~7~~]~~ day lube oil inventory onsite (500 gallons) i.e., sufficient lubricating oil ① to support ~~[~~7~~]~~ days of continuous DG operation at ~~full~~ post accident load conditions is not available. However, the Condition is restricted to lube oil volume reductions that maintain at least a ~~[~~6~~]~~ day supply. The lube oil inventory equivalent to a ~~[~~6~~]~~ day supply is ~~[425]~~ 428 gallons. ② This restriction allows sufficient time to obtain the requisite replacement volume. A period of 48 hours is considered sufficient to complete restoration of the required volume prior to declaring the DG inoperable. This period is acceptable based on the remaining capacity (> ~~[~~6~~]~~ days), the low rate of usage, the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

C.1

This Condition is entered as a result of a failure to meet the acceptance criterion of SR 3.8.3.5. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not mean failure of the fuel oil to burn properly in the diesel engine, and particulate concentration is unlikely to change

BASES

ACTIONS (continued)

significantly between Surveillance Frequency intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, resampling, and re-analysis of the DG fuel oil.

D.1

With the new fuel oil properties defined in the Bases for SR 3.8.3.4 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

E.1

required 129

With starting air receiver pressure < ~~[225]~~ psig, sufficient capacity for five ②
85 successive DG start attempts does not exist. However, as long as the
receiver pressure is > ~~[125]~~ psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

F.1

With a Required Action and associated Completion Time not met, or one or more DGs with diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through E, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for ~~[~~7~~]~~ days at ~~full load~~ post-accident load conditions. The fuel oil level equivalent to a ~~[~~7~~]~~ day supply is ~~[33,000]~~ 42,500 gallons when calculated in accordance with References 2 and 3. The calculated value takes into consideration a consumption of 40,671 gallons (7 days post-accident minus the usable day tank inventory), unusable storage tank volume, and assumed instrument tolerance. The required fuel storage volume is determined using the most limiting energy content of the stored fuel. Using the known correlation of diesel fuel oil absolute specific gravity or API gravity to energy content, the required diesel generator output, and the corresponding fuel consumption rate, the onsite fuel storage volume required for ~~[~~7~~]~~ days of operation can be determined. SR 3.8.3.3 requires new fuel to be tested to verify that the absolute specific gravity or API gravity is within the range assumed in the diesel fuel oil consumption calculations. The ~~[~~7~~]~~ day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location. ② ① ⑤ ② ②

~~[The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil onsite inventory is available to support at least ~~[~~7~~]~~ days of ~~full~~ post-accident load operation for each DG. The lube oil inventory equivalent to a ~~[~~7~~]~~ day supply is ~~[~~500~~]~~ gallons and is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil ~~sump does~~ sumps do not hold adequate inventory for ~~[~~7~~]~~ days of full load operation without the level reaching the manufacturer recommended minimum level. ① ② ① ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~--]~~ ②

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

a. Sample the new fuel oil in accordance with ASTM D4057-~~[ ]~~81 (Ref. 6), ②

b. Verify in accordance with the tests specified in ASTM D975-~~[ ]~~06 (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89, or an API gravity at 60°F of ≥ 27° and ≤ 39° when tested in accordance with ASTM D1298-~~[ ]~~99 (Ref. 6), a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point ≥ 125°F, and ②

c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176-~~[ ]~~82 or a water and sediment content within limits when tested in accordance with ~~[~~ASTM D2709-~~[ ]~~96~~]~~ (Ref. 6). ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks.

Within 31 days following the initial new fuel oil sample, the fuel oil is
analyzed to establish that the other properties specified in Table 1 of
06 ASTM D975-~~[~~ ~~]~~ (Ref. 7) are met for new fuel oil when tested in
06 accordance with ASTM D975-~~[~~ ~~]~~ (Ref. 6), except that the analysis for
5453 sulfur may be performed in accordance with ASTM D~~1552-[ ]~~, ②
3120 ASTM D2622-~~[~~ ~~]~~, or ASTM D~~4294-[ ] (Ref. 6)~~. The 31 day period is ①
82 acceptable because the fuel oil properties of interest, even if they were
not within stated limits, would not have an immediate effect on DG
operation. This Surveillance ensures the availability of high quality fuel oil
for the DGs.

Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure.

Particulate concentrations should be determined in accordance with ①
6217 or D2276 ASTM D~~5452-[ ] (Ref. 6)~~. This method involves a gravimetric
determination of total particulate concentration in the fuel oil and has a
limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent ②
Each tank of the laboratory testing in lieu of field testing. ~~[For those designs in which the~~
when total stored fuel oil volume ~~is~~ contained in two or more interconnected
tanks~~, each tank must be~~ considered and tested separately.~~]~~
is

The Frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Frequency intervals.

SR 3.8.3.4

This Surveillance ensures that, without the aid of the refill compressor,
sufficient air start capacity for each DG is available. The system design
cold s ①
of both tandem diesel engines requirements provide for a minimum of ~~[~~five~~]~~ ~~engine~~ start ~~cycles~~ without
recharging. ~~[A start cycle is defined by the DG vendor, but usually is~~ ②
~~measured in terms of time (seconds or cranking) or engine cranking~~
~~speed.]~~ The pressure specified in this SR is intended to reflect the lowest ①
value at which the ~~[~~five~~]~~ starts can be accomplished.
cold

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure.~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

SR 3.8.3.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel storage tanks eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, and contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. ~~[The Surveillance Frequency of 31 days is established by Regulatory Guide 1.137 (Ref. 2). This SR is for preventative maintenance.~~ ②

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ④ ②

The presence of water does not necessarily represent failure of this SR provided the accumulated water is removed during performance of the Surveillance.

REFERENCES

1. UFSAR, Section ~~[~~9.5.4.2~~]~~. ① ②
2. Regulatory Guide 1.137.
3. ANSI N195, 1976.
4. UFSAR, Chapter ~~[~~6~~]~~. ① ②
5. UFSAR, Chapter ~~[~~15~~]~~.
6. ASTM Standards: D4057-~~[~~81~~]~~; D975-~~[~~06~~]~~; D1298-~~[~~99~~]~~; D4176-~~[~~82~~]~~; ~~[~~D2709-~~[ ];]~~ ~~D1552-[ ]~~; D2622-~~[~~82~~]~~; D~~4294-[~~6217~~]~~; D545~~2-[~~3~~]~~; D3120; D2276-83.
7. ASTM Standards, D975-~~[~~06~~]~~, Table 1.

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.3 BASES, DIESEL FUEL OIL, LUBE OIL, AND STARTING AIR

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Editorial grammar changes to the Bases have been made to enhance clarity.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Changes are made to clarify the 7 day fuel oil storage volume requirement.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.3, DIESEL FUEL OIL, LUBE OIL AND STARTING AIR

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 4

ITS 3.8.4, DC Sources - Operating

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

ITS

A01

ITS 3.8.4

ELECTRICAL POWER SYSTEMS

SOURCES

D.C. ~~DISTRIBUTION~~ - OPERATING

The Train A and Train B DC electrical power subsystems shall be OPERABLE.

LIMITING CONDITION FOR OPERATION

LCO 3.8.4 3.8.2.3 ~~As a minimum the following D.C. electrical sources shall be OPERABLE:~~

a. 125-volt D.C. bus No. 1A, ~~125-volt Battery bank No. 1A and a full capacity charger.~~

b. 125-volt D.C. bus No. 1B, ~~125-volt Battery bank No. 1B and a full capacity charger.~~

See ITS 3.8.9

LA01

Applicability **APPLICABILITY:** MODES 1, 2, 3 and 4.

ACTION:

See ITS 3.8.9

Action B

Action C

Required Action C.2 NOTE

a. With one of the required battery banks or busses inoperable, restore the inoperable battery bank or bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

Action A

b. With one of the required full capacity chargers inoperable, ~~demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.3.2.a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.~~

Add proposed Required Actions A.1, A.2 and A.3 and Completion Times

L01

M01

See ITS 3.8.9

SURVEILLANCE REQUIREMENTS

4.8.2.3.1 Each D.C. bus train shall be determined OPERABLE and energized in accordance with the Surveillance Frequency Control Program by verifying indicated power availability.

4.8.2.3.2 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

See ITS 3.8.6

SR 3.8.4.1 2. The total battery terminal voltage is greater than or equal to ~~129-volts on float charge~~.

132 V

the minimum established float voltage

LA02

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

b. In accordance with the Surveillance Frequency Control Program and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1. The parameters in Table 4.8-2 meet the Category B limits,

See ITS 3.8.6

2. There is no visible corrosion at either terminals or connectors, and

See ITS 5.5.14

3. The average electrolyte temperature of 10% (60 cells total) of connected cells is above 50°F.

See ITS 3.8.6

c. In accordance with the Surveillance Frequency Control Program by verifying that:

1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,

2. The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material,

See ITS 3.8.6

3. Battery cell inter-connection resistance values are maintained at the values below:

Battery Inter-Connection Measurement Limits		
Battery Inter-Connection Type	Maximum Individual Inter-Connection Resistance	Maximum Average Inter-Connection Resistance [Battery Bank*]
Inter-Cell	≤ 150 x 10-6 ohms	≤ 50 x 10-6 ohms
Inter-Tier	≤ 200 x 10-6 ohms	
Inter-Rack	≤ 200 x 10-6 ohms	
Output Terminal	≤ 150 x 10-6 ohms	

* The battery bank average interconnection resistance limit is the average of all inter-cell, inter-tier, inter-rack and output terminal connection resistance measurements for all series connections in the battery string

and,

SR 3.8.4.2

4. The battery charger will supply at least 300 amperes at 140 volts for at least 6 hours.

Add proposed 2nd option for SR 3.8.4.2

L02

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

Add proposed SR 3.8.4.3 NOTE 2

SR 3.8.4.3

d. In accordance with the Surveillance Frequency Control Program~~, during shutdown~~, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

L03

e. In accordance with the Surveillance Frequency Control Program, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. ~~This~~

See ITS 3.8.6

SR 3.8.4.3 NOTE 1

Modified

performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.3.2.d.

M02

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

See ITS 3.8.6

TABLE 4.8-2

BATTERY SURVEILLANCE REQUIREMENT

	CATEGORY A(1)	**CATEGORY B(2)**	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable(3) value for each connected cell
Electrolyte Level	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(c)	> 2.07 volts
Specific Gravity(a)	≥ 1.195(b)	≥ 1.190 Average of all connected cells > 1.200	Not more than .020 below the average of all connected cells Average of all connected cells ≥ 1.190(b)

See ITS 3.8.6

(a) Corrected for electrolyte temperature and level.

(b) Or battery charging current is less than 2 amps when on charge.

(c) Corrected for average electrolyte temperature.

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within the limits within 7 days.

(3) With any Category B parameter not within its allowable value, declare the battery inoperable.

A01

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

The Train A and Train B DC electrical power subsystems shall be OPERABLE.

LCO 3.8.4 3.8.2.1 ~~As a minimum the following D.C. electrical sources shall be OPERABLE:~~

a. ~~125-volt Battery bank No. 2A and a full capacity charger.~~

b. ~~125-volt Battery bank No. 2B and a full capacity charger.~~

LA01

Applicability **APPLICABILITY:** MODES 1, 2, 3, and 4.

ACTION:

Action B

Action C

Required Action C.2 NOTE

a. With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

Action A

b. With one of the required full capacity chargers inoperable, ~~demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.1a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.~~

Add proposed Required Actions A.1, A.2 and A.3 and Completion Times

L01

M01

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

See ITS 3.8.6

SR 3.8.4.1

2. The total battery terminal voltage is greater than or equal to ~~129 volts on float charge~~.

132 V

the minimum established float voltage

LA02

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

b. In accordance with the Surveillance Frequency Control Program and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1. The parameters in Table 4.8-2 meet the Category B limits,

See ITS 3.8.6

2. There is no visible corrosion at either terminals or connectors, and

See ITS 5.5.14

3. The average electrolyte temperature of 10% (60 cells total) of connected cells is above 50°F.

See ITS 3.8.6

c. In accordance with the Surveillance Frequency Control Program by verifying that:

1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,

2. The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material,

3. Battery cell inter-connection resistance values are maintained at the values below:

See ITS 3.8.6

Battery Inter-Connection Measurement Limits		
Battery Inter-Connection Type	Maximum Individual Inter-Connection Resistance	Maximum Average Inter-Connection Resistance [Battery Bank*]
Inter-Cell	≤ 150 x 10-6 ohms	≤ 50 x 10-6 ohms
Inter-Tier	≤ 200 x 10-6 ohms	
Inter-Rack	≤ 200 x 10-6 ohms	
Output Terminal	≤ 150 x 10-6 ohms	

* The battery bank average interconnection resistance limit is the average of all inter-cell, inter-tier, inter-rack and output terminal connection resistance measurements for all series connections in the battery string

and,

SR 3.8.4.2

4. The battery charger will supply at least 300 amperes at 140 volts for at least 6 hours.

Add proposed 2nd option for SR 3.8.4.2

L02

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

Add proposed SR 3.8.4.3 NOTE 2

SR 3.8.4.3

d. In accordance with the Surveillance Frequency Control Program~~, during shutdown~~, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

L03

e. In accordance with the Surveillance Frequency Control Program, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. ~~This~~ performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.

See ITS 3.8.6

SR 3.8.4.3 NOTE 1

Modified

M02

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

See ITS 3.8.6

TABLE 4 8-2

BATTERY SURVEILLANCE REQUIREMENT

	CATEGORY A(1)	CATEGORY B(2)	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable(3) value for each connected cell
Electrolyte Level	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(c)	> 2.07 volts
Specific Gravity(a)	≥ 1.195(b)	≥ 1.190 Average of all connected cells > 1.200	Not more than .020 below the average of all connected cells Average of all connected cells ≥ 1.190(b)

See ITS 3.8.6

(a) Corrected for electrolyte temperature and level.

(b) Or battery charging current is less than 2 amps when on charge.

(c) Corrected for average electrolyte temperature.

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within the limits within 7 days.

(3) With any Category B parameter not within its allowable value, declare the battery inoperable.

DISCUSSION OF CHANGES
ITS 3.8.4, DC SOURCES - OPERATING

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 Unit 1 CTS LCO 3.8.2.3 and Unit 2 CTS LCO 3.8.2.1 Action b state, "With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.3.2.a.1 within one hour, and at least once per 8 hours thereafter." ITS LCO 3.8.4 Condition A requires, in part, with the required battery charger on one subsystem inoperable, that the required inoperable charger must be restored to OPERABLE status within 72 hours. Refer to DOC L01 for discussion related to less restrictive actions. This changes the CTS by adding a requirement to restore the required charger to Operable status.

The purpose of ITS 3.8.4 Required Actions is to provide the appropriate actions to be taken when a charger becomes inoperable. This change is acceptable because the additional requirements are appropriate to ensure the battery is returned to a condition that it can provide the required safety functions. The ITS requirements are consistent with the ISTS wording for this requirement. This change is designated as more restrictive because it adds an additional required action to restore a required battery charger within 72 hours.

M02 Unit 1 CTS 4.8.2.3.2.e and Unit 2 4.8.2.1.e allow the performance discharge test to be performed in lieu of the battery service test. ITS SR 3.8.4.3 Note 1 provides a similar allowance but requires the performance discharge test to be a modified performance discharge test to be used in lieu of the battery services test. This changes the CTS by requiring a more restrictive type of performance discharge test to be performed in lieu of the battery service test.

The purpose of allowing a performance discharge test in lieu of a battery service test is to eliminate the need to perform two separate tests, thus minimizing the time the battery is unavailable to perform its related electrical support function.

This change is necessary because the normal performance discharge test is inadequate to satisfy the battery service test requirements. A modified discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle) and is described in IEEE 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications." The modified performance discharge test combines the greater of both the peak duty cycle load values of the service test with the load values and duration of the performance capacity test. This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test. It may consist of just two rates; for instance the one minute rate for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test, both of which envelope the duty cycle of the service test. Since the ampere-hours removed by a one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test must remain above the minimum battery terminal voltage specified in the battery service test for the duration of time equal to that of the service test. The ITS requirements are consistent with the ISTS wording for this requirement. This change is designated as more restrictive because it requires a more restrictive allowance than CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS LCO 3.8.2.3 and Unit 2 CTS LCO 3.8.2.1 state, in part, that the DC electrical sources shall be OPERABLE and lists the details of what constitutes a DC electrical power source. ITS LCO 3.8.4 requires the Train A and Train B DC electrical power subsystems to be OPERABLE. This changes the CTS by moving the details of the components of the DC Sources (battery and charger) from the CTS to the ITS Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirements for the DC electrical power subsystems. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Control Program in Chapter 5. The program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information related to system design is being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS surveillance requirement 4.8.2.3.2.a.2 and Unit 2 surveillance requirement 4.8.2.1.a.2 state that each 125 volt battery bank and charger shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program with total battery terminal voltage greater than or equal to 129 volts on float charge. ITS SR 3.8.4.1 requires verification that battery terminal voltage is greater than or equal to “the minimum established float voltage.” This changes the CTS by moving the battery terminal voltage requirements from the specifications to the ITS Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The Technical Specifications still retain the surveillance requirement to verify battery terminal voltage is ≥ the minimum established float voltage. The minimum establish float voltage for the PSL batteries is 2.20 Vpc as specified by the battery manufacturer and equates to 132 V for a 60 cell battery. As such, the 129 volts is changed to 132 V in the ITS Bases to reflect the minimum float voltage specified by the battery manufacturer. This change is acceptable because the removed information will be adequately controlled in the Technical Specification Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Section 5 of the Technical Specifications. This program provides for the evaluation of Bases changes in accordance with 10 CFR 50.59 to ensure the Bases are properly controlled. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 (Category 4 – Relaxation of Required Action) Unit 1 CTS 3.8.2.3 and Unit 2 CTS 3.8.2.1 Action b in part states with one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.3.2.a.1 (Unit 1) and Surveillance Requirement 4.8.2.1.a.1 (Unit 2) within 1 hour. The requirement goes on to state that the action requires the applicable Surveillance Requirement to be performed once per 8 hours thereafter and if any Category A limit in Table 3.8-1 is not met, declare the battery inoperable. ITS LCO 3.8.4 Condition A states, in part, with one required battery charger on one train inoperable, restore battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours (Required Action A.1). Required Action A.2 states a verification of float current of ≤ 2 amps is required once per 12 hours. This changes the CTS by allowing the battery terminal voltage to be restored to the minimum established float voltage with float current to be ≤ 2 amps instead of declaring the battery inoperable based on individual cell parameters.

The purpose of ITS Required Actions is to allow appropriate remedial actions with appropriate time limitations prior to restoring an inoperable battery charger to OPERABLE status. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a design basis accident occurring during the repair period. This change establishes the appropriate actions to be taken with the required battery charger inoperable. The current requirement specifies that all Category A parameters listed in Table 3.8-1 be within limits. The battery charger affect on the associated battery is directly related to the terminal voltage and the charging current in a float condition and not necessarily individual battery cell parameters. With a charger with the capability of restoring the minimum float voltage and less than 2 amps of charging current, the battery can continue to perform its safety related support function and should be considered OPERABLE. Twelve hours is acceptable for the verification of the charging current because it provides a limited time and the required charger must be returned to OPERABLE within 72 hours (Refer to DOC M02 for discussion of restoring the required battery charger). The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS surveillance requirement 4.8.2.3.2.c.4 and Unit 2 surveillance requirement 4.8.2.1.a.2 state that the battery charger will supply at least 300 amps at 140 volts for at least 6 hours. ITS SR 3.8.4.2 provides an alternative test method that allows a verification of each battery charger can recharge the battery to the fully charged state within 12 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state. This changes the CTS by allowing an alternate test that is not currently allowed.

The purpose of Unit 1 CTS 4.8.2.3.2.c.4 and Unit 2 surveillance requirement 4.8.2.1.a.2 is to verify the required 125 V DC battery chargers can recharge their respective batteries following a loss of offsite power event. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. The alternate test provides an acceptable method for determining charger capability by actually recharging a discharged battery within 12 hours while supplying required loads. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L03 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS 4.8.2.3.2.d and Unit 2 4.8.2.1.d state that battery capacity is verified by subjecting the battery to a service test. ITS SR 3.8.4.3 requires a service test to be performed to verify the battery capacity with a modifying Note 2. Note 2 that modifies the SR states “This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.” This changes the CTS by allowing portions of the SR to be performed in MODES 1, 2, 3, or 4 and allowing credit for unplanned events.

The purpose of ITS SR 3.8.4.3 Note 2 is to allow portions of the requirement to be performed to ensure OPERABILITY of the batteries. These portions of the SR may only be performed in MODE 1, 2, 3, or 4 if the safety of the plant is maintained or enhanced. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. The change allows the performance of portions of the SR in MODE 1, 2, 3, or 4 provided plant safety is maintained or enhanced. Normally, the SR is conducted when the battery is not required to be OPERABLE. Under limited conditions, battery OPERABILITY may have to be demonstrated with the plant operating. Verification of battery OPERABILITY under these conditions is infrequent and the plant's safety is always maintained or enhanced by the performance of this requirement. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.2.3
DOC LA01

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

Applicability

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action b. DOC L02 DOC M01	A. ~~One [or two]~~ Required battery charger~~[s]~~ on one subsystem inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours	④
		AND		
		A.2 Verify battery float current ≤ ~~[~~2~~]~~ amps.	Once per ~~[~~12~~]~~ hours	②
		AND		
		A.3 Restore battery charger~~[s]~~ to OPERABLE status.	~~[~~72~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~	
	~~[B. One [or two] batter[y][ies on one subsystem] inoperable.~~	~~B.1 Restore batter[y][ies] to OPERABLE status.~~	~~[2] hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~	③

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
Action a	~~C~~ B. One DC electrical power subsystem inoperable for reasons other than Condition A ~~[or B]~~.	~~C~~ B.1	Restore DC electrical power subsystem to OPERABLE status.	~~[~~2~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~	③ ②
Action a.	~~D~~ C. Required Action and Associated Completion Time not met.	~~D~~ C.1	Be in MODE 3.	6 hours	③
		AND			
		~~D~~ C.2	--------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. ------------------------------------- Be in MODE 4.	12 hours	

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.8.2.3.2.a.2 DOC LA02	SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	②

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
4.8.2.3.2.c.4 DOC L02	SR 3.8.4.2	Verify each battery charger supplies ≥ ~~[400]~~ 300 amps at ~~greater than or equal to the minimum established float voltage~~ 140 V for ≥ ~~[8]~~ 6 hours. <u>OR</u> Verify each battery charger can recharge the battery to the fully charged state within ~~[24]~~ 12 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ②
4.8.2.3.2.e DOC M02 DOC L03 4.8.2.3.2.d	SR 3.8.4.3	-----------------------------NOTES----------------------------- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. --- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.2.1
DOC LA01

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

Applicability

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

Action b.
DOC L02
DOC M01

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ~~One [or two]~~ Required battery charger~~[s]~~ on one subsystem inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours ④
	AND	
	A.2 Verify battery float current ≤ ~~[~~2~~]~~ amps.	Once per ~~[~~12~~]~~ hours
	AND	
	A.3 Restore battery charger~~[s]~~ to OPERABLE status.	~~[~~72~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ ②
~~[B. One [or two] batter[y][ies on one subsystem] inoperable.~~	~~B.1 Restore batter[y][ies] to OPERABLE status.~~	~~[2] hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ ③

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action a.	~~C~~ B. One DC electrical power subsystem inoperable for reasons other than Condition A ~~[or B]~~.	~~C~~ B.1 Restore DC electrical power subsystem to OPERABLE status.	~~[~~2~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~	③ ②
Action a.	~~D~~ C. Required Action and Associated Completion Time not met.	~~D~~ C.1 Be in MODE 3. AND ~~D~~ C.2 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. ------------------------------------- Be in MODE 4.	6 hours 12 hours	③

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.8.2.1.a.2 DOC LA02	SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
4.8.2.1.c.4 DOC L02	SR 3.8.4.2	Verify each battery charger supplies ≥ ~~[400]~~ 300 amps at ~~greater than or equal to the minimum established float voltage~~ 140 V for ≥ ~~[8]~~ 6 hours. <u>OR</u> Verify each battery charger can recharge the battery to the fully charged state within ~~[24]~~ 12 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ②
4.8.2.1.e DOC M02 DOC L03	SR 3.8.4.3	-----------------------------NOTES----------------------------- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---		
4.8.2.1.d		Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.4, DC SOURCES - OPERATING

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The bracketed ISTS 3.8.4 ACTION B has been deleted since it is not necessary. ISTS 3.8.4 ACTION C (ITS 3.8.4 ACTION B) covers the condition of an inoperable battery. Due to this deletion, the subsequent ACTIONS have been arranged in sequence.

4. Changed the word “One” to “Required” in ISTS 3.8.4 Condition A since there are two DC electrical power system chargers per DC electrical power subsystem and only one is required for each subsystem.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources - Operating

BASES

BACKGROUND

The station DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC ~~vital~~ bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of ~~Regulatory~~ Guide ~~1.~~6 (Ref. 2) and IEEE-308 (Ref. 3). ① ①

instrument

Safety

The ~~[~~125~~/250]~~ VDC electrical power system consists of two independent and redundant safety related Class 1E DC electrical power subsystems (~~[~~Train A and Train B~~]~~). Each subsystem consists of ~~[two]~~ 125 VDC batter~~ies~~ ~~[(each battery [50]% capacity)], the associated~~ battery charger~~(~~s~~)~~ for each battery, and all the associated control equipment and interconnecting cabling. ② ①

one

y, two redundant

(one required)

Each battery charger is individually adequate to support the train's required safety function. The redundant battery

The system has a third swing load group (AB) including a fifth battery charger on the AB bus that provides an alternate backup to either the two A-train or two B-train battery chargers.

~~[The 250 VDC source is obtained by use of the two 125 VDC batteries connected in series. Additionally there is [one] spare battery~~ charger ~~per subsystem, which provides backup service in the event that the preferred battery charger is out of service~~. If the ~~spare~~ battery charger is substituted ~~for one of the preferred battery chargers, then~~ the requirements of independence and redundancy between subsystems are maintained.~~]~~ ②

AB

s operate continuously with load equally distributed by means of a load sharing device

During normal operation, the ~~[~~125~~/250]~~ VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to ~~the battery charger,~~ the DC load is automatically powered from the station batteries. ①

one battery charger, the DC load is automatically powered from the one remaining battery charger. Upon loss of both normal battery chargers,

until the alternate backup charger can be aligned to the 125 VDC bus.

The ~~[~~Train A and Train B~~]~~ DC electrical power subsystems provide the control power for its associated Class 1E AC power load group, ~~[~~4.16~~]~~ kV switchgear, and ~~[~~480~~]~~ V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC ~~vital buses~~. ② ①

Instrument

System

The DC power distribution system is described in more detail in the Bases for LCO 3.8.9, "Distributions System Operating," and for LCO 3.8.10, "Distribution Systems - Shutdown."

BACKGROUND (continued)

Each 125~~/250~~ VDC battery is separately housed in a ventilated room ~~apart from its charger and distribution centers~~. Each subsystem is located in an area separated physically and electrically from the other subsystem to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. ~~[~~There is no sharing between redundant Class 1E subsystems, such as batteries, battery chargers, or distribution panels.~~]~~ ① ②

U

Each battery has adequate storage capacity to meet the duty cycle(s) discussed in the FSAR, Chapter ~~[~~8~~]~~ (Ref 4). The battery is designed with additional capacity above that required by the design duty cycle to allow for temperature variations and other factors. ② ①

of 105 V is bounded by the minimum calculated DC System voltage required to support the DC loads.

The batteries for Train A and Train B DC electrical power subsystems are sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. The minimum design voltage limit ~~is [105/210] V.~~ ①

123.8

60

2.063

recommended

2.20 to 2.25

132 V to 135

60

The battery cells are of flooded lead acid construction with a nominal specific gravity of ~~[~~1.215~~]~~. This specific gravity corresponds to an open circuit battery voltage of approximately ~~120~~ V for a ~~[58]~~ cell battery (i.e., cell voltage of ~~[2.065]~~ volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. ~~Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions.~~ Optimal long term performance however, is obtained by maintaining a float voltage ~~[~~2.20 to 2.25~~]~~ Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The nominal float voltage of ~~[2.22]~~ Vpc corresponds to a total float voltage output of ~~[128.8]~~ V for a ~~[58]~~ cell battery ~~as discussed in the FSAR, Chapter [8] (Ref. 4)~~. ① ④ ② ① ①

12

Each Train A and Train B DC electrical power subsystem battery charger has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient excess capacity to restore the battery from the design minimum charge to its fully charged state within ~~[24]~~ hours while supplying normal steady state loads ~~discussed in the FSAR, Chapter [8] (Ref. 4)~~. ② ①

BASES

BACKGROUND (continued)

The battery charger is normally in the float-charge mode. Float-charge is the condition in which the charger is supplying the connected loads and the battery cells are receiving adequate current to optimally charge the battery. This assures the internal losses of a battery are overcome and the battery is maintained in a fully charged state.

When desired, the charger can be placed in the equalize mode. The equalize mode is at a higher voltage than the float mode and charging current is correspondingly higher. The battery charger is operated in the equalize mode after a battery discharge or for routine maintenance. Following a battery discharge, the battery recharge characteristic accepts current at the current limit of the battery charger (if the discharge was significant, e.g., following a battery service test) until the battery terminal voltage approaches the charger voltage setpoint. Charging current then reduces exponentially during the remainder of the recharge cycle. Lead-calcium batteries have recharge efficiencies of greater than 95%, so once at least 105% of the ampere-hours discharged have been returned, the battery capacity would be restored to the same condition as it was prior to the discharge. This can be monitored by direct observation of the exponentially decaying charging current or by evaluating the amp-hours discharged from the battery and amp-hours returned to the battery.

Battery parameters are described in further detail in the Bases for LCO 3.8.6, “Battery Parameters.” ①

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 5) and Chapter ~~[~~15~~]~~ (Ref. 6), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. ② ①

The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining the DC sources OPERABLE during accident conditions in the event of:

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

b. A worst-case single failure.

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

BASES

LCO

The DC electrical power subsystems, each subsystem consisting of ~~[two]~~ one batter~~ies,~~y one of two battery charger s ~~[for each battery]~~ and the corresponding control equipment and interconnecting cabling supplying power to the associated bus within the subsystem are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of any DC electrical power subsystem does not prevent the minimum safety function from being performed (Ref. 4). ② ①

An OPERABLE DC electrical power subsystem requires ~~all required~~ the associated batter~~ies~~y and ~~respective~~ one charger~~s~~ to be operating and connected to the associated DC bus(es). ①

APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC electrical power requirements for MODES 5 and 6 are addressed in the Bases for LCO 3.8.5, "DC Sources - Shutdown."

ACTIONS

A.1, A.2, and A.3

Condition A represents one subsystem with one required ~~[or two]~~ battery charger~~s~~ ② ① inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within ~~[~~12~~]~~ hours, ② the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability.

BASES

ACTIONS (continued)

~~--------------------------------REVIEWER'S NOTE--------------------------------~~
~~A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).~~ ③
~~---~~

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within ~~[~~12~~]~~ hours, avoiding a premature shutdown ② with its own attendant risk.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within ~~[~~12~~]~~ hours (Required Action A.2). ②

Required Action A.2 requires that the battery float current be verified as less than or equal to ~~[~~2~~]~~ amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable of supplying the maximum expected load requirement. The ~~[~~2~~]~~ amp value is based on returning the battery to ~~[~~95~~]~~% charge and assumes a ~~[~~5~~]~~% design margin for the battery. If at the expiration of the initial ~~[~~12~~]~~ hour period the battery float current is not less than or equal to ~~[~~2~~]~~ amps this indicates there may be additional battery problems and the battery must be declared inoperable. ②

BASES

ACTIONS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Any licensee wishing to adopt Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decision Making: Technical Specifications", and RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Alternatively, a 7 day Completion Time can be justified by an acceptable method, such as a regulatory commitment that an alternate means to charge the batteries will be available that is capable of being supplied power from a power source that is independent of the offsite power supply. Otherwise, the 72 hour Completion Time must be adopted.~~
~~---~~ ③

Required Action A.3 limits the restoration time for the inoperable battery charger to ~~[~~72~~]~~ hours. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used~~ (e.g., balance of plant non-Class 1E battery charger)~~. The ~~[~~72~~]~~ hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status. ②

~~B.1~~ ⑤

~~---------------------------------REVIEWER'S NOTE'S---------------------------------~~
~~1. The 2 hour Completion Times of Required Actions B.1 and C.1 are in brackets. Any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in RG 1.177 and 1.174.~~

~~2. Condition B is included if Required Action B.1 (one [or two] batter[y][ies on one subsystem] inoperable) and Required Action C.1 (one DC electrical power subsystem inoperable for reasons other than Condition A [or B]) would have different Completion Times. If the plant design supports different Completion Times when a battery is inoperable but the charger is OPERABLE, then Condition B is used. If not, Condition B is deleted and only Condition C is used.~~
~~---~~ ③

BASES

ACTIONS (continued)

~~Condition B represents one subsystem with one [or two] batter[y][ies] inoperable. With one [or two] batter[y][ies] inoperable, the DC bus is being supplied by the OPERABLE battery charger[s]. Any event that results in a loss of the AC bus supporting the battery charger[s] will also result in loss of DC to that subsystem. Recovery of the AC bus, especially if it is due to a loss of offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g., diesel generator control and field flash, AC load shed and diesel generator output circuit breakers, etc.) likely rely upon the batter[y][ies]. In addition the energization transients of any DC loads that are beyond the capability of the battery charger[s] and normally require the assistance of the batter[y][ies] will not be able to be brought online. The [2] hour limit allows sufficient time to effect restoration of an inoperable battery given that the majority of the conditions that lead to battery inoperability (e.g., loss of battery charger, battery cell voltage less than [2.07] V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific Completion Times. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ②

~~C~~.1 ⑤

B

Condition ~~C~~ represents one subsystem with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected subsystem. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution subsystem. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ②

If one of the required DC electrical power subsystems is inoperable for reasons other than Condition A ~~or B~~ (e.g., inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of the minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown. ⑤

BASES

ACTIONS (continued)

~~D~~.1 and ~~D~~.2 ⑤

C

~~-------------------------------REVIEWER'S NOTE -------------------------------~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~
~~---~~

③

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours.

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 8). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.

C

Required Action ~~D~~.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit. ⑤

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

ACTIONS (continued)

The Completion Time to bring the unit to MODE 4 ~~5~~ is consistent with ~~the time required in Regulatory Guide 1.93~~ topical report, CE NPSD-1186-A (Ref. ~~7~~ 8). ⑤ ①

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer (~~[~~2.20~~]~~ Vpc times the number of connected cells or ~~[127.6]~~ 132 V for a ~~58~~ 60 cell battery at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life. ~~[The 7 day Frequency is consistent with manufacturer recommendations.~~ ① ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~--]~~ ②

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to ~~Regulatory~~ Safety Guide ~~1.~~32 (Ref. 9), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied. ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR provides two options. One option requires that each battery charger be capable of supplying ~~[400]~~ 300 amps at ~~the minimum established float voltage~~ 140 V for ~~[8]~~ 6 hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least ~~[~~2~~]~~ hours. ① ②

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest coincident demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ ~~[~~2~~]~~ amps.

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

~~OR~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~--]~~ ②

SR 3.8.4.3

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Surveillance Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 9) and Regulatory Guide 1.129 (Ref. 10), which state that the battery service test should be performed during refueling operations, or at some other outage, with intervals between tests not to exceed [18 months].~~

~~OR~~ ②

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~--]~~ ②

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

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

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17 (as amended through February 20, 1971).
2. ~~Regulatory~~ Safety Guide ~~1.~~6, March 10, 1971. ①
3. IEEE-308-~~[~~197~~8~~1~~]~~. ②

BASES

REFERENCES (continued)

4. FSAR, Chapter ~~[~~8~~]~~.

U

5. FSAR, Chapter ~~[~~6~~]~~.

U

6. FSAR, Chapter ~~[~~15~~]~~.

② ①

7. Regulatory Guide 1.93, December 1974.

8. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

Safety

9. ~~Regulatory~~ Guide ~~1.~~32~~, February 1977~~.

~~10. Regulatory Guide 1.129, December 1974.~~

①

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources - Operating

BASES

BACKGROUND

The station DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC ~~vital~~ bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Regulatory Guide 1.6 (Ref. 2) and IEEE-308 (Ref. 3). ① ①

instrument

The ~~[~~125~~/250]~~ VDC electrical power system consists of two independent and redundant safety related Class 1E DC electrical power subsystems (~~[~~Train A and Train B~~]~~). Each subsystem consists of ~~[two]~~ 125 VDC batteri~~es~~ ~~[(each battery [50]% capacity)], the associated~~ battery charger~~(~~s~~)~~ for each battery, and all the associated control equipment and interconnecting cabling. ② ①

one

y, two redundant

(one required)

Each battery charger is individually adequate to support the train's required safety function. The redundant battery

The system has a third swing load group (AB) including a fifth battery charger on the AB bus that provides an alternate backup to either the two A-train or two B-train battery chargers .

~~[The 250 VDC source is obtained by use of the two 125 VDC batteries connected in series. Additionally there is [one] spare battery~~ charger ~~per subsystem, which provides backup service in the event that the preferred battery charger is out of service~~. If the ~~spare~~ battery charger is substituted ~~for one of the preferred battery chargers, then~~ the requirements of independence and redundancy between subsystems are maintained.~~]~~ ②

AB

s operate continuously with load equally distributed by means of a load sharing device

During normal operation, the ~~[~~125~~/250]~~ VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to ~~the battery charger,~~ the DC load is automatically powered from the station batterie~~s~~. ①

one battery charger, the DC load is automatically powered from the one remaining battery charger. Upon loss of both normal battery chargers,

until the alternate backup charger can be aligned to the 125 VDC bus.

The ~~[~~Train A and Train B~~]~~ DC electrical power subsystems provide the control power for its associated Class 1E AC power load group, ~~[~~4.16~~]~~ kV switchgear, and ~~[~~480~~]~~ V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC ~~vital buses~~. ② ①

Instrument

System

The DC power distribution system is described in more detail in the Bases for LCO 3.8.9, "Distributions System Operating," and for LCO 3.8.10, "Distribution Systems - Shutdown."

BASES

BACKGROUND (continued)

Each 125~~/250~~ VDC battery is separately housed in a ventilated room ~~apart from its charger and distribution centers~~. Each subsystem is located in an area separated physically and electrically from the other subsystem to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. ~~[~~There is no sharing between redundant Class 1E subsystems, such as batteries, battery chargers, or distribution panels.~~]~~ ① ②

Each battery has adequate storage capacity to meet the duty cycle(s) discussed in the U FSAR, Chapter ~~[~~8~~]~~ (Ref 4). The battery is designed with additional capacity above that required by the design duty cycle to allow for temperature variations and other factors. ② ①

The batteries for Train A and Train B DC electrical power subsystems are sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. The minimum design voltage limit ~~is [105/210] V.~~ of 105 V is bounded by the minimum calculated DC System voltage required to support the DC loads. ①

The battery cells are of flooded lead acid construction with a nominal specific gravity of ~~[~~1.215~~]~~. This specific gravity corresponds to an open circuit battery voltage of approximately ~~120~~ 123.8 V for a ~~[58]~~ 60 cell battery (i.e., cell voltage of ~~[2.065]~~ 2.063 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. ~~Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions.~~ Optimal long term performance however, is obtained by maintaining a recommended float voltage ~~[~~2.20 to 2.25~~]~~ Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The nominal float voltage of ~~[2.22]~~ 2.20 to 2.25 Vpc corresponds to a total float voltage output of ~~[128.8]~~ 132 V to 135 V for a ~~[58]~~ 60 cell battery ~~as discussed in the FSAR, Chapter [8] (Ref. 4)~~. ① ④ ② ① ①

Each Train A and Train B DC electrical power subsystem battery charger has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient excess capacity to restore the battery from the design minimum charge to its fully charged state within ~~[24]~~ 12 hours while supplying normal steady state loads ~~discussed in the FSAR, Chapter [8] (Ref. 4)~~. ② ①

BASES

BACKGROUND (continued)

The battery charger is normally in the float-charge mode. Float-charge is the condition in which the charger is supplying the connected loads and the battery cells are receiving adequate current to optimally charge the battery. This assures the internal losses of a battery are overcome and the battery is maintained in a fully charged state.

When desired, the charger can be placed in the equalize mode. The equalize mode is at a higher voltage than the float mode and charging current is correspondingly higher. The battery charger is operated in the equalize mode after a battery discharge or for routine maintenance. Following a battery discharge, the battery recharge characteristic accepts current at the current limit of the battery charger (if the discharge was significant, e.g., following a battery service test) until the battery terminal voltage approaches the charger voltage setpoint. Charging current then reduces exponentially during the remainder of the recharge cycle. Lead-calcium batteries have recharge efficiencies of greater than 95%, so once at least 105% of the ampere-hours discharged have been returned, the battery capacity would be restored to the same condition as it was prior to the discharge. This can be monitored by direct observation of the exponentially decaying charging current or by evaluating the amp-hours discharged from the battery and amp-hours returned to the battery.

Battery parameters are described in further detail in the Bases for LCO 3.8.6, “Battery Parameters.” ①

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 5) and Chapter ~~[~~15~~]~~ (Ref. 6), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. ② ①

The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining the DC sources OPERABLE during accident conditions in the event of:

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

b. A worst-case single failure.

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

BASES

LCO

The DC electrical power subsystems, each subsystem consisting of one ~~[two]~~ batter~~ies,~~ y one of two battery charger s ~~[for each battery]~~ and the corresponding control equipment and interconnecting cabling supplying power to the associated bus within the subsystem are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of any DC electrical power subsystem does not prevent the minimum safety function from being performed (Ref. 4). ② ①

An OPERABLE DC electrical power subsystem requires ~~all required~~ the associated batter~~ies~~ y and ~~respective~~ one charger~~s~~ to be operating and connected to the associated DC bus(es). ①

APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC electrical power requirements for MODES 5 and 6 are addressed in the Bases for LCO 3.8.5, "DC Sources - Shutdown."

ACTIONS

A.1, A.2, and A.3

Condition A represents one subsystem with one required ~~[or two]~~ battery charger~~s~~ ② ① inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within ~~[~~12~~]~~ hours, ② the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability.

BASES

ACTIONS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).~~ ③
~~---~~

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within ~~[~~12~~]~~ hours, avoiding a premature shutdown with its own attendant risk. ②

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within ~~[~~12~~]~~ hours (Required Action A.2). ②

Required Action A.2 requires that the battery float current be verified as less than or equal to ~~[~~2~~]~~ amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable of supplying the maximum expected load requirement. The ~~[~~2~~]~~ amp value is based on returning the battery to ~~[~~95~~]~~% charge and assumes a ~~[~~5~~]~~% design margin for the battery. If at the expiration of the initial ~~[~~12~~]~~ hour period the battery float current is not less than or equal to ~~[~~2~~]~~ amps this indicates there may be additional battery problems and the battery must be declared inoperable. ②

ACTIONS (continued)

~~-----------------------------REVIEWER’S NOTE-----------------------------~~
~~Any licensee wishing to adopt Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decision Making: Technical Specifications", and RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Alternatively, a 7 day Completion Time can be justified by an acceptable method, such as a regulatory commitment that an alternate means to charge the batteries will be available that is capable of being supplied power from a power source that is independent of the offsite power supply. Otherwise, the 72 hour Completion Time must be adopted.~~
~~---~~ ③

Required Action A.3 limits the restoration time for the inoperable battery charger to ~~[~~72~~]~~ hours. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used ~~(e.g., balance of plant non-Class 1E battery charger)~~. The ~~[~~72~~]~~ hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status. ②

~~B.1~~ ⑤

~~---------------------------REVIEWER’S NOTE'S---------------------------~~
~~1. The 2 hour Completion Times of Required Actions B.1 and C.1 are in brackets. Any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in RG 1.177 and 1.174.~~

~~2. Condition B is included if Required Action B.1 (one [or two] batter[y][ies on one subsystem] inoperable) and Required Action C.1 (one DC electrical power subsystem inoperable for reasons other than Condition A [or B]) would have different Completion Times. If the plant design supports different Completion Times when a battery is inoperable but the charger is OPERABLE, then Condition B is used. If not, Condition B is deleted and only Condition C is used.~~
~~---~~ ③

BASES

ACTIONS (continued)

~~Condition B represents one subsystem with one [or two] batter[y][ies] inoperable. With one [or two] batter[y][ies] inoperable, the DC bus is being supplied by the OPERABLE battery charger[s]. Any event that results in a loss of the AC bus supporting the battery charger[s] will also result in loss of DC to that subsystem. Recovery of the AC bus, especially if it is due to a loss of offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g., diesel generator control and field flash, AC load shed and diesel generator output circuit breakers, etc.) likely rely upon the batter[y][ies]. In addition the energization transients of any DC loads that are beyond the capability of the battery charger[s] and normally require the assistance of the batter[y][ies] will not be able to be brought online. The [2] hour limit allows sufficient time to effect restoration of an inoperable battery given that the majority of the conditions that lead to battery inoperability (e.g., loss of battery charger, battery cell voltage less than [2.07] V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific Completion Times. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ②

~~C~~B.1 ⑤

Condition ~~C~~ B represents one subsystem with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected subsystem. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution subsystem. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ②

If one of the required DC electrical power subsystems is inoperable for reasons other than Condition A ~~or B~~ (e.g., inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of the minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown. ⑤

BASES

ACTIONS (continued)

C

~~D~~.1 and ~~D~~.2 ⑤

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~
~~---~~

③

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours.

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 8). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.

C

Required Action ~~D~~.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit. ⑤

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

ACTIONS (continued)

The Completion Time to bring the unit to MODE ~~5~~ 4 is consistent with ~~the time required in Regulatory Guide 1.93~~ topical report, CE NPSD-1186-A (Ref. ~~7~~ 8). ⑤ ①

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer (~~[~~2.20~~]~~ Vpc times the number of connected cells or ~~[127.6]~~ 132 V for a ~~58~~ 60 cell battery at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life. ~~[The 7 day Frequency is consistent with manufacturer recommendations.~~ ① ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~---~~] ②

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

BASES

SURVEILLANCE REQUIREMENTS (continued)

This SR provides two options. One option requires that each battery charger be capable of supplying ~~[400]~~ 300 amps at ~~the minimum established float voltage~~ 140 V for ~~[8]~~ 6 hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least ~~[~~2~~]~~ hours. ① ②

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest coincident demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ ~~[~~2~~]~~ amps.

~~[The Surveillance Frequency of 18 months is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these [18 month] intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~---]~~ ②

SR 3.8.4.3

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Surveillance Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 9) and Regulatory Guide 1.129 (Ref. 10), which state that the battery service test should be performed during refueling operations, or at some other outage, with intervals between tests not to exceed [18 months].~~ ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~---]~~ ②

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

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

1.6ERENCES

1. 10 CFR 50, Appendix A, GDC 17 (as amended through February 20, 1971). ①
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE-308-~~[~~197~~8~~1~~]~~. ②

BASES

REFERENCES (continued)

U

4. FSAR, Chapter ~~[~~8~~]~~.

5. FSAR, Chapter ~~[~~6~~]~~.

U

6. FSAR, Chapter ~~[~~15~~]~~.

② ①

7. Regulatory Guide 1.93, December 1974.

8. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

9. Regulatory Guide 1.32~~, February 1977~~.

~~10. Regulatory Guide 1.129, December 1974.~~

①

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.4 BASES, DC SOURCES - OPERATING

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.
2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.
3. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.
4. These battery design values have been deleted because they are more specific than necessary and are not required to provide sufficient background for this Specification.
5. Changes have been made to be consistent with changes made to the Specifications.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.4, DC SOURCES - OPERATING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 5

ITS 3.8.5, DC Sources - Shutdown

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

ELECTRICAL POWER SYSTEMS

SOURCES

D.C. ~~DISTRIBUTION~~ - SHUTDOWN

See ITS 3.8.10

LIMITING CONDITION FOR OPERATION

One power subsystem

LA01

LCO 3.8.5 3.8.2.4 ~~As a minimum, the following~~ D.C. electrical ~~equipment and bus~~ shall be energized ~~and~~ OPERABLE~~:~~

1 - 125-volt D.C. bus, and

See ITS 3.8.10

~~1 - 125-volt battery bank and charger supplying the above D.C. bus.~~

LA01

Applicability **APPLICABILITY**: MODES 5 and 6~~.~~ ,

During movement of irradiated fuel assemblies.

M01

ACTION **ACTION**:

Add proposed ACTIONS NOTE

~~With less than the above complement of D.C. equipment and bus OPERABLE, establish CONTAINMENT INTEGRITY within 8 hours.~~

Add proposed ACTION A

L01

SURVEILLANCE REQUIREMENTS

4.8.2.4.1 The above required 125-volt D.C. bus shall be determined OPERABLE and energized in accordance with the Surveillance Frequency Control Program by verifying indicated power availability.

See ITS 3.8.10

Add proposed SR 3.8.5.1 NOTE

L02

SR 3.8.5.1 4.8.2.4.2 The above required 125-volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2.

ITS A01 ITS 3.8.5

ELECTRICAL POWER SYSTEMS

D.C. SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

LA01

DC electrical power subsystem

LCO 3.8.5 3.8.2.2 ~~As a minimum,~~ one ~~125-volt battery bank and a full capacity charger~~ shall be OPERABLE.

Applicability **APPLICABILITY**: MODES 5 and 6~~.~~ ,

During movement of irradiated fuel assemblies.

ACTION **ACTION**:

Add proposed ACTIONS NOTE

M01

ACTION A.1, A.2, A.3

a. With the required battery bank inoperable, immediately suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or boron concentration, or movement of irradiated fuel; initiate corrective action to restore the required battery bank to OPERABLE status as soon as possible~~, and within 8 hours, depressurize and vent the Reactor Coolant System through a 3.58 square inch vent~~.

L03

b. ~~With the required full capacity charger inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.~~

L04

SURVEILLANCE REQUIREMENTS

Add proposed SR 3.8.5.1 NOTE

L02

SR 3.8.5.1 4.8.2.2 The above required 125-volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.1.

DISCUSSION OF CHANGES
ITS 3.8.5, DC SOURCES - SHUTDOWN

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 Unit 1 CTS 3.8.2.4 and Unit 2 CTS 3.8.2.2 are applicable in MODES 5 and 6. ITS 3.8.5 is applicable in MODES 5 and 6 and during movement of irradiated fuel assemblies. A Note has been added to the ACTIONS which states that LCO 3.0.3 is not applicable. This changes the CTS by adding the Applicability of during movement of irradiated fuel assemblies and adds the Note to the ACTIONS stating that LCO 3.0.3 is not applicable.

This change is acceptable because the proposed requirements are necessary to ensure the DC electrical power sources are OPERABLE to support equipment required to be OPERABLE during movement of irradiated fuel assemblies. Movement of fuel normally occurs during MODES 5 and 6, however, it can also occur outside of containment in other plant MODES (MODES 1, 2, 3, and 4) or other conditions (i.e., reactor defueled). This Specification is needed to ensure the appropriate DC electrical power source requirements are specified during fuel handling and ensure the appropriate actions are taken (i.e., stop fuel movement) when the minimum electrical supplies are not available (See Unit 1 DOC L01 and Unit 2 DOCs L03 and L04 for the changes to the Required Actions). This change adds a clarification Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODES 5 or 6, LCO 3.0.3 is not applicable and would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, or 4, the fuel movement is independent of reactor operations and the inability to suspend movement in accordance with the ITS 3.8.5 Required Actions would not be sufficient reason to require a reactor shutdown. This Note has been added for clarification and is necessary since defaulting to LCO 3.0.3 would require the reactor to be shutdown but would not require suspension of activities with a potential for releasing radioactive materials. This change is designated as more restrictive because the ITS requires the equipment to be OPERABLE during movement of irradiated fuel assemblies both inside and outside of the containment in conditions other than MODES 5 and 6.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS 3.8.2.4 states, in part, 1 - 125-volt battery bank and charger supplying the DC bus. Unit 2 CTS 3.8.2.2 requires a minimum of one 125 volt battery and a full capacity charger. ITS LCO 3.8.5 requires one DC electrical power subsystem to be OPERABLE. This changes the CTS by moving the details of the DC electrical power subsystems from the CTS to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the OPERABILITY requirements for electrical power trains. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Control Program in Chapter 5. The program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 **Unit 1 only:** *(Category 4 – Relaxation of Required Action)* Unit 1 CTS 3.8.2.4 ACTION requires the establishment of containment integrity within 8 hours with less than the minimum complement of DC sources OPERABLE. ITS 3.8.5 ACTION A requires suspending movement of irradiated fuel assemblies, suspending operations involving a positive reactivity addition that could result in the loss of required SDM or boron concentration, and the initiation of action to restore required DC electrical power sources to OPERABLE status. This changes the CTS by replacing the existing Required Action to restore containment integrity with Actions that will prevent a fuel handling accident from occurring and Actions that will ensure the reactor remains subcritical.

The purpose of the CTS 3.8.2.4 Action is to isolate the containment to minimize any release from the plant if an event were to occur during shutdown conditions with no DC Sources OPERABLE. This change is acceptable because the ITS Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The proposed Required Actions require the suspension of movement of irradiated fuel assemblies, suspension of operations involving positive reactivity additions that could result in the loss of required SDM or boron concentration, and the initiation of actions to restore required DC electrical power subsystem to OPERABLE status. Suspending the movement of irradiated fuel assemblies will prevent a fuel handling accident from occurring and suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit will ensure the reactor remains subcritical. The requirement to initiate action to restore the required DC electrical power subsystem to OPERABLE status will ensure the plant is placed in compliance with the LCO in an expeditious manner. The proposed actions will also minimize the potential for any accident releases outside of the containment and are considered acceptable in lieu of the current action to restore containment integrity within 8 hours. The actions may be considered somewhat more restrictive since immediate action is required, however, is classified as less restrictive since the current actions to restore containment integrity have been deleted. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 7 - Relaxation Of Surveillance Frequency)* Unit 1 CTS 4.8.2.4.2 and Unit 2 CTS 4.8.2.2 require the demonstration of the OPERABILITY of the 125 VDC battery banks and chargers in accordance with the Surveillance Requirements of Unit 1 CTS 4.8.2.3.2 and Unit 2 CTS 4.8.2.1. ITS SR 3.8.5.1 requires SR 3.8.4.1, SR 3.8.4.2, and SR 3.8.4.3 to be applicable. However, a Note has been added that states ITS SR 3.8.4.2 and SR 3.8.4.3 do not have to be performed. This changes the CTS by allowing certain SRs not to be performed.

The purpose of the ITS SR 3.8.5.1 Note is to ensure that required equipment is not made inoperable by testing when the equipment is the only OPERABLE equipment available to support unit operations. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. ITS SR 3.8.4.3 is the battery capacity test. ITS SR 3.8.4.2 is a battery charger capacity test. The performance of these SRs involves tests that would cause the only required OPERABLE DC electrical power subsystem components to be rendered inoperable. This condition presents a significant risk if an event were to occur during test performance. In an effort to address this concern, ITS SR 3.8.5.1 has a Note that excludes performance requirements of any Surveillance that would require the required OPERABLE DC electrical power subsystem components to be rendered inoperable. This allowance does not take exception to the requirement for the DC electrical power subsystem to be capable of performing the particular function, but just to the requirement to demonstrate that capability while the required DC source of power is being relied on to support meeting the LCO. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L03 **Unit 2 only:** *(Category 4 – Relaxation of Required Action)* Unit 2 CTS 3.8.2.2 Action b states, in part, “with the required battery bank inoperable, within 8 hours, depressurize and vent the Reactor Coolant System through a 3.58 square inch vent. ITS 3.8.5 does not include a required action for depressurizing and venting the Reactor Coolant System. This changes the CTS by removing the requirement to depressurize and vent the Reactor Coolant System within 8 hours with the required battery bank inoperable.

The purpose of minimum DC electrical power subsystem technical specification required actions is to establish mitigating actions with appropriate time limitations to restore the minimum required DC electrical power subsystem. This change is acceptable because CTS 3.4.9.3 provides the operability requirements, mitigating actions, and time limitations for low temperature overpressure protection (LTOP) systems. CTS 3.4.9.3 Action a.1 requires depressurization and venting of the Reactor Coolant System when the LTOP System is inoperable for any reason including the loss of DC power to required LTOP components. ITS 3.4.12 retains the required CTS ACTION. Refer to ITS 3.4.12 Discussion of Changes for changes to CTS 3.4.9.3 actions. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 **Unit 2 only:** *(Category 4 – Relaxation of Required Action)* Unit 2 CTS 3.8.2.2 Action b in part states with the required full capacity charger inoperable, demonstrate the OPERABILITY of its associated battery bank. ITS LCO 3.8.5 does not include Actions for an inoperable required battery charger for plants that require only one DC electrical power subsystem to be OPERABLE during shutdown conditions. This changes CTS by removing the CTS ACTIONS associated with a required full capacity charger inoperable.

The purpose of the ITS 3.8.5 Required Actions is to allow appropriate remedial actions with appropriate time limitations to restore a required inoperable DC electrical power subsystem to OPERABLE status. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk while providing time to restore inoperable features. This change establishes the appropriate actions to be taken with an inoperable required DC electrical power subsystem for the PSL Unit 2 design. The proposed Required Actions require the suspension of movement of irradiated fuel assemblies, suspension of operations involving positive reactivity additions that could result in the loss of required SDM or boron concentration, and the initiation of actions to restore required DC electrical power subsystem to OPERABLE status. Suspending the movement of irradiated fuel assemblies will prevent a fuel handling accident from occurring and suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit will ensure the reactor remains subcritical. The requirement to initiate action to restore the required DC electrical power subsystem to OPERABLE status will ensure the plant is placed in compliance with the LCO in an expeditious manner. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

3.8.2.4 LCO 3.8.5 ~~[DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."]~~ ①

~~[~~One DC electrical power subsystem shall be OPERABLE.~~]~~ ③

~~-----REVIEWER'S NOTE-----~~
~~This second option above applies for plants having a pre-ITS licensing basis (CTS) for electrical power requirements during shutdown conditions that required only one DC electrical power subsystem to be OPERABLE. Action A and the bracketed optional wording in Condition B are also eliminated for this case. The first option above is adopted for plants that have a CTS requiring the same level of DC electrical power subsystem support as is required for power operating conditions.~~ ①
~~-----~~

Applicability
DOC M01 APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies. ③

ACTIONS

-----NOTE-----
DOC M01 LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~[A. One [or two] battery charger[s on one subsystem] inoperable.~~ ~~AND~~ ~~The redundant subsystem battery and charger[s] OPERABLE.~~	~~A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.~~	~~2 hours~~
	~~AND~~	
	~~A.2 Verify battery float current ≤ [2] amps.~~	~~Once per [12] hours~~
	~~AND~~	

①

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
		~~A.3 Restore battery charger[s] to OPERABLE status.~~	~~[72] hours]~~	①
3.8.2.4 Action DOC L01	~~B~~A. ~~One [or more] r~~Required DC electrical power subsystem~~[s]~~ inoperable ~~[for reasons other than Condition A.~~ ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met]~~.	~~B.1 Declare affected required feature(s) inoperable.~~	~~Immediately~~	① ②
		~~OR~~		
		~~B.2.1~~ A.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately	③ ①
		AND		
		~~B.2.2~~ A.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately	①
		AND		
		~~B.2.3~~ A.3 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately	①

CTS

SURVEILLANCE REQUIREMENTS

4.8.2.4.2
DOC L02

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	-------------------------------NOTE------------------------------ The following SRs are not required to be performed: SR 3.8.4.2 and SR 3.8.4.3. --- For the DC source~~s~~ required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1 SR 3.8.4.2 SR 3.8.4.3	In accordance with applicable SRs ②

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

3.8.2.2 LCO 3.8.5

~~[DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."]~~ ①

~~[~~One DC electrical power subsystem shall be OPERABLE.~~]~~ ③

~~-----REVIEWER'S NOTE-----~~
~~This second option above applies for plants having a pre-ITS licensing basis (CTS) for electrical power requirements during shutdown conditions that required only one DC electrical power subsystem to be OPERABLE. Action A and the bracketed optional wording in Condition B are also eliminated for this case. The first option above is adopted for plants that have a CTS requiring the same level of DC electrical power subsystem support as is required for power operating conditions.~~ ①
~~-----~~

Applicability
DOC M01

APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies. ③

ACTIONS

-----NOTE-----
DOC M01 LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~[A. One [or two] battery charger[s on one subsystem] inoperable.~~ ~~AND~~ ~~The redundant subsystem battery and charger[s] OPERABLE.~~	~~A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.~~ ~~AND~~ ~~A.2 Verify battery float current ≤ [2] amps.~~ ~~AND~~	~~2 hours~~ ~~Once per [12] hours~~

①

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
		~~A.3 Restore battery charger[s] to OPERABLE status.~~	~~[72] hours]~~	①
3.8.2.4 Action	A ~~B~~. ~~One [or more] r~~Required DC electrical power subsystem~~[s]~~ inoperable ~~[for reasons other than Condition A.~~ ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met]~~.	~~B.1 Declare affected required feature(s) inoperable.~~	~~Immediately~~	② ①
Action a		~~OR~~ A.1 ~~B.2.1~~ Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately	① ③
Action a		AND A.2 ~~B.2.2~~ Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately	①
Action a		AND A.3 ~~B.2.3~~ Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately	①

CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
4.8.2.2 DOC L02 SR 3.8.5.1	-------------------------------NOTE------------------------------ The following SRs are not required to be performed: SR 3.8.4.2 and SR 3.8.4.3. -- For the DC source~~s~~ required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1 SR 3.8.4.2 SR 3.8.4.3	In accordance with applicable SRs ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.5, DC SOURCES - SHUTDOWN

1. The bracketed optional ISTS LCO 3.8.5 and "Reviewers Note" have been deleted since the current licensing basis only requires one DC electrical power subsystem to be OPERABLE. ISTS 3.8.5 ACTION A has been deleted since only one required DC electrical power train is specified in the LCO. This allowance is only acceptable if the first option of the LCO is used. The subsequent Condition and Required Actions have been renumbered and modified, as applicable.

2. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources - Shutdown

BASES

BACKGROUND

A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient ① analyses in the UFSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), ② assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6 and during movement of ~~[recently]~~ irradiated fuel ② assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel~~. ~~Due to radioactive decay, DC electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)].~~ ②

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many DBAs that are

BASES

APPLICABLE SAFETY ANALYSES (continued)

analyzed in MODES ~~[~~1, 2, 3, and 4~~]~~ have no specific analyses in MODES ~~[~~5 and 6~~]~~ because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems. ②

The shutdown Technical Specification requirements are designed to ensure that the unit has the capability to mitigate the consequences of certain postulated accidents. Worst case DBAs which are analyzed for operating MODES are generally viewed not to be a significant concern during shutdown MODES due to the lower energies involved. The Technical Specifications therefore require a lesser complement of electrical equipment to be available during shutdown than is required during operating MODES. More recent work completed on the potential risks associated with shutdown, however, have found significant risk associated with certain shutdown evolutions. As a result, in addition to the requirements established in the Technical Specifications, the industry has adopted NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," as an Industry initiative to manage shutdown tasks and associated electrical support to maintain risk at an acceptable low level. This may require the availability of additional equipment beyond that required by the shutdown Technical Specifications.

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

LCO

The DC electrical power subsystem~~s, [each required] [the required]~~ ~~subsystem~~ consisting of ~~two~~ one batter~~ies~~y, one required battery charger per battery, and the corresponding control equipment and interconnecting cabling within the subsystem, ~~[are]~~ ~~[~~is~~]~~ required to be OPERABLE to support ~~[required]~~ ~~[~~one~~]~~ subsystem~~[s]~~ of distribution systems required ~~[~~OPERABLE by LCO 3.8.10, "Distribution Systems - Shutdown."~~]~~ This ensures the availability of sufficient DC electrical power 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]~~). ② ① ②

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies provide assurance that: ②

a. Required features needed to mitigate a fuel handling ~~[involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~ accident are available, ②

b. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and

c. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.4.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

~~A.1, A.2, and A.3~~ ③

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~

~~ACTION A is included only when plant-specific implementation of LCO 3.8.5 includes the potential to require both subsystems of the DC System to be OPERABLE. If plant-specific implementation results in LCO 3.8.5 requiring only one subsystem of the DC System to be OPERABLE, then ACTION A is omitted and ACTION B is renumbered as ACTION A.~~ ④

~~---~~

~~Condition A represents one subsystem with one [or two] battery chargers inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1 requires that the battery terminal voltage be restored to greater than or~~ ③

BASES

ACTIONS (continued)

~~equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within [12] hours, the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability.~~

~~--------------------------------REVIEWER'S NOTE--------------------------------~~
~~A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).~~
~~--~~

~~A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within [12] hours, avoiding a premature shutdown with its own attendant risk.~~

~~If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting modes, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit modes that is necessary during the recovery period following a battery discharge event that the DC system is designed for.~~

~~If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within [12] hours (Required Action A.2).~~

③

BASES

ACTIONS (continued)

~~Required Action A.2 requires that the battery float current be verified as less than or equal to [2] amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it has now been fully recharged. If at the expiration of the initial [12] hour period the battery float current is not less than or equal to [2] amps this indicates there may be additional battery problems and the battery must be declared inoperable.~~

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Any licensee wishing to adopt a Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decision Making: Technical Specifications." Otherwise, the 72 hour Completion Time must be adopted.~~
~~--~~

③

~~Required Action A.3 limits the restoration time for the inoperable battery charger to [72] hours. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E battery charger). The [72] hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.~~

A.1, A.2, and A.3 ~~B.1, B.2.1, B.2.2, and B.2.3~~

With the required DC electrical power subsystem inoperable, the minimum required DC electrical power source is not available. Therefore, suspension of ③

~~[If two subsystems are required by LCO 3.8.10, the remaining subsystem with DC power available may be capable of supporting sufficient systems to allow continuation of [recently] irradiated fuel movement].~~ ② ~~By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS. In many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend~~ ③ movement of ~~[recently]~~ ② irradiated fuel assemblies, and operations involving positive reactivity additions~~)~~ that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6) is required. ① Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safety operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than ~~that~~ what ⑤

ACTIONS (continued)

would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron 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 shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystem~~[s]~~ and to continue this action until restoration is accomplished ② in order to provide the necessary DC electrical 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 DC electrical power subsystem~~s~~ should be completed as quickly as possible ① in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 states that Surveillances required by SR 3.8.4.1 through SR 3.8.4.3 are applicable in these MODES. See the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.

REFERENCES

1. U FSAR, Chapter ~~[~~6~~]~~.
2. U FSAR, Chapter ~~[~~15~~]~~.

② ①

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources - Shutdown

BASES

BACKGROUND

A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient ① ②
analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6 and during movement of ~~[recently]~~ irradiated fuel ②
assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel~~. ~~Due to radioactive decay, DC electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)].~~ ②

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many DBAs that are

BASES

APPLICABLE SAFETY ANALYSES (continued)

analyzed in MODES ~~[~~1, 2, 3, and 4~~]~~ have no specific analyses in MODES ~~[~~5 and 6~~]~~ because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems. ②

The shutdown Technical Specification requirements are designed to ensure that the unit has the capability to mitigate the consequences of certain postulated accidents. Worst case DBAs which are analyzed for operating MODES are generally viewed not to be a significant concern during shutdown MODES due to the lower energies involved. The Technical Specifications therefore require a lesser complement of electrical equipment to be available during shutdown than is required during operating MODES. More recent work completed on the potential risks associated with shutdown, however, have found significant risk associated with certain shutdown evolutions. As a result, in addition to the requirements established in the Technical Specifications, the industry has adopted NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," as an Industry initiative to manage shutdown tasks and associated electrical support to maintain risk at an acceptable low level. This may require the availability of additional equipment beyond that required by the shutdown Technical Specifications.

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

LCO

The DC electrical power subsystem~~s, [each required] [the required] subsystem~~ consisting of ~~two~~ one batter~~ies~~y, one required battery charger per battery, and the corresponding control equipment and interconnecting cabling within the subsystem, ~~[are] [~~is~~]~~ required to be OPERABLE to support ~~[required] [~~one~~]~~ subsystem~~[s]~~ of distribution systems required ~~[~~OPERABLE by LCO 3.8.10, "Distribution Systems - Shutdown."~~]~~ This ensures the availability of sufficient DC electrical power 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]~~). ② ① ②

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies provide assurance that: ②

a. Required features needed to mitigate a fuel handling ~~[involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~ accident are available, ②

b. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and

c. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.4.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

~~A.1, A.2, and A.3~~ ③

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~ACTION A is included only when plant-specific implementation of LCO 3.8.5 includes the potential to require both subsystems of the DC System to be OPERABLE. If plant-specific implementation results in LCO 3.8.5 requiring only one subsystem of the DC System to be OPERABLE, then ACTION A is omitted and ACTION B is renumbered as ACTION A.~~ ④
~~---~~

~~Condition A represents one subsystem with one [or two] battery chargers inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1 requires that the battery terminal voltage be restored to greater than or~~ ③

BASES

ACTIONS (continued)

~~equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within [12] hours, the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability.~~

~~--------------------------------REVIEWER'S NOTE--------------------------------~~
~~A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).~~
~~--~~

~~A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within [12] hours, avoiding a premature shutdown with its own attendant risk.~~ ③

~~If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting modes, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit modes that is necessary during the recovery period following a battery discharge event that the DC system is designed for.~~

~~If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within [12] hours (Required Action A.2).~~

BASES

ACTIONS (continued)

~~Required Action A.2 requires that the battery float current be verified as less than or equal to [2] amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it has now been fully recharged. If at the expiration of the initial [12] hour period the battery float current is not less than or equal to [2] amps this indicates there may be additional battery problems and the battery must be declared inoperable.~~

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Any licensee wishing to adopt a Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decision Making: Technical Specifications." Otherwise, the 72 hour Completion Time must be adopted.~~ ③
~~--~~

~~Required Action A.3 limits the restoration time for the inoperable battery charger to [72] hours. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E battery charger). The [72] hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.~~

A.1, A.2, and A.3 ~~B.1, B.2.1, B.2.2, and B.2.3~~ ③

With the required DC electrical power subsystem inoperable, the minimum required DC electrical power source is not available. Therefore, suspension of ~~[If two subsystems are required by LCO 3.8.10, the remaining subsystem with DC power available may be capable of supporting sufficient systems to allow continuation of [recently] irradiated fuel movement].~~ ② ~~By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS. In many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made~~ ③ ~~(i.e., to suspend~~ movement of ~~[recently]~~ irradiated fuel assemblies, and ② operations involving positive reactivity additions~~)~~ that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6) is required. ① Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safety operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than ~~that~~ what ⑤

BASES

ACTIONS (continued)

would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron 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 shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystem~~[s]~~ and to continue this action until restoration is accomplished ② in order to provide the necessary DC electrical 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 DC electrical power subsystem~~s~~ should be completed as quickly as possible ① in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 states that Surveillances required by SR 3.8.4.1 through SR 3.8.4.3 are applicable in these MODES. See the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.

REFERENCES

1. FSAR, Chapter ~~[~~6~~]~~.

U ② ①

2. FSAR, Chapter ~~[~~15~~]~~.

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.5 BASES, DC SOURCES - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Changes have been made to be consistent with changes made to the Specifications.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Typographical error corrected.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.5, DC SOURCES - SHUTDOWN

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 6

ITS 3.8.6, Battery Parameters

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

A01

ELECTRICAL POWER SYSTEMS

BATTERY PARAMETERS

~~D.C. DISTRIBUTION - OPERATING~~

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

LCO 3.8.6 3.8.2.3 As a minimum the following D.C. electrical sources shall be OPERABLE:

a. 125-volt D.C. bus No. 1A, 125-volt Battery bank No. 1A and a full capacity charger.

b. 125-volt D.C. bus No. 1B, 125-volt Battery bank No. 1B and a full capacity charger.

See ITS 3.8.4

See ITS 3.8.9

Applicability **APPLICABILITY**: ~~MODES 1, 2, 3 and 4.~~

When associated DC electrical power subsystems are required to be OPERABLE.

A02

ACTION:

See ITS 3.8.9

a. With one of the required battery banks or busses inoperable, restore the inoperable battery bank or bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.8.4

b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.3.2.a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

Add proposed ACTIONS A, B, C, D, E and F.

L01

SURVEILLANCE REQUIREMENTS

4.8.2.3.1 Each D.C. bus train shall be determined OPERABLE and energized in accordance with the Surveillance Frequency Control Program by verifying indicated power availability.

See ITS 3.8.9

4.8.2.3.2 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

See ITS 3.8.4

a. In accordance with the Surveillance Frequency Control Program by verifying that:

SR 3.8.6.1
SR 3.8.6.2
1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

See ITS 3.8.4

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.8.6.3
SR 3.8.6.4
SR 3.8.6.5

b. In accordance with the Surveillance Frequency Control Program ~~and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts,~~ by verifying that: L02

SR 3.8.6.3
SR 3.8.6.5

1. The parameters in Table 4.8-2 meet the Category B limits,

2. ~~There is no visible corrosion at either terminals or connectors, and~~ L03

SR 3.8.6.4

3. ~~The average electrolyte temperature of 10% (60 cells total) of connected cells is above 50°F~~. LA01

Each battery pilot cell temperature is greater than or equal to minimum established design limits.

c. In accordance with the Surveillance Frequency Control Program by verifying that:

1. ~~The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,~~

2. ~~The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material,~~

3. ~~Battery cell inter-connection resistance values are maintained at the values below:~~

~~Battery Inter-Connection Measurement Limits~~		
~~Battery Inter-Connection Type~~	~~Maximum Individual Inter-Connection Resistance~~	~~Maximum Average Inter-Connection Resistance [Battery Bank*]~~
~~Inter-Cell~~	~~≤ 150 x 10-6 ohms~~	~~≤ 50 x 10-6 ohms~~
~~Inter-Tier~~	~~≤ 200 x 10-6 ohms~~	
~~Inter-Rack~~	~~≤ 200 x 10-6 ohms~~	
~~Output Terminal~~	~~≤ 150 x 10-6 ohms~~	

~~* The battery bank average interconnection resistance limit is the average of all inter-cell, inter-tier, inter-rack and output terminal connection resistance measurements for all series connections in the battery string~~

~~and,~~

L03

4. The battery charger will supply at least 300 amperes at 140 volts for at least 6 hours.

See ITS 3.8.4

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

See ITS 3.8.4

d. In accordance with the Surveillance Frequency Control Program, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

Add proposed SR 3.8.6.6 NOTE

SR 3.8.6.6 e. In accordance with the Surveillance Frequency Control Program~~, during shutdown,~~ by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.3.2.d.

L04

L05

See ITS 3.8.4

SR 3.8.6.6 f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. ~~Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.~~

LA02

Add proposed SR 3.8.6.6 third Frequency

L06

ITS

A01

ITS 3.8.6

TABLE 4.8-2

BATTERY SURVEILLANCE REQUIREMENT

		CATEGORY A~~$^{(1)}$~~	CATEGORY B~~$^{(2)}$~~		
	Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable~~$^{(3)}$~~ value for each connected cell	L01
SR 3.8.6.3	Electrolyte Level	~~≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark~~	~~≥ Minimum level indication mark, and ≤ 1/4" above maximum level indication mark~~ greater than or equal to the minimum established design limits.	~~Above top of plates and not overflowing~~	L07 L01 LA03
SR 3.8.6.2 SR 3.8.6.5	Float Voltage	≥ ~~2.13~~ 2.07 volts	≥ 2.13 volts$^{(c)}$ See ITS 5.5.14	~~>~~ ≥ 2.07 volts	L08 L09
SR 3.8.6.1	~~Specific Gravity$^{(a)}$~~	~~≥ 1.195~~$^{(b)}$	~~≥ 1.190 Average of all connected cells > 1.200~~	~~Not more than .020 below the average of all connected cells~~ ~~Average of all connected cells~~ ~~≥ 1.190$^{(b)}$~~	L10

~~(a) Corrected for electrolyte temperature and level.~~

SR 3.8.6.1 (b) Or battery charging current is less than 2 amps when on charge.

(c) Corrected for average electrolyte temperature.

See ITS 5.5.14

~~(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.~~

~~(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within the limits within 7 days.~~

~~(3) With any Category B parameter not within its allowable value, declare the battery inoperable.~~

L01

ELECTRICAL POWER SYSTEMS

BATTERY PARAMETERS

~~D.C. DISTRIBUTION - SHUTDOWN~~

Add proposed LCO 3.8.6

LIMITING CONDITION FOR OPERATION

A02

LCO 3.8.6 3.8.2.4 As a minimum, the following D.C. electrical equipment and bus shall be energized and OPERABLE:

1 - 125-volt D.C. bus, and

1 - 125-volt battery bank and charger supplying the above D.C. bus.

See ITS 3.8.5 and 3.8.10

Applicability **APPLICABILITY**: ~~MODES 5 and 6.~~ When associated DC electrical power subsystems are required to be OPERABLE.

A02

ACTION:

With less than the above complement of D.C. equipment and bus OPERABLE, establish CONTAINMENT INTEGRITY within 8 hours.

See ITS 3.8.5 and 3.8.10

Add proposed ACTIONS A, B, C, D, E and F.

L01

SURVEILLANCE REQUIREMENTS

4.8.2.4.1 The above required 125-volt D.C. bus shall be determined OPERABLE and energized in accordance with the Surveillance Frequency Control Program by verifying indicated power availability.

See ITS 3.8.10

SR 3.8.6.1
SR 3.8.6.2
SR 3.8.6.3
SR 3.8.6.4
SR 3.8.6.5
SR 3.8.6.6

4.8.2.4.2 The above required 125-volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2.

ELECTRICAL POWER SYSTEMS

BATTERY PARAMETERS

3/4.8.2 ~~D.C. SOURCES~~

OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

LCO 3.8.4 3.8.2.1 ~~As a minimum the following D.C. electrical sources shall be OPERABLE:~~

~~a. 125-volt Battery bank No. 2A and a full capacity charger.~~

~~b. 125-volt Battery bank No. 2B and a full capacity charger.~~

See ITS 3.8.4

Applicability **APPLICABILITY**: ~~MODES 1, 2, 3, and 4.~~

When associated DC electrical power subsystems are required to be OPERABLE.

A02

ACTION:

a. With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 30 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN

b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.1a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

See ITS 3.8.4

Add proposed ACTIONS A, B, C, D, E and F.

L01

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

See ITS 3.8.4

a. In accordance with the Surveillance Frequency Control Program by verifying that:

SR 3.8.6.1
SR 3.8.6.2

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

See ITS 3.8.4

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.8.6.3
SR 3.8.6.4
SR 3.8.6.5

b. In accordance with the Surveillance Frequency Control Program ~~and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts,~~ by verifying that: L02

SR 3.8.6.3
SR 3.8.6.5

1. The parameters in Table 4.8-2 meet the Category B limits,

2. ~~There is no visible corrosion at either terminals or connectors, and~~ L03

SR 3.8.6.4

3. ~~The average electrolyte temperature of 10% (60 cells total) of connected cells is above 50°F.~~ LA01

Each battery pilot cell temperature is greater than or equal to minimum established design limits.

c. In accordance with the Surveillance Frequency Control Program by verifying that:

1. ~~The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,~~

2. ~~The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material,~~

3. ~~Battery cell inter-connection resistance values are maintained at the values below:~~

~~Battery Inter-Connection Measurement Limits~~		
~~Battery Inter-Connection Type~~	~~Maximum Individual Inter-Connection Resistance~~	~~Maximum Average Inter-Connection Resistance [Battery Bank*]~~
~~Inter-Cell~~	~~≤ 150 x 10-6 ohms~~	~~≤ 50 x 10-6 ohms~~
~~Inter-Tier~~	~~≤ 200 x 10-6 ohms~~	
~~Inter-Rack~~	~~≤ 200 x 10-6 ohms~~	
~~Output Terminal~~	~~≤ 150 x 10-6 ohms~~	

~~* The battery bank average interconnection resistance limit is the average of all inter-cell, inter-tier, inter-rack and output terminal connection resistance measurements for all series connections in the battery string~~

~~and,~~

L03

4. The battery charger will supply at least 300 amperes at 140 volts for at least 6 hours.

See ITS 3.8.4

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

See ITS 3.8.4

d. In accordance with the Surveillance Frequency Control Program, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

Add proposed SR 3.8.6.6 NOTE

L04

SR 3.8.6.6 e. In accordance with the Surveillance Frequency Control Program~~, during shutdown,~~ by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.

L05

See ITS 3.8.4

SR 3.8.6.6 f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. ~~Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.~~

LA02

Add proposed SR 3.8.6.6 third Frequency

L06

TABLE 4 8-2

BATTERY SURVEILLANCE REQUIREMENT

		CATEGORY A~~(1)~~	CATEGORY B~~(2)~~		
	Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable~~(3)~~ value for each connected cell	L01
SR 3.8.6.3	Electrolyte Level	~~> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark~~	~~> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark~~ greater than or equal to the minimum established design limits.	~~Above top of plates, and not overflowing~~	L07 L01 LA03
SR 3.8.6.2 SR 3.8.6.5	Float Voltage	≥ ~~2.13~~ 2.07 volts	≥ 2.13 volts(c) See ITS 5.5.14	~~≥~~ ≥ 2.07 volts	L08 L09
SR 3.8.6.1	~~Specific Gravity(a)~~	~~≥ 1.195~~(b)	~~≥ 1.190~~ ~~Average of all connected cells > 1.200~~	~~Not more than .020 below the average of all connected cells~~ ~~Average of all connected cells ≥ 1.190(b)~~	L10

~~(a) Corrected for electrolyte temperature and level.~~

SR 3.8.6.1 (b) Or battery charging current is less than 2 amps when on charge.

(c) Corrected for average electrolyte temperature.

See ITS 5.5.14

~~(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.~~

~~(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within the limits within 7 days.~~

~~(3) With any Category B parameter not within its allowable value, declare the battery inoperable.~~

L01

ELECTRICAL POWER SYSTEMS

BATTERY PARAMETERS

~~D.C. SOURCES~~

SHUTDOWN

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

3.8.2.2 As a minimum, one 125-volt battery bank and a full capacity charger shall be OPERABLE.

See ITS 3.8.5

Applicability

APPLICABILITY: ~~MODES 5 and 6.~~

When associated DC electrical power subsystems are required to be OPERABLE.

A02

ACTION:

a. With the required battery bank inoperable, immediately suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or boron concentration, or movement of irradiated fuel; initiate corrective action to restore the required battery bank to OPERABLE status as soon as possible, and within 8 hours, depressurize and vent the Reactor Coolant System through a 3.58 square inch vent.

b. With the required full capacity charger inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

See ITS 3.8.5

Add proposed ACTIONS A, B, C, D, E and F.

L01

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1
SR 3.8.6.2
SR 3.8.6.3
SR 3.8.6.4
SR 3.8.6.5
SR 3.8.6.6

4.8.2.2 The above required 125-volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.1.

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 Unit 1 CTS 3.8.2.3 and Unit 2 CTS 3.8.2.1 are applicable during MODES 1, 2, 3, and 4. Unit 1 CTS 3.8.2.4 and Unit 2 CTS 3.8.2.2 are applicable during MODES 5 and 6. ITS LCO 3.8.6 requires the battery parameters for the Train A and Train B DC electrical power subsystem batteries to be within limits when the associated DC electrical power subsystems are required to be OPERABLE. This changes the CTS by combining the requirements for the DC electrical subsystem battery parameters into one Specification and replacing the actual MODES with the phrase "When associated DC electrical power subsystems are required to be OPERABLE."

The purpose of ITS 3.8.6 is to provide battery parameter requirements for safety related batteries. This change combines Unit 1 CTS 3.8.2.3 and 3.8.2.4 and Unit 2 CTS 3.8.2.1 and 3.8.2.2 requirements for the DC electrical power subsystem battery parameters into one Specification. There are no technical changes as a result of this change since it converts the requirements into the format of the ITS. The proposed LCO states that the required battery's parameters shall be within limits. The proposed Applicability ensures the battery parameter requirements are met when the associated battery is required to be OPERABLE. Any technical changes to the battery parameters are discussed in a Discussion of Change specifically associated with that change. Any changes to the LCO and Applicability of the DC electrical power subsystem batteries are discussed in the Discussion of Changes for ITS 3.8.4 and 3.8.5. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS 4.8.2.3.2.b.3 and Unit 2 4.8.2.1.b.3 require, in part, verifying the average electrolyte temperature of 10% of connected cells above

50°F. ITS SR 3.8.6.4 requires, in part, verification that each required battery pilot cell temperature is greater than or equal to minimum established design limits. The pilot cell temperature for the minimum established design limits is moved to the technical specification Bases. This changes the CTS by moving the specified temperature value for this SR to the Bases.

The removal of these details related to battery electrolyte temperature limits from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety and the removed information will be adequately controlled in the ITS Bases. The Technical Specification Bases Control Program in Chapter 5 controls changes to the Bases. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications. Furthermore, the battery and its preventive maintenance and monitoring program are under the regulatory requirements of 10 CFR 50.65. This relocation will continue to assure that the battery is maintained at current levels of performance, and that operators appropriately focus on monitoring the battery parameters for degradation.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS 4.8.2.3.2.f and Unit 2 CTS 4.8.2.1.f require the performance of a battery performance test. The Surveillance requires a more frequent performance if the battery shows signs of "degradation" or has reached 85% of the service life expected for the application. The CTS further states that degradation is indicated when the battery capacity drops more than 10% from its capacity on previous performance tests or is below 90% of the manufacturer's rating. ITS SR 3.8.6.6 requires verification of the battery capacity when subjected to a performance discharge test or a modified performance discharge test. The Surveillance is also required more frequently when the battery shows degradation or has reached 85% of the expected life, but the definition of what constitutes "degradation" is not included. This changes the CTS by moving the detail on how degradation is determined from the CTS to the ITS Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. ITS SR 3.8.6.6 retains the requirement to verify the battery capacity when subjected to a performance discharge test or a modified performance discharge test. The Surveillance also requires more frequent performance when the battery shows degradation or has reached 85% of the expected life. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. The Technical Specification Bases Control Program in Chapter 5 controls changes to the Bases. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 4.8.1.1.3.b.1 and 4.8.2.3.2.b.1 require verification that battery electrolyte level is greater than the minimum level indication mark, and less than or equal to ¼ inch above maximum level indication mark at least once per 31 days for the safety related batteries. ITS SR 3.8.6.3 requires a similar Surveillance and specifies the acceptance criteria as "greater than or equal to the minimum established design limits." The minimum established design limits for battery electrolyte level will be placed in the technical specification Bases. This changes the CTS by moving the design detail for this SR from CTS to the Bases.

The removal of these details related to Surveillance Requirement limits from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. This Category B value of CTS Table 4.8-2 represent appropriate monitoring levels and appropriate preventive maintenance levels for long-term battery quality and extended battery life. Removing this design detail to the Bases is acceptable because these battery parameter values will continue to be controlled at their current level and the removed information will be adequately controlled in the ITS Bases. The Technical Specification Bases Control Program in Chapter 5 controls changes to the Bases. This program provides for the evaluation of changes to ensure the Bases are properly controlled. Furthermore, the battery and its preventive maintenance and monitoring program are under the regulatory requirements of 10 CFR 50.65. This relocation will continue to assure that the battery is maintained at current levels of performance, and that operators appropriately focus on monitoring the battery parameters for degradation. This change is designated as a less restrictive removal of detail change because the Surveillance limits are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* Unit 1 CTS 3.8.2.3 and 3.8.2.4 and Unit 2 CTS 3.8.2.1 and 3.8.2.2 provide ACTIONS and associated Completion Times for when a DC electrical power subsystem battery is inoperable due to battery parameters not within limits. In addition, CTS Table 4.8.2 provide in the form of Notes (1), (2), and (3), ACTIONS and associated Completions Times when Category A or Category B parameter limits or allowable values are exceeded. In lieu of these current Actions under these conditions, ITS 3.8.6 ACTIONS provide compensatory Required Actions and associated Completion Times when battery parameters are not within limits. This changes the CTS by replacing the current ACTIONS with new compensatory ACTIONS for battery parameters not within limits.

The purpose of Unit 1 CTS 3.8.2.3 and 3.8.2.4 and Unit 2 CTS 3.8.2.1 and 3.8.2.2 ACTIONS is to provide a finite period for continued operation when a safety related battery is inoperable due to battery parameters not within limits. ITS 3.8.6 ACTIONS also allow a certain amount of time to restore battery parameters to within limits before declaring the associated battery inoperable. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions to minimize risk associated with continued operation while providing time to correct degraded conditions. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features including the capacity and capability of remaining systems or features, time for repairs or replacement, and the low probability of a DBA occurring during the Completion Time. ACTIONS have been added to allow a short time period to restore battery parameters to within limits. The Note to the ACTIONS clarifies that separate Condition entry is allowed for each battery. This is acceptable since the Required Actions for each Condition provide appropriate compensatory actions for each battery parameter not within limits. Complying with the Required Actions for one inoperable battery may allow for continued operation, and a subsequent inoperable battery is governed by separate Condition entry and application of associated Required Actions. ITS 3.8.6 ACTION A covers the condition of one battery with one or more battery cells float voltage less than the specified limit and requires the performance of SR 3.8.4.1 within 2 hours, the performance of SR 3.8.6.1 within 2 hours, and restoration of the affected cell voltage to within limits within 24 hours. ITS 3.8.6 ACTION B covers the condition of one battery with float current not within the specified limit and requires the performance of SR 3.8.4.1 within 2 hours and restoration of the battery float current to within limits within 12 hours. ITS 3.8.6 ACTION C covers the condition of one battery with one or more cells electrolyte level less than minimum established design limits and requires the restoration of electrolyte level to above top of plates within 8 hours, verification that there is no evidence of leakage within 12 hours, and restoration of electrolyte level to greater than or equal to the minimum established design limits within 31 days. ITS 3.8.6 ACTION C NOTE requires Required Action C.2 to be completed if electrolyte level was below the top of plates. With electrolyte level below the top of the plates there is a potential for dryout and plate degradation; therefore, this Note requires verification of no evidence of leakage even if the level is increased above the top of the plates allowing the Condition to be exited. ITS 3.8.6 Required Action C.1 NOTE states that Required Actions C.1 and C.2 are only applicable if electrolyte level was below the top of the plates allowing 31 days to restore electrolyte level to greater than or equal to the minimum established design level. ITS 3.8.6 ACTION D covers the condition of one battery with pilot cell electrolyte temperature less than the minimum established design limits and requires the restoration of battery pilot cell temperature to greater than or equal to minimum established design limits within 12 hours. ITS 3.8.6 ACTION E covers the condition of two batteries with battery parameters not within limits and requires restoration of the battery parameters for one battery to within limits in 2 hours. ITS 3.8.6 ACTION F covers the conditions when a Required Action and associated Completion Time of any of the above ACTIONS cannot be met, if one or both batteries with one or more battery cells float voltage and float current are not within limits, or SR 3.8.6.6 is not met, and requires the immediate declaration that the associated battery is inoperable. The allowances are considered acceptable since only a short time is allowed to exist with battery parameters not within limits. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 7 – Relaxation of Surveillance Frequency)* Unit 1 CTS 4.8.2.3.2.b and Unit 2 CTS 4.8.2.1.b require the performance of several Surveillances within 7 days after a battery discharge (battery terminal voltage below 110 volts), or battery overcharge (battery terminal voltage above 150 volts). ITS 3.8.6 does not require these Surveillances to be performed after a battery discharge or overcharge. (See DOC L03 for the discussion on deleting the battery inspection requirements from CTS. See DOC L10 for the discussion on replacing the requirement to verify the battery cell specific gravity within limits to a requirement to verify battery float current within limits.) This changes the CTS by not including a specific Surveillance Requirement to perform these tests after a discharge or overcharge.

The purpose of the Unit 1 CTS 4.8.2.3.2.b and Unit 2 CTS 4.8.2.1.b Frequency is to ensure the batteries remain OPERABLE after a severe battery discharge or overcharge. This change is acceptable because the proposed Surveillance Requirement Frequency continues to ensure an acceptable level of equipment reliability. ITS SR 3.8.6.1 requires verification that each battery float current is ≤ 2 amps at a periodic frequency in accordance with the Surveillance Frequency Control Program. The float current requirements are based on the float current indicative of a charged battery. Therefore, this Surveillance will detect a discharge condition of the battery. In addition, ITS 5.5.14, "Battery Monitoring and Maintenance Program," requires a program for battery maintenance based on the recommendations of IEEE 450. The requirement to perform these battery preventative maintenance activities are consistent with IEEE 450, and as such, will be maintained in the plant procedures implementing ITS 5.5.14. This change is designated as less restrictive because Surveillances will be performed less frequently under ITS than under CTS.

L03 *(Category 5 – Deletion of Surveillance Requirement)* Unit 1 CTS 4.8.2.3.2.b.2 and Unit 2 CTS 4.8.2.1.b.2 require verification that there is no visible corrosion at either terminals or connectors. Unit 1 CTS 4.8.2.3.2.c and Unit 2 CTS 4.8.2.1.c, in part, require verification that the cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration, the cell-to-cell and terminal connections are clean, tight and coated with anti-corrosion material, and battery cell interconnection resistance values are maintained with defined limits. ITS 3.8.6 does not include these requirements for battery inspections, the removal of visible corrosion, and the verification that the battery-to-battery and terminal connections are clean, tight, and coated with anti-corrosion material. This changes the CTS by deleting the explicit battery requirements from the Technical Specifications.

The purpose of Unit 1 CTS 4.8.2.3.2.b.2 and CTS 4.8.2.3.2.c and Unit 2 CTS 4.8.2.1.b.2 and CTS 4.8.2.1.c is to ensure that proper preventative maintenance activities are performed on the safety related batteries. In accordance with ITS SR 3.0.1, when any SR is not met, the LCO is not met. This is based on the premise that SRs represent the minimum acceptable requirements for OPERABILITY of the required equipment. However, the failure to meet these specific Surveillances does not necessarily mean that the equipment is not capable of performing its safety function. When the batteries are capable of meeting ITS SR 3.8.4.1, the battery terminal voltage verification and ITS SR 3.8.4.3, the battery capacity test, they are considered to be able to meet their safety function. The Surveillances that are proposed to be deleted are considered preventative maintenance activities and are not considered the minimum acceptable requirements for OPERABILITY of the batteries. This change is acceptable because the SR requirements proposed in ITS 3.8.4

continue to ensure that the batteries are maintained consistent with the safety analyses and licensing basis. In addition, ITS 5.5.14, "Battery Monitoring and Maintenance Program," requires a program for battery maintenance based on the recommendations of IEEE 450. The requirement to perform these battery preventative maintenance activities are consistent with IEEE 450, and as such, will be maintained in plant procedures implementing ITS 5.5.14. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L04 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS surveillance requirements 4.8.2.3.2.e and 4.8.2.3.2.f and Unit 2 CTS surveillance requirements 4.8.2.1.e and 4.8.2.1.f require the performance of discharge tests verifying battery capacity in accordance with the Surveillance Frequency Control Program during shutdown. ITS SR 3.8.6.6, in part, requires the verification of battery capacity when subjected to a performance discharge test. A Note modifies the ITS SR. The Note states “This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR". This changes the CTS by allowing portions of the surveillance to be performed in MODES 1, 2, 3, or 4 (to confirm OPERABILITY) when an assessment determines safe plant operation can be maintained.

The purpose of the CTS requirement to perform the required surveillance during shutdown conditions is to assure plant safety. The ITS SR note allows the SR to be conducted during power operation but only if the performance of the SR does not reduce plant safety. The proposed change is acceptable because it continues to adequately verify that the equipment used to meet the LCO can perform its required functions while assuring the plant is operated safely. The allowance to perform the SR in MODE 1, 2, 3, or 4 is accompanied by the requirement to assess the impact on safety prior to performing the SR. The requirement to assess the impact on the safe operation of the plant provides additional assurance that plant safety will not be decreased. Thus, the proposed ITS relaxation for performing this SR at power is balanced by the additional requirement to assure safe plant operation. The proposed ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L05 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS 4.8.2.3.2.e and Unit 2 CTS 4.8.2.1.e require the performance of a battery performance discharge test on the batteries. ITS SR 3.8.6.6 requires the performance of a performance discharge test or a modified performance discharge test. This changes the CTS by adding the allowance to perform a modified performance discharge test instead of the performance discharge test.

The purpose of Unit 1 CTS 4.8.2.3.2.e and Unit 2 CTS 4.8.2.1.e is to determine overall battery degradation due to age and usage. A performance test, as defined in IEEE 450, is a constant-current or constant-power capacity test made on a battery after it has been in service, to detect any change in the capacity. A modified performance test, as defined in IEEE 450, is a test, in the "as found" condition, of battery capacity and the ability of the battery to satisfy the duty cycle. Both tests, performance discharge test or modified performance discharge test, monitor the battery capacity. IEEE 450, as endorsed by RG 1.129-2007, states that a modified performance test is a test of battery capacity using a constant current, modified by increasing the current to bound the currents in the duty cycle. Deviations from the constant-current test, which increase the current, are acceptable. IEEE 450 also states that a modified performance test can be used in lieu of a service test and/or a performance test at any time. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are acceptable for verification that the equipment used to meet the LCO can perform its required functions. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L06 *(Category 7 – Relaxation of Surveillance Frequency)* Unit 1 CTS 4.8.2.3.2.f and Unit 2 CTS 4.8.2.1.f require an increased Frequency from that in Unit 1 CTS 4.8.2.3.2.e and Unit 1 CTS 4.8.2.1.e for battery performance tests if the battery shows signs of degradation or has reached 85% of its expected service life. ITS SR 3.8.6.6 provides two Frequencies when a battery has reached 85% of its expected service life based on whether the battery's remaining capacity is less than 100% or not. If the battery's remaining capacity is less than 100% of the manufactures rating, the required discharge test is performed every 12 months (annually). If the battery's remaining capacity is greater than or equal to 100% of the manufacturer’s rating, then the required discharge test is performed every 24 months. This changes the CTS by relaxing the Frequency of required discharge tests when the battery has reached 85% of its expected service life.

The purpose of Unit 1 CTS 4.8.2.3.2.f and Unit 2 CTS 4.8.2.1.f is to verify the battery capacity is acceptable on batteries that show signs of degradation or have reached 85% of the service life. ITS 3.8.6.6 provides an alternative Frequency if the battery that has reached 85% of its service life but has not shown signs of degradation and has a capacity of greater than or equal to 100% of the manufacture’s rating. This relaxed frequency is acceptable because the battery has not shown signs of degradation, retains greater than or equal to the manufacturer’s rated capacity, and is being tested at a more frequent periodicity than a battery that has not reached 85% of the service life expected. Also, IEEE 450 states that if the battery has reached 85% of service life, delivers a capacity of 100% or greater of the manufacturer’s rated capacity, and has shown no signs of degradation, performance testing at two-year intervals is acceptable until the battery shows signs of degradation. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L07 *(Category 5 – Deletion of Surveillance Requirement)* Unit 1 CTS 4.8.2.3.2.a.1 and Unit 2 CTS 4.8.2.1.a.1 require verifying the parameters in Table 4.8-1a meet Category A limits in accordance with the Surveillance Frequency Control Program. CTS Table 4.8-2 Category A contains the parameter 'Electrolyte Level' with the limit for each designated pilot cell set at "> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark." Unit 1 CTS 4.8.2.3.2.b.1 and Unit 2 CTS 4.8.2.1.a.1 require verifying the parameters in Table 4.8-2 meet Category B limits in accordance with the Surveillance Frequency Control

Program. CTS Table 4.8-2 Category B contains the parameter 'Electrolyte Level' with the limit for each connected cell set at "> Minimum level indication mark, and ≤ 1/4" above maximum level indication mark." In addition, the Category B electrolyte level Allowable Value for each connected cell (which includes the pilot cells) is above the top of plates, and not overflowing. ITS SR 3.8.6.3 requires verifying each battery connected cell electrolyte level is greater than or equal to minimum established design limits in accordance with the Surveillance Frequency Control Program. This changes the CTS by deleting the requirement to verify the pilot cells electrolyte level is within limits.

The purpose of CTS Category A limit on pilot cell electrolyte level and its related Frequency is to represent appropriate monitoring levels and appropriate preventive maintenance levels for long-term battery quality and extended battery life. The definition of Limiting Condition for Operation (LCO) presented in 10 CFR 50.36 states that LCOs are "the lowest functional capability or performance levels of equipment required for safe operation of the facility." As such, the Category A value for cell electrolyte level does not reflect the 10 CFR 50.36 criteria for LCOs. ITS 5.5.14, Battery Monitoring and Maintenance Program," requires a program providing controls for battery restoration and maintenance that shall be in accordance with IEEE 450 as endorsed by Regulatory Guide 1.129, with exceptions as applicable. IEEE 450 contains, in part, guidance on monitoring electrolyte level with the intention of providing recommended maintenance, test schedules, and testing procedures that can be used to optimize the life and performance of permanently installed, vented lead-acid storage batteries used for standby power applications. These values and actions associated with restoration are being replaced by a licensee-controlled program, required and described in TS Section 5.5, "Programs and Manuals," and titled the "Battery Monitoring and Maintenance Program." This provides adequate assurance that necessary battery parameter values will continue to be controlled and actions will be implemented if the battery parameter values are not met. Furthermore, the battery and its preventive maintenance and monitoring program are under the regulatory requirements of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants." This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L08 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS 4.8.2.3.2.a.1 and Unit 2 CTS 4.8.2.1.a.1 require verification that the pilot cell voltage is ≥ 2.13 V. ITS SR 3.8.6.2 requires the verification that each pilot cell voltage is ≥ 2.07 V. ITS 3.8.6 ACTION A addresses the condition in which one or more batteries with one or more battery cells float voltage less than 2.07 V. Once ACTION A has been entered, the battery cell is considered degraded and the Required Actions are to perform SR 3.8.4.1 and SR 3.8.6.1 within 2 hours. This changes the CTS by reducing the acceptance criterion for the pilot cell voltage limit from ≥ 2.13 V to ≥ 2.07 V.

The purpose of the proposed Surveillance limit in ITS SR 3.8.6.2 is to ensure the cell voltages are greater than or equal to the short-term absolute minimum voltage. Optimal long-term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge which could eventually render the battery inoperable. Float voltages in this range or less, but greater than 2.07 V per cell, are addressed in the Battery Monitoring and Maintenance Program. Furthermore, the Battery Monitoring and Maintenance Program includes actions to restore battery cells with float voltage less than 2.13 V and actions to verify that the remaining cells are greater than or equal to 2.07 V when a cell or cells have been found to be less than 2.13 V. A cell voltage of 2.07 V or below under float conditions may indicate internal cell problems while prolonged operation of cells below 2.13 V has the potential to reduce the life expectancy of cells. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. At the lower proposed voltage, the cell can still perform its function. The battery is considered OPERABLE when the battery voltage on float is greater than or equal to the minimum establish voltage of ITS SR 3.8.4.1. This change is acceptable since ITS 5.5.14, "Battery Monitoring and Maintenance Program," requires actions to be taken to restore battery cells with float voltage < 2.13 V. This program helps ensure the cell voltage will not approach the limit of 2.07 V and that the minimum established voltage of ITS SR 3.8.4.1 is maintained. This change is designated as less restrictive because a less stringent Surveillance Requirement acceptance criterion is being applied in the ITS than applied in the CTS.

L09 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* Unit 1 CTS 4.8.2.3.2.b.1 and Unit 2 CTS 4.8.2.1.b.1 require verification that each connected cell voltage is > 2.07 V in accordance with the Surveillance Frequency Control Program. ITS SR 3.8.6.5 requires the verification that each connected cell voltage is ≥ 2.07 V. This changes the CTS by reducing the acceptance criteria for each connected cell voltage limit from > 2.07 V to ≥ 2.07 V.

The purpose of Unit 1 CTS 4.8.2.3.2.b.1 and Unit 2 CTS 4.8.2.1.b.1 is to verify each connected cell voltage > 2.07 V, thereby establishing a minimum value for battery OPERABILITY. The purpose of the ITS 3.8.6.5 requirement to verify each connected cell voltage is ≥ 2.07 V is also to establish a minimum value for battery OPERABILITY. Optimal long-term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, which corresponds to 2.06 V per cell. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltages in this range or less, but greater than 2.07 V per cell, are addressed in the Battery Monitoring and Maintenance Program. Furthermore, the Battery Monitoring and Maintenance Program includes actions to restore battery cells with float voltage less than 2.13 V and actions to verify that the remaining cells are greater than or equal to 2.07 V when a cell or cells have been found to be less than 2.13 V. The 2.07 V per individual cell limit reflects the OPERABILITY limit for the batteries. With all battery cells at or above 2.07 V, there is adequate assurance that that the terminal voltage is at an acceptable threshold for establishing battery OPERABILITY. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L10 *(Category 5 – Deletion of Surveillance Requirement)* Unit 1 CTS 4.8.2.3.2.a.1 and Unit 2 CTS 4.8.2.1.a.1 require verification the pilot cell specific gravity is within the Category A limits of Table 4.8-2, as modified by footnote (a)). Unit 1 CTS 4.8.2.3.2.b.1 and Unit 2 CTS 4.8.2.1.b.1 require verification that each connected cell specific gravity is within the Category B limits of Table 4.8-2. As indicated in CTS Table 4.8-2 (footnote (a)), the specific gravity limit must be corrected for electrolyte temperature and level. ITS 3.8.6 does not include these Surveillances. This changes the CTS by deleting the Surveillances to verify battery cell specific gravity.

The purpose of Unit 1 CTS 4.8.2.3.2.a.1 and CTS 4.8.2.3.2.b.1 and Unit 2 CTS 4.8.2.1.a.1 and CTS 4.8.2.1.b.1 is to ensure the state of charge of each battery cell. This change is acceptable because the deleted Surveillance Requirements are not necessary to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a Frequency necessary to give confidence that the equipment can perform its assumed safety function. While the specified Surveillances have been deleted, the alternative Surveillance of CTS Table 4.8-2 footnote (b), to verify battery charging current < 2 amps is retained in ITS as SR 3.8.6.1, with modifications to the acceptance criteria to reflect the information provided by the battery manufacturer. IEEE 450 states that the most accurate indicator of return to full charge is a stabilized charging or float current. Specific gravity readings may not be accurate when the battery is on charge following a discharge. Therefore, ITS SR 3.8.6.1 gives a better indication of the overall battery condition. This change is designated as less restrictive because Surveillances which are required in CTS will not be required in ITS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

3.8.2.3
3.8.2.4

LCO 3.8.6 Battery parameters for the Train A and Train B electrical power subsystem batteries shall be within limits.

Applicability

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

---NOTE---

Separate Condition entry is allowed for each battery.

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
DOC L01	A. One ~~[or two]~~ batter~~[~~y]~~[ies on one subsystem]~~ with one or more battery cells float voltage < ~~[~~2.07~~]~~ V.	A.1	Perform SR 3.8.4.1.	2 hours	②
		<u>AND</u>			
		A.2	Perform SR 3.8.6.1.	2 hours	
		<u>AND</u>			
		A.3	Restore affected cell voltage ≥ ~~[~~2.07~~]~~ V.	24 hours	②
DOC L01	B. One ~~[or two]~~ batter~~[~~y~~][ies on one subsystem]~~ with float current > ~~[~~2~~]~~ amps.	B.1	Perform SR 3.8.4.1.	2 hours	②
		<u>AND</u>			
		B.2	Restore battery float current to ≤ ~~[~~2~~]~~ amps.	~~[~~12~~]~~ hours	

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L01	C. ------------NOTE------------ Required Action C.2 shall be completed if electrolyte level was below the top of plates. -------------------------------- One ~~[or two]~~ batter[y]~~[ies on one subsystem]~~ with one or more cells electrolyte level less than minimum established design limits.	--------------------NOTE------------------- Required Actions C.1 and C.2 are only applicable if electrolyte level was below the top of plates. --		
		C.1 Restore electrolyte level to above top of plates.	8 hours	②
		AND		
		C.2 Verify no evidence of leakage.	12 hours	
		AND		
		C.3 Restore electrolyte level to greater than or equal to minimum established design limits.	31 days	
DOC L01	D. One ~~[or two]~~ batter[y]~~[ies on one subsystem]~~ with pilot cell electrolyte temperature less than minimum established design limits.	D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours	②
DOC L01	E. Two ~~One or more~~ batteries ~~in redundant subsystems~~ with battery parameters not within limits.	E.1 Restore battery parameters for one battery~~ies in~~ ~~subsystem~~ to within limits.	2 hours	①

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L01	F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met. OR One [or ~~two]~~ both batter~~[y]~~[ies ~~on one subsystem]~~ with one or more battery cells float voltage < [2.07] V and float current > [2] amps. OR SR 3.8.6.6 not met.	F.1 Declare associated battery inoperable.	Immediately	② ③

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
4.8.2.3.2.a.1 4.8.2.4.2	SR 3.8.6.1 -----NOTE----- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ [2] amps.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.2.3.2.a.1 4.8.2.4.2	SR 3.8.6.2	Verify each battery pilot cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②
4.8.2.3.2.b.1 4.8.2.4.2	SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②
4.8.2.3.2.b.3 4.8.2.4.2	SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②
4.8.2.3.2.b.1 4.8.2.4.2	SR 3.8.6.5	Verify each battery connected cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②

CTS

SURVEILLANCE REQUIREMENTS (continued)

DOC L04

4.8.2.3.2.e
4.8.2.3.2.f
4.8.2.4.2

DOC L05

DOC L06

	SURVEILLANCE	FREQUENCY
SR 3.8.6.6	------------------------------NOTE------------------------------ This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, portions of this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. --	
	Verify battery capacity is ≥ ~~[~~80%~~]~~ of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	~~[60 months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ ② AND 12 months when battery shows degradation, or has reached ~~[~~85~~]~~% of the expected life with capacity < 100% of manufacturer's rating ② AND 24 months when battery has reached ~~[~~85~~]~~% of the expected life with capacity ≥ 100% of manufacturer's rating ②

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

3.8.2.3
3.8.2.4

LCO 3.8.6 Battery parameters for the Train A and Train B electrical power subsystem batteries shall be within limits.

Applicability

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

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

DOC L01

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ~~[or two]~~ batter~~[~~y~~][ies on one subsystem]~~ with one or more battery cells float voltage < ~~[~~2.07~~]~~ V.	A.1 Perform SR 3.8.4.1.	2 hours ②
	AND	
	A.2 Perform SR 3.8.6.1.	2 hours
	AND	
	A.3 Restore affected cell voltage ≥ ~~[~~2.07~~]~~ V.	24 hours ②
B. One ~~[or two]~~ batter~~[~~y~~][ies on one subsystem]~~ with float current > ~~[~~2~~]~~ amps.	B.1 Perform SR 3.8.4.1.	2 hours ②
	AND	
	B.2 Restore battery float current to ≤ ~~[~~2~~]~~ amps.	~~[~~12~~]~~ hours

DOC L01

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L01	C. ------------NOTE------------ Required Action C.2 shall be completed if electrolyte level was below the top of plates. -------------------------------- One ~~[or two]~~ batter[y]~~[ies on one subsystem]~~ with one or more cells electrolyte level less than minimum established design limits.	------------------NOTE------------------ Required Actions C.1 and C.2 are only applicable if electrolyte level was below the top of plates. --		
		C.1 Restore electrolyte level to above top of plates.	8 hours	②
		AND		
		C.2 Verify no evidence of leakage.	12 hours	
		AND		
		C.3 Restore electrolyte level to greater than or equal to minimum established design limits.	31 days	
DOC L01	D. One ~~[or two]~~ batter[y]~~[ies on one subsystem]~~ with pilot cell electrolyte temperature less than minimum established design limits.	D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours	②
DOC L01	E. ~~One or more~~ Two batteries ~~in redundant subsystems~~ with battery parameters not within limits.	E.1 Restore battery parameters for one batter~~ies in~~y ~~subsystem~~ to within limits.	2 hours	①

CTS

ACTIONS (continued)

DOC L01

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met. OR One ~~[~~or ~~two]~~ both batter~~[~~y~~][~~ies ~~on one subsystem]~~ with one or more battery cells float voltage < ~~[~~2.07~~]~~ V and float current > ~~[~~2~~]~~ amps. OR SR 3.8.6.6 not met.	F.1 Declare associated battery inoperable.	Immediately

② ③

SURVEILLANCE REQUIREMENTS

4.8.2.3.2.a.1
4.8.2.4.2

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	-----------------------------NOTE----------------------------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. --- Verify each battery float current is ≤ ~~[~~2~~]~~ amps.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

②

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.2.3.2.a.1 4.8.2.4.2	SR 3.8.6.2	Verify each battery pilot cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	②
4.8.2.3.2.b.1 4.8.2.4.2	SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	②
4.8.2.3.2.b.3 4.8.2.4.2	SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	②
4.8.2.3.2.b.1 4.8.2.4.2	SR 3.8.6.5	Verify each battery connected cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	②

CTS

SURVEILLANCE REQUIREMENTS (continued)

DOC L04

4.8.2.3.2.e
4.8.2.3.2.f
4.8.2.4.2

DOC L05

DOC L06

SURVEILLANCE		FREQUENCY
SR 3.8.6.6	------------------------------NOTE------------------------------ This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, portions of this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---	
	Verify battery capacity is ≥ ~~[~~80%~~]~~ of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	~~[60 months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ② AND 12 months when battery shows degradation, or has reached ~~[~~85~~]~~% of the expected life with capacity < 100% of manufacturer's rating ② AND 24 months when battery has reached ~~[~~85~~]~~% of the expected life with capacity ≥ 100% of manufacturer's rating ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.6, BATTERY PARAMETERS

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. ISTS SR 3.8.6.6 requires a battery performance discharge or modified performance discharge test to be performed and provides acceptance criteria. However, no ACTION is provided in the ISTS 3.8.6 ACTIONS for when this SR is not met. Thus in the ISTS, LCO 3.0.3 would have to be entered. To preclude an LCO 3.0.3 entry, ISTS 3.8.6 Condition F has been modified to cover the case when SR 3.8.6.6 is not met. ACTION F will require the associated battery to be declared inoperable. This is also consistent with the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND

This LCO delineates the limits on battery float current as well as electrolyte temperature, level, and float voltage for the DC power subsystem batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3. 8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown." In addition to the limitations of this Specification, the ~~[licensee controlled program]~~ Battery Monitoring and Maintenance Program also implements a program specified in Specification 5.5.1~~6~~4 for monitoring various battery parameters. ② ③

The battery cells are of flooded lead acid construction with a nominal specific gravity of ~~[~~1.215~~]~~ 123.8. This specific gravity corresponds to an open circuit battery voltage of approximately ~~120~~ 123.8 V for ~~[58]~~ 60 cell battery (i.e., cell voltage of ~~[2.065]~~ 2.063 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. ~~Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions.~~ Optimal long term performance however, is obtained by maintaining a recommended float voltage ~~[~~2.20 to 2.25~~]~~ Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge. The nominal float voltage of ~~[2.22]~~ 2.20 to 2.25 Vpc corresponds to a total float voltage output of ~~[128.8]~~ 132 V to 135 V for a ~~[58]~~ 60 cell battery ~~as discussed in the FSAR, Chapter [8] (Ref. 2)~~. ② ④ ① ② ①

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter ~~[~~6~~]~~ (Ref. 3) and Chapter ~~[~~15~~]~~ (Ref. 4), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. ① ②

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining at least one subsystem of DC sources OPERABLE during accident conditions, in the event of:

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

b. A worst-case single failure.

Battery parameters satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

Battery parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. Battery parameter limits are conservatively established, allowing continued DC electrical system function even with limits not met. Additional preventative maintenance, testing, and monitoring performed in accordance with the ~~[licensee controlled program]~~ Battery Monitoring and Maintenance Program is conducted as specified in Specification 5.5.1~~6~~ 4. ② ③

APPLICABILITY

The battery parameters are required solely for the support of the associated DC electrical power subsystems. Therefore, battery parameter limits are only required when the DC power source is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.8.4 and LCO 3.8.5.

ACTIONS

Insert 1 ①

A.1, A.2, and A.3

With one or more cells in one battery ~~or more batteries in one subsystem~~ < ~~[~~2.07~~]~~ V, the battery cell is degraded. Within 2 hours verification of the required battery charger OPERABILITY is made by monitoring the battery terminal voltage (SR 3.8.4.1) and of the overall battery state of charge by monitoring the battery float charge current (SR 3.8.6.1). This assures that there is still sufficient battery capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of one or more cells in one or more batteries < ~~[~~2.07~~]~~ V, and continued operation is permitted for a limited period up to 24 hours. ⑥ ② ②

Since the Required Actions only specify "perform," a failure of SR 3.8.4.1 or SR 3.8.6.1 acceptance criteria does not result in this Required Action not met. However, if one of the SRs is failed the appropriate Condition(s), depending on the cause of the failures, is entered. If SR 3.8.6.1 is failed then there is no assurance that there is still sufficient battery capacity to perform the intended function and the battery must be declared inoperable immediately.

B.1 and B.2

One battery ~~or more batteries in one subsystem~~ with float current > ~~[~~2~~]~~ amps indicates that a partial discharge of the battery capacity has occurred. This may be due to a temporary loss of a battery charger or possibly due to one or more battery cells in a low voltage condition reflecting some loss of capacity. Within 2 hours verification of the required battery charger OPERABILITY is made by monitoring the battery terminal voltage. If the terminal voltage is found to be less than the minimum established float voltage there are two possibilities, the battery charger is inoperable or is ⑥ ②

①

Insert 1

The Note to the ACTIONS clarifies that separate Condition entry is allowed for each battery. This is acceptable since the Required Actions for each Condition provide appropriate compensatory actions for each battery parameter not within limits. Complying with the Required Actions for one inoperable battery may allow for continued operation, and a subsequent inoperable battery is governed by separate Condition entry and application of associated Required Actions.

ACTIONS (continued)

operating in the current limit mode. Condition A addresses charger inoperability. If the charger is operating in the current limit mode after 2 hours that is an indication that the battery has been substantially discharged and likely cannot perform its required design functions. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within
~~[~~12~~]~~ hours (Required Action B.2). The battery must therefore be declared ②
inoperable.

If the float voltage is found to be satisfactory but there are one or more
battery cells with float voltage less than ~~[~~2.07~~]~~ V, the associated "<u>OR</u>" ②
statement in Condition F is applicable and the battery must be declared
inoperable immediately. If float voltage is satisfactory and there are no
cells less than ~~[~~2.07~~]~~ V there is good assurance that, within ~~[~~12~~]~~ hours, the ②
battery will be restored to its fully charged condition (Required Action B.2) from any discharge that might have occurred due to a temporary loss of the battery charger.

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).~~ ⑤
~~---~~

A discharged battery with float voltage (the charger setpoint) across its terminals indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery
within ~~[~~12~~]~~ hours, avoiding a premature shutdown with its own attendant ②
risk.

If the condition is due to one or more cells in a low voltage condition but
still greater than ~~[~~2.07~~]~~ V and float voltage is found to be satisfactory, this
is not indication of a substantially discharged battery and ~~[~~12~~]~~ hours is a ②
reasonable time prior to declaring the battery inoperable.

BASES

ACTIONS (continued)

Since Required Action B.1 only specifies "perform," a failure of SR 3.8.4.1 acceptance criteria does not result in the Required Action not met. However, if SR 3.8.4.1 is failed, the appropriate Condition(s), depending on the cause of the failure, is entered.

C.1, C.2, and C.3

battery

With one ~~or more batteries in one subsystem~~ with one or more cells electrolyte level above the top of the plates, but below the minimum established design limits, the battery still retains sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of electrolyte level not met. Within 31 days the minimum established design limits for electrolyte level must be re-established. ⑥

With electrolyte level below the top of the plates there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential (as well as provisions in Specification 5.5.1~~6~~, Battery Monitoring and Maintenance Program). They are modified by a Note that indicates they are only applicable if electrolyte level is below the top of the plates. Within 8 hours level is required to be restored to above the top of the plates. The Required Action C.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.1~~6~~.b item to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from IEEE Standard 450. They are performed following the restoration of the electrolyte level to above the top of the plates. Based on the results of the manufacturer's recommended testing the batter[y]~~[ies]~~ may have to be declared inoperable and the affected cell~~[s]~~ replaced.

4 4 ③ , ① ②

D.1

battery

With one ~~or more batteries in one subsystem~~ with pilot cell temperature less than the minimum established design limits, 12 hours is allowed to restore the temperature to within limits. A low electrolyte temperature limits the current and power available. Since the battery is sized with margin, while battery capacity is degraded, sufficient capacity exists to perform the intended function and the affected battery is not required to be considered inoperable solely as a result of the pilot cell temperature not met. ⑥

BASES

ACTIONS (continued)

E.1

With ~~one or more~~ two batteries ~~in redundant subsystems~~ with battery parameters not within limits there is not sufficient assurance that battery capacity has not been affected to the degree that the batteries can still perform their required function, given that redundant batteries are involved. With redundant batteries involved this potential could result in a total loss of function on multiple systems that rely upon the batteries. The longer Completion Times specified for battery parameters on ~~non-redundant batteries~~ one battery not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one ~~subsystem~~ battery within 2 hours. ⑥ ①

F.1

With one or more batteries with any battery parameter outside the allowances of the Required Actions for Condition A, B, C, D, or E, or failure of the battery performance discharge test (SR 3.8.6.6), sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding battery must be declared inoperable. Additionally, discovering one or ~~more~~ both batteries ~~in one subsystem~~ with one or more battery cells float voltage less than ~~[~~2.07~~]~~ V and float current greater than ~~[~~2~~]~~ amps indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately. ① ②

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. 1). ~~[The 7 day Frequency is consistent with IEEE-450 (Ref. 1).~~

~~OR~~ ②

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑤
~~--]~~ ②

This SR is modified by a Note that states the float current requirement is not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. When this float voltage is not maintained the Required Actions of LCO 3.8.4 ACTION A are being taken, which provide the necessary and appropriate verifications of the battery condition. Furthermore, the float current limit of ~~[~~2~~]~~ amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained. ②

SR 3.8.6.2 and SR 3.8.6.5

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum ~~established design~~ allowable limit~~s~~ provided by the battery manufacturer, which corresponds to ~~[130.5] V at the battery terminals~~ 127.2 V for a 60 cell battery, or ~~[2.25]~~ 2.12 Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltages in this range or less, but greater than ~~[~~2.07~~]~~ Vpc, are addressed in Specification 5.5.1~~6~~4. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are equal to or greater than the short term absolute minimum voltage of ~~[~~2.07~~]~~ V. ~~[The Frequency for cell voltage verification every 31 days for pilot cell and 92 days for each connected cell is consistent with IEEE-450 (Ref. 1).~~ ① ② ③

~~OR~~ ②

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

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑤
~~--]~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

Electrolyte level is monitored as part of the "Battery Monitoring and Maintenance Program" (ITS 5.5.14). Level is maintained above the top of the plates with Action taken when level is ≤ ¼" above the maximum level indication mark.

SR 3.8.6.3

The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. ~~[The Frequency of 31days is consistent with IEEE-450 (Ref. 1).~~

~~OR~~

②

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

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ ⑤ ②

SR 3.8.6.4

This Surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., ~~[40]~~ 50 °F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. ~~[The Frequency of 31 days is consistent with IEEE-450 (Ref. 1).~~ ②

~~OR~~

②

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

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ ⑤ ②

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.6

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

Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.6.6; however, only the modified performance discharge test may be used to satisfy the battery service test requirements of SR 3.8.4.3.

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

It may consist of just two rates; for instance the one minute rate for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test, both of which envelope the duty cycle of the service test. Since the ampere-hours removed by a one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test must remain above the minimum battery terminal voltage specified in the battery service test for the duration of time equal to that of the service test.

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 1) and IEEE-485 (Ref. 5). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this ~~[~~80~~]~~% limit. ②

~~[The Surveillance Frequency for this test is normally 60 months.~~ ②

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑤
~~--]~~ ②

If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's ratings. Degradation is indicated, according to IEEE-450 (Ref. 1), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is ≥ ~~[~~10%~~]~~ below the manufacturer's rating. ② These Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1).

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 2, 3, or 4 ~~or 2~~ is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 ~~or 2~~ 2, 3, or 4. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR. ⑥ ①

BASES

REFERENCES

1. IEEE-450.
2. FSAR, Chapter ~~[~~8~~]~~.

U

3. FSAR, Chapter ~~[~~6~~]~~.

U

4. FSAR, Chapter ~~[~~15~~]~~.

②

5. IEEE-485~~-[~~1983~~], June 1983~~. ① ②

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND

This LCO delineates the limits on battery float current as well as electrolyte temperature, level, and float voltage for the DC power subsystem batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3. 8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown." In addition to the limitations of this Specification, the ~~[licensee controlled program]~~ Battery Monitoring and Maintenance Program also implements a program specified in Specification 5.5.1~~6~~4 for monitoring various battery parameters. ② ③

The battery cells are of flooded lead acid construction with a nominal specific gravity of ~~[~~1.215~~]~~. This specific gravity corresponds to an open circuit battery voltage of approximately ~~120~~ 123.8 V for ~~[58]~~ 60 cell battery (i.e., cell voltage of ~~[2.065]~~ 2.063 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. ~~Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions.~~ Optimal long term performance however, is obtained by maintaining a recommended float voltage ~~[~~2.20 to 2.25~~]~~ Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge. The nominal float voltage of ~~[2.22]~~ 2.20 to 2.25 Vpc corresponds to a total float voltage output of ~~[128.8]~~ 132 V to 135 V for a ~~[58]~~ 60 cell battery ~~as discussed in the FSAR, Chapter [8] (Ref. 2)~~. ② ④ ① ② ①

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 3) and Chapter ~~[~~15~~]~~ (Ref. 4), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. ① ②

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining at least one subsystem of DC sources OPERABLE during accident conditions, in the event of:

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

b. A worst-case single failure.

Battery parameters satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Battery parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. Battery parameter limits are conservatively established, allowing continued DC electrical system function even with limits not met. Additional preventative maintenance, testing, and monitoring performed in accordance with the ~~[licensee controlled program]~~ Battery Monitoring and Maintenance Program is conducted as specified in Specification 5.5.1~~6~~4. ② ③

APPLICABILITY

The battery parameters are required solely for the support of the associated DC electrical power subsystems. Therefore, battery parameter limits are only required when the DC power source is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.8.4 and LCO 3.8.5.

ACTIONS

Insert 1 ①

A.1, A.2, and A.3

With one or more cells in one battery ~~or more batteries in one subsystem~~ < ~~[~~2.07~~]~~ V, the battery cell is degraded. Within 2 hours verification of the required battery charger OPERABILITY is made by monitoring the battery terminal voltage (SR 3.8.4.1) and of the overall battery state of charge by monitoring the battery float charge current (SR 3.8.6.1). This assures that there is still sufficient battery capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of one or more cells in one or more batteries < ~~[~~2.07~~]~~ V, and continued operation is permitted for a limited period up to 24 hours. ⑥ ② ②

Since the Required Actions only specify "perform," a failure of SR 3.8.4.1 or SR 3.8.6.1 acceptance criteria does not result in this Required Action not met. However, if one of the SRs is failed the appropriate Condition(s), depending on the cause of the failures, is entered. If SR 3.8.6.1 is failed then there is no assurance that there is still sufficient battery capacity to perform the intended function and the battery must be declared inoperable immediately.

B.1 and B.2

One battery ~~or more batteries in one subsystem~~ with float current > ~~[~~2~~]~~ amps indicates that a partial discharge of the battery capacity has occurred. This may be due to a temporary loss of a battery charger or possibly due to one or more battery cells in a low voltage condition reflecting some loss of capacity. Within 2 hours verification of the required battery charger OPERABILITY is made by monitoring the battery terminal voltage. If the terminal voltage is found to be less than the minimum established float voltage there are two possibilities, the battery charger is inoperable or is ⑥ ②

①

Insert 1

The Note to the ACTIONS clarifies that separate Condition entry is allowed for each battery. This is acceptable since the Required Actions for each Condition provide appropriate compensatory actions for each battery parameter not within limits. Complying with the Required Actions for one inoperable battery may allow for continued operation, and a subsequent inoperable battery is governed by separate Condition entry and application of associated Required Actions.

ACTIONS (continued)

operating in the current limit mode. Condition A addresses charger inoperability. If the charger is operating in the current limit mode after 2 hours that is an indication that the battery has been substantially discharged and likely cannot perform its required design functions. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within ~~[~~12~~]~~ hours (Required Action B.2). The battery must therefore be declared inoperable. ②

If the float voltage is found to be satisfactory but there are one or more battery cells with float voltage less than ~~[~~2.07~~]~~ V, the associated "<u>OR</u>" statement in Condition F is applicable and the battery must be declared inoperable immediately. ② If float voltage is satisfactory and there are no cells less than ~~[~~2.07~~]~~ V there is good assurance that, within ~~[~~12~~]~~ hours, the battery will be restored to its fully charged condition (Required Action B.2) from any discharge that might have occurred due to a temporary loss of the battery charger. ②

~~-----REVIEWER'S NOTE-----~~
~~A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).~~ ⑤
~~----------~~

A discharged battery with float voltage (the charger setpoint) across its terminals indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within ~~[~~12~~]~~ hours, avoiding a premature shutdown with its own attendant risk. ②

If the condition is due to one or more cells in a low voltage condition but still greater than ~~[~~2.07~~]~~ V and float voltage is found to be satisfactory, this is not indication of a substantially discharged battery and ~~[~~12~~]~~ hours is a reasonable time prior to declaring the battery inoperable. ②

BASES

ACTIONS (continued)

Since Required Action B.1 only specifies "perform," a failure of SR 3.8.4.1 acceptance criteria does not result in the Required Action not met. However, if SR 3.8.4.1 is failed, the appropriate Condition(s), depending on the cause of the failure, is entered.

C.1, C.2, and C.3

With one battery ~~or more batteries in one subsystem~~ with one or more cells electrolyte level above the top of the plates, but below the minimum established design limits, the battery still retains sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of electrolyte level not met. Within 31 days the minimum established design limits for electrolyte level must be re-established. ⑥

With electrolyte level below the top of the plates there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential (as well as provisions in Specification 5.5.14~~6~~, Battery Monitoring and Maintenance Program). They are modified by a Note that indicates they are only applicable if electrolyte level is below the top of the plates. Within 8 hours level is required to be restored to above the top of the plates. The Required Action C.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.14~~6~~.b item to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from IEEE Standard 450. They are performed following the restoration of the electrolyte level to above the top of the plates. Based on the results of the manufacturer's recommended testing, the batter~~[~~y~~][ies]~~ may have to be declared inoperable and the affected cell~~[~~s~~]~~ replaced. ③ ① ②

D.1

With one battery ~~or more batteries in one subsystem~~ with pilot cell temperature less than the minimum established design limits, 12 hours is allowed to restore the temperature to within limits. A low electrolyte temperature limits the current and power available. Since the battery is sized with margin, while battery capacity is degraded, sufficient capacity exists to perform the intended function and the affected battery is not required to be considered inoperable solely as a result of the pilot cell temperature not met. ⑥

BASES

ACTIONS (continued)

E.1

With ~~one or more~~ two batteries ~~in redundant subsystems~~ with battery parameters not within limits there is not sufficient assurance that battery capacity has not been affected to the degree that the batteries can still perform their required function, given that redundant batteries are involved. With redundant batteries involved this potential could result in a total loss of function on multiple systems that rely upon the batteries. The longer Completion Times specified for battery parameters on ~~non-redundant batteries~~ one battery not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one ~~subsystem~~ battery within 2 hours. ⑥ ①

F.1

With one or more batteries with any battery parameter outside the allowances of the Required Actions for Condition A, B, C, D, or E, or failure of the battery performance discharge test (SR 3.8.6.6), sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding battery must be declared inoperable. Additionally, discovering one or ~~more~~ both batteries ~~in one subsystem~~ with one or more battery cells float voltage less than ~~[~~2.07~~]~~ V and float current greater than ~~[~~2~~]~~ amps indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately. ① ②

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. 1). ~~[The 7 day Frequency is consistent with IEEE-450 (Ref. 1).~~ ②

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑤ ②

This SR is modified by a Note that states the float current requirement is not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. When this float voltage is not maintained the Required Actions of LCO 3.8.4 ACTION A are being taken, which provide the necessary and appropriate verifications of the battery condition. Furthermore, the float current limit of ~~[~~2~~]~~ amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained. ②

SR 3.8.6.2 and SR 3.8.6.5

allowable

127.2 V for a 60 cell battery

2.12

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum ~~established design~~ limit~~s~~ provided by the battery manufacturer, which corresponds to ~~[130.5] V at the battery terminals~~, or ~~[2.25]~~ Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltages in this range or less, but greater than ~~[~~2.07~~]~~ Vpc, are addressed in Specification 5.5.1~~6~~. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are equal to or greater than the short term absolute minimum voltage of ~~[~~2.07~~]~~ V. ~~[The Frequency for cell voltage verification every 31 days for pilot cell and 92 days for each connected cell is consistent with IEEE-450 (Ref. 1).~~ ① ② ③ ②

4

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑤ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

Electrolyte level is monitored as part of the "Battery Monitoring and Maintenance Program" (ITS 5.5.14). Level is maintained above the top of the plates with Action taken when level is ≤ ¼" above the maximum level indication mark.

SR 3.8.6.3

The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. ~~[The Frequency of 31days is consistent with IEEE-450 (Ref. 1).~~

~~OR~~ ②

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

~~-------------------------------REVIEWER'S NOTE--------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑤
~~---]~~ ②

SR 3.8.6.4

This Surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., ~~[40]~~ 50 °F). ② Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. ~~[The Frequency of 31 days is consistent with IEEE-450 (Ref. 1).~~

~~OR~~ ②

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

~~-------------------------------REVIEWER'S NOTE--------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑤
~~---]~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.6

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

Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.6.6; however, only the modified performance discharge test may be used to satisfy the battery service test requirements of SR 3.8.4.3.

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

It may consist of just two rates; for instance the one minute rate for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance test, both of which envelope the duty cycle of the service test. Since the ampere-hours removed by a one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test must remain above the minimum battery terminal voltage specified in the battery service test for the duration of time equal to that of the service test.

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 1) and IEEE-485 (Ref. 5). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this ~~[~~80~~]~~% limit. ②

~~[The Surveillance Frequency for this test is normally 60 months.~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ②

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑤ ②
~~--]~~

If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's ratings. Degradation is indicated, according to IEEE-450 (Ref. 1), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is ≥ ~~[~~10%~~]~~ below the manufacturer's rating. ② These Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1).

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 2, 3, or 4 ~~or 2~~ is further amplified to allow portions of the ⑥ Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 2, 3, or 4 ~~or 2~~. ② Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

BASES

REFERENCES

1. IEEE-450.
2. FSAR, Chapter ~~[~~8~~]~~.

U

3. FSAR, Chapter ~~[~~6~~]~~.

U

4. FSAR, Chapter ~~[~~15~~]~~.

②

5. IEEE-485-~~[~~1983~~], June 1983~~. ① ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.6 BASES, BATTERY PARAMETERS

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Changes have been made to reflect changes made to other Specifications.

4. These battery design values have been deleted because they are more specific than necessary and are not required to provide sufficient background for this Specification.

5. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

6. Changes have been made to reflect changes made to the Specification.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.6, BATTERY PARAMETERS

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 7

ITS 3.8.7, Inverters - Operating

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

ELECTRICAL POWER SYSTEMS

Add proposed ITS 3.8.7

M01

ELECTRICAL POWER SYSTEMS

3/4.8.3 ~~ONSITE POWER DISTRIBUTION~~

INVERTERS -

OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.7

A02

LCO 3.8.7

3.8.3.1 The following electrical busses shall be energized in the specified manner with both tie breakers open between redundant busses and between St. Lucie Unit 1 and Unit 2.

a. Train A A.C. Emergency Busses consisting of:

1.	4160 volt Emergency Bus	# 2A3
2.	480 volt Emergency Bus	# 2A2
3.	480 volt Emergency Bus	# 2A5
4.	480 volt MCC Emergency Bus	# 2A5
5.	480 volt MCC Emergency Bus	# 2A6
6.	480 volt MCC Emergency Bus	# 2A7
7.	480 volt MCC Emergency Bus	# 2A8
8.	480 volt MCC Emergency Bus	# 2A9

b. Train B A.C. Emergency Busses consisting of:

1.	4160 volt Emergency Bus	# 2B3
2.	480 volt Emergency Bus	# 2B2
3.	480 volt Emergency Bus	# 2B5
4.	480 volt MCC Emergency Bus	# 2B5
5.	480 volt MCC Emergency Bus	# 2B6
6.	480 volt MCC Emergency Bus	# 2B7
7.	480 volt MCC Emergency Bus	# 2B8
8.	480 volt MCC Emergency Bus	# 2B9

See ITS 3.8.9

c. 120 volt A.C. Instrument Bus # 2MA energized from its associated inverter connected to D.C. Bus # 2A*.

d. 120 volt A.C. Instrument Bus # 2MB energized from its associated inverter connected to D.C. Bus # 2B*.

e. 120 volt A.C. Instrument Bus # 2MC energized from its associated inverter connected to D.C. Bus # 2A*.

f. 120 volt A.C. Instrument Bus # 2MD energized from its associated inverter connected to D.C. Bus # 2B*.

See ITS 3.8.9

g. 125 volt D.C. Bus # 2A energized from Battery Bank # 2A.

h. 125 volt D.C. Bus # 2B energized from Battery Bank # 2B.

See ITS 3.8.9

Applicability

APPLICABILITY: MODES 1, 2, 3, and 4.

associated AC instrument

to

LCO 3.8.7 NOTE

* Two inverters may be disconnected from their D.C. Bus for up to 24 hours~~, as necessary, for the purpose of~~ perform~~ing~~ an equalizing charge on their associated battery bank provided (1) their ~~vital~~ busses are energized, and (2) the vital busses associated with the other battery bank are energized from their associated inverters and connected to their associated D.C. Bus.

OPERABLE

from their Class 1E constant voltage source transformer

M02

ELECTRICAL POWER SYSTEMS

ACTION:

See ITS 3.8.9

NOTE

Enter applicable ACTIONS of LCO 3.8.2.1, "D.C. Sources - Operating," for DC trains made inoperable by inoperable AC distribution system.

a. With one of the required trains of A.C. Emergency busses not fully energized, re-energize the train within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one A.C. Instrument Bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus: (1) re-energize the A.C. Instrument Bus within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours and (2) re-energize the A.C. Instrument Bus from its associated inverter connected to its associated D.C. Bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

Add proposed Condition A and Required Action A.1

ACTION A

ACTION B

ACTION B.2 NOTE

A02

c. With one D.C. Bus not energized from its associated Battery Bank, re-energize the D.C. Bus from its associated Battery Bank within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.8.9

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1 4.8.3.1 The specified busses shall be determined energized ~~in the required manner~~ in accordance with the Surveillance Frequency Control Program ~~by~~ verify~~ing correct breaker alignment and indicated voltage on the busses~~.

correct inverter voltage, frequency, and alignment to AC instrument buses.

M03

DISCUSSION OF CHANGES
ITS 3.8.7, INVERTERS - OPERATING

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 **Unit 2 only:** CTS does not have a specific requirement for Train A and Train B inverters to be OPERABLE or Required Actions for inoperable inverters. A new ITS LCO 3.7.8, requires Train A and Train B inverters to be OPERABLE. Functionality of inverters is currently necessary to meet CTS 3.8.3.1 Required Action b. ITS 3.8.7 ACTION A covers the condition of one inoperable Train A or Train B inverter. ITS 3.8.7 ACTION A requires the restoration of the inoperable inverter to OPERABLE status within 24 hours and provides a Note to direct entry into ITS 3.8.9, “Distributions Systems – Operating,” ACTIONS with any 120V instrument bus deenergized. ITS 3.8.7 ACTION B covers the inability of Condition A to be met and requires the plant be in MODE 3 within 6 hours and MODE 4 within 12 hours with a Note stating that LCO 3.0.4.a is not applicable when entering MODE 4. These actions are equivalent to the actions specified in CTS 3.8.3.1 Action b.

These changes are designated as administrative changes and are acceptable because they provide clarity regarding the current requirements associated with the inverters and do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 **Unit 1 only:** CTS does not have a requirement for inverters to be OPERABLE in MODES 1, 2, 3, and 4, Required Actions or Surveillance Requirements. However, PSL administratively maintains the safety related inverters functional to support OPERABILITY of the 120V AC instrument buses. ITS LCO 3.8.7 requires the Train A and Train B inverters to be OPERABLE in MODES 1, 2, 3, and 4. In addition, ITS 3.8.7 provides the necessary Required Actions and Surveillance Requirement. PSL controls periodic Frequencies for Surveillances in accordance with the Surveillance Frequency Control Program per CTS 6.8.4.o. Therefore, SR 3.8.7.1 will be performed at a Frequency in accordance with the Surveillance Frequency Control Program with an initial Frequency of 7 days consistent with the ISTS. This changes the CTS by incorporating the requirements of ITS 3.8.7.

The safety related function of the Train A and Train B inverters is to provide an uninterruptible power supply for the 120 VAC instrument buses. This change is acceptable because the safety analyses assume that the loads supported by the 120V AC instrument buses have an uninterruptible supply of AC electrical power even if the 4.16 kV essential buses are de-energized. This change is designated as more restrictive because it adds new requirements to the CTS.

M02 **Unit 2 only:** Unit 2 CTS 3.8.3.1 Note * provides an allowance for two inverters to be disconnected from their DC source for up to 24 hours for performing an equalizing charge on their associated battery bank if certain provisions are maintained. The provisions require that the vital busses are energized and vital busses associated with the other battery bank are energized from their associated OPERABLE inverters. ITS 3.8.7 Note provides a similar allowance and specifies that the affected 120V instrument busses are energized from their Class 1E constant voltage source transformer. This changes the CTS by specifying that the inverters that are disconnected from their DC source for the performance of an equalizing charge on the associated battery bank shall be energized from their respective Class 1E constant voltage source transformer.

The purpose of Unit 2 CTS 3.8.3.1 is to ensure stable and reliable AC electrical power for the system instrumentation required for a safe reactor shut down. CTS 3.8.3.1 Note * provides an allowance to disconnect the inverters from their DC source to preclude damage to the inverters when the associated battery bank is undergoing an equalizing charge. Requiring the AC instrument bus to be energized from its respective inverter powered from the Class 1E constant voltage source transformer ensures the AC instrument bus continues to be powered from a stable power source to minimize perturbations on the AC instrumentation bus. This change is designated as more restrictive because ITS requires the instrumentation busses associated with inverters disconnected from their DC source during an equalizing charge on the associated battery bank to be energized from a specific source of power.

M03 **Unit 2 only:** CTS 4.8.3.1 does not specifically apply to inverter operability but requires, in part, that specified buses be determined OPERABLE by verifying correct breaker alignment. ITS SR 3.8.7.1 requires the verification of correct inverter voltage, frequency, and alignment to required AC vital buses. This changes the CTS by requiring the specific verification of inverter voltage and frequency.

The purpose of this change is to ensure the instrumentation channels are provided with the proper voltage and frequency from the AC instrument bus when powered by the associated inverter. This change is acceptable because the Surveillance will verify OPERABILITY of the inverters. Proper voltage and frequency is supplied to the instrumentation channels that provide inputs to the vital instrument systems (e.g., Reactor Protective System and Engineered Safety Features Actuation System). This change is designated as more restrictive because the ITS requires verification of the correct voltage and frequency, where the CTS does not provide explicit requirements for the inverter.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

DOC M01 LCO 3.8.7 The ~~required~~ Train A and Train B inverters shall be OPERABLE. ①

---NOTE---

~~[[One/t~~T wo] inverter~~[s]~~ may be disconnected from ~~[its/~~their~~]~~ associated DC bus for ≤ 24 hours to perform an equalizing charge on ~~[its/~~their~~]~~ associated ~~[~~common~~]~~ battery, provided: ② ③

a. The ~~AC vital~~ 120V AC instrument bus(es) ~~[is/~~are~~]~~ energized from ~~[its/~~their~~]~~ ~~[~~Class 1E constant voltage source transformer~~s] [inverter using internal AC source]~~ and

b. All other ~~AC vital~~ 120V AC instrument buses are energized from their associated OPERABLE inverters. ~~]~~ ②

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M01 A. One ~~[required]~~ inverter inoperable.	A.1 ---------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating," with any ~~vital~~ 120V AC instrument bus de-energized. ------------------------------------- Restore inverter to OPERABLE status.	③ ② 24 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ ③

CTS

ACTIONS (continued)

DOC M01

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	--------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. ------------------------------------- Be in MODE 4	12 hours

SURVEILLANCE REQUIREMENTS

DOC M01

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, ~~[~~frequency,~~]~~ and alignment to ~~required AC vital~~ 120V AC instrument buses.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~

① ②

③

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

DOC A02 LCO 3.8.7 The ~~required~~ Train A and Train B inverters shall be OPERABLE. ①

T

---NOTE---

DOC M02

~~[[One/t~~wo] inverter~~[~~s~~]~~ may be disconnected from ~~[its/~~their~~]~~ associated DC bus for ≤ 24 hours to perform an equalizing charge on ~~[its/~~their~~]~~ associated ~~[~~common~~]~~ battery, provided:

120V AC instrument

a. The associated ~~AC vital~~ bus(es) ~~[is/~~are~~]~~ energized from ~~[its/~~their~~]~~ ~~[~~Class 1E constant voltage source transformer~~s] [inverter using internal AC source]~~ and

120V AC instrument

b. All other ~~AC vital~~ buses are energized from their associated OPERABLE inverters. ~~]~~

② ③ ②

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One ~~[required]~~ inverter inoperable.	A.1	---------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating," with any ~~vital~~ bus de-energized. ------------------------------------- Restore inverter to OPERABLE status.	24 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~

DOC A02

120V AC instrument

③ ② ③

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC A02	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. ------------------------------------- Be in MODE 4	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
DOC M03	SR 3.8.7.1	Verify correct inverter voltage, ~~[~~frequency,~~]~~ and alignment to ~~required AC vital~~ 120V AC instrument buses.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ② ③

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.7, INVERTERS - OPERATING

1. The word “required” has been deleted from the LCO and SR 3.8.7.1 since all Train A and Train B inverters are required.

2. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.7 Inverters - Operating

BASES

BACKGROUND

The inverters are the preferred source of power for the 120 V AC ~~vital~~ instrument buses because of the stability and reliability they achieve. The function of each ~~the~~ inverter is to provide AC electrical power to the associated 120 VAC instrument ~~vital~~ bus~~es~~. The inverters are ~~can be~~ powered from ~~an internal AC source/rectifier or from~~ the station batter~~y~~ies. The inverters ~~station battery~~ provide~~s~~ an uninterruptible power source for the instrumentation and controls for the Reactor Protective System (RPS) and the Engineered Safety Feature Actuation System (ESFAS). Specific details on inverters and their operating characteristics are found in the UFSAR, Chapter ~~[~~8~~]~~ (Ref. 1). ① ②

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter ~~[~~6~~]~~ (Ref. 2) and Chapter ~~[~~15~~]~~ (Ref. 3), assume Engineered Safety Feature systems are OPERABLE. The inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the RPS and ESFAS instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems. ② ①

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and is based on meeting the design basis of the unit. This includes maintaining required 120 V AC ~~vital~~ instrument buses OPERABLE during accident conditions in the event of: ①

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

b. A worst case single failure.

Inverters are a part of the electrical power distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The inverters ensure the availability of 120 V AC electrical power for the systems instrumentation required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. ①

BASES

LCO (continued)

Maintaining the required inverters OPERABLE ensures that the redundancy incorporated into the design of the RPS and ESFAS instrumentation and controls is maintained. The four inverters ~~[~~(two per train)~~]~~ ensure an uninterruptible supply of 120 V AC electrical power to the AC instrument ~~vital~~ buses even if the 4.16 kV safety buses are de-energized. ② ①

OPERABLE inverters require the associated instrument ~~vital~~ bus to be powered by the inverter with output voltage and frequency within tolerances, and power input to the inverter from a ~~[~~125 VDC~~]~~ station battery. ~~Alternatively, power supply may be from an internal AC source via rectifier as long as the station battery is available as the uninterruptible power supply~~. ① ② ①

This LCO is modified by a Note that allows ~~[one/~~two~~]~~ inverters to be disconnected from a ~~[~~common~~]~~ battery for ≤ 24 hours, if the instrument ~~vital~~ bus(es) are ~~is~~ powered from a ~~[~~Class 1E constant voltage transformer ~~or inverter using internal AC source]~~ during the period and all other inverters are OPERABLE ~~operable~~. This allows an equalizing charge to be placed on one battery. If the inverter(s) were not disconnected, the resulting voltage condition might damage the inverter(s). These provisions minimize the loss of equipment that would occur in the event of a loss of offsite power. The 24 hour time period for the allowance minimizes the time during which a loss of offsite power could result in the loss of equipment energized from the affected AC instrument ~~vital~~ bus while taking into consideration the time required to perform an equalizing charge on the battery bank. ② ① ④ ①

The intent of this Note is to limit the number of inverters that may be disconnected. Only those inverters associated with the single battery undergoing an equalizing charge may be disconnected. All other inverters must be aligned to their associated batteries, regardless of the number of inverters or unit design.

APPLICABILITY

The inverters are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Inverter requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.8, "Inverters - Shutdown."

BASES

ACTIONS

A.1

Train A or Train B
120 V
instrument

With a ~~required~~ inverter inoperable, its associated AC ~~vital~~ bus becomes ①

unless

inoperable ~~until~~ it is ~~[~~manually~~]~~ re-energized from its ~~[~~Class 1E constant ②
voltage source transformer ~~or inverter using internal AC source]~~. ①

LCO 3.8.9, "Distribution Systems – Operating," addresses this action however, pursuant to LCO 3.0.6, this action would not have to be entered even if the 120 VAC instrument bus were de-energized.

Required Action A.1 is modified by a Note, which states to enter the applicable conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition A is entered with ~~one AC vital~~ bus de-energized. This ensures the ~~vital~~ bus is re-energized within 2 hours. ①

120 VAC instrument
any 120 VAC instrument

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ② The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail.

120 VAC instrument
Class 1E
120 VAC instrument

When the ~~AC vital~~ bus is powered from its constant voltage ~~source~~, it is relying upon interruptible AC electrical power sources (offsite and onsite). ① The uninterruptible inverter source to the ~~AC vital~~ buses is the preferred source for powering instrumentation trip setpoint devices.

transformer

B.1 and B.2

~~-------------------------------REVIEWER'S NOTE -------------------------------~~ ③
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~

~~---~~

Train A or Train B inverter

If the inoperable ~~devices or components~~ cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. ①

BASES

ACTIONS (continued)

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 4). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.

Required Action B.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and ~~AC vital~~ 120 VAC instrument buses energized from the associated inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation of the RPS and ESFAS connected to the ~~AC vital~~ 120 VAC instrument buses. ① ~~[The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.~~ ②

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~---]~~ ②

BASES

REFERENCES

1. U FSAR, Chapter ~~[~~8~~]~~.

2. U FSAR, Chapter ~~[~~6~~]~~.

3. U FSAR, Chapter ~~[~~1 5 ~~4]~~.

② ①

4. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.7 Inverters - Operating

BASES

BACKGROUND

The inverters are the preferred source of power for the 120 V AC instrument ~~vital~~ buses because of the stability and reliability they achieve. The function of each ~~the~~ inverter is to provide AC electrical power to the associated 120 VAC instrument ~~vital~~ bus~~es~~. The inverters are ~~can be~~ powered from ~~an internal AC source/rectifier or from~~ the station batteries~~y~~. The inverters ~~station battery~~ provide~~s~~ an uninterruptible power source for the instrumentation and controls for the Reactor Protective System (RPS) and the Engineered Safety Feature Actuation System (ESFAS). Specific details on inverters and their operating characteristics are found in the UFSAR, Chapter ~~[~~8~~]~~ (Ref. 1). ① ②

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter ~~[~~6~~]~~ (Ref. 2) and Chapter ~~[~~15~~]~~ (Ref. 3), assume Engineered Safety Feature systems are OPERABLE. The inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the RPS and ESFAS instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems. ② ①

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and is based on meeting the design basis of the unit. This includes maintaining required 120 V AC instrument ~~vital~~ buses OPERABLE during accident conditions in the event of: ①

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

b. A worst case single failure.

Inverters are a part of the electrical power distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The inverters ensure the availability of 120 V AC electrical power for the systems instrumentation required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. ①

BASES

LCO (continued)

Maintaining the required inverters OPERABLE ensures that the redundancy incorporated into the design of the RPS and ESFAS instrumentation and controls is maintained. The four inverters ~~[~~(two per train)~~]~~ ensure an uninterruptible supply of 120 V AC electrical power to the AC instrument ~~vital~~ buses even if the 4.16 kV safety buses are de-energized. ② ①

OPERABLE inverters require the associated instrument ~~vital~~ bus to be powered by the inverter with output voltage and frequency within tolerances, and power input to the inverter from a ~~[~~125 VDC~~]~~ station battery. ~~Alternatively, power supply may be from an internal AC source via rectifier as long as the station battery is available as the uninterruptible power supply~~. ① ② ①

This LCO is modified by a Note that allows ~~[one/~~two~~]~~ inverters to be disconnected from a ~~[~~common~~]~~ battery for ≤ 24 hours, if the instrument ~~vital~~ bus(es) are ~~is~~ powered from a ~~[~~Class 1E constant voltage transformer ~~or inverter using internal AC source]~~ during the period and all other inverters are OPERABLE ~~operable~~. This allows an equalizing charge to be placed on one battery. If the inverter(s) were not disconnected, the resulting voltage condition might damage the inverter(s). These provisions minimize the loss of equipment that would occur in the event of a loss of offsite power. The 24 hour time period for the allowance minimizes the time during which a loss of offsite power could result in the loss of equipment energized from the affected AC instrument ~~vital~~ bus while taking into consideration the time required to perform an equalizing charge on the battery bank. ① ② ④ ①

The intent of this Note is to limit the number of inverters that may be disconnected. Only those inverters associated with the single battery undergoing an equalizing charge may be disconnected. All other inverters must be aligned to their associated batteries, regardless of the number of inverters or unit design.

APPLICABILITY

The inverters are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Inverter requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.8, "Inverters - Shutdown."

BASES

ACTIONS

A.1

With a ~~required~~ Train A or Train B inverter inoperable, its associated 120 V AC ~~vital~~ instrument bus becomes inoperable ~~until~~ unless it is ~~[~~manually~~]~~ re-energized from its ~~[~~Class 1E constant voltage source transformer ~~or inverter using internal AC source]~~. LCO 3.8.9, "Distribution Systems – Operating," addresses this action however, pursuant to LCO 3.0.6, this action would not have to be entered even if the 120 VAC instrument bus were de-energized. ① ② ①

Required Action A.1 is modified by a Note, which states to enter the applicable conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition A is entered with ~~one AC vital~~ any 120 VAC instrument bus de-energized. This ensures the ~~vital~~ 120 VAC instrument bus is re-energized within 2 hours. ①

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the ~~AC vital~~ 120 VAC instrument bus is powered from its Class 1E constant voltage ~~source~~ transformer, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the ~~AC vital~~ 120 VAC instrument buses is the preferred source for powering instrumentation trip setpoint devices. ② ①

B.1 and B.2

~~-------------------------------REVIEWER'S NOTE -------------------------------~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~

~~--~~ ③

If the inoperable ~~devices or components~~ Train A or Train B inverter cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. ①

BASES

ACTIONS (continued)

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 4). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.

Required Action B.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and ~~AC vital~~ 120V AC instrument buses energized from the associated inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation of the RPS and ESFAS connected to the ~~AC vital~~ 120 VAC instrument buses. ~~[The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.~~ ①

~~OR~~ ②

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

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~--]~~ ②

BASES

REFERENCES

1. FSAR, Chapter ~~[~~8~~]~~.

U

2. FSAR, Chapter ~~[~~6~~]~~.

U

5

3. FSAR, Chapter ~~[~~1~~4~~5~~]~~.

4. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

② ①

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.7 BASES, INVERTERS - OPERATING

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

4. Corrections have been made consistent with the Writer's Guide for the Improved Technical Specifications, TSTF-GG-05-01.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.7, INVERTERS - OPERATING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 8

ITS 3.8.8, Inverters - Shutdown

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

ELECTRICAL POWER SYSTEMS

Add proposed ITS 3.8.8

M01

ITS

A01

ITS 3.8.8

ELECTRICAL POWER SYSTEMS

~~ONSITE POWER DISTRIBUTION~~

INVERTERS -

SHUTDOWN

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.8

A02

LCO 3.8.8 3.8.3.2 As a minimum, the following electrical busses shall be energized and in the specified manner:

a. One train of A.C. emergency busses consisting of one 4160 volt and two 480 volt A.C. emergency busses.

See ITS 3.8.10

b. Two 120 volt A.C. Instrument Busses energized from their associated inverters connected to their respective D.C. busses.

c. One 125 volt D.C. bus energized from its associated battery bank.

See ITS 3.8.10

Applicability **APPLICABILITY**: MODES 5 and 6~~.~~

,

During movement of irradiated fuel assemblies.

M02

ACTION:

Add proposed ACTIONS NOTE

Add proposed Required Action A.1

L01

ACTION A With any of the above required electrical busses not energized in the required manner, immediately suspend ~~all operations involving CORE ALTERATIONS,~~ operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or boron concentration, or movement of irradiated fuel, initiate corrective action to energize the required electrical busses ~~in the specified manner as soon as possible, and within 8 hours depressurize and vent the RCS through a 3.58 square inch vent~~.

assemblies

L02

See ITS 3.8.10

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1 4.8.3.2 ~~The specified busses shall be determined energized in the required manner~~ in accordance with the Surveillance Frequency Control Program ~~by~~ verify~~ing~~ correct ~~breaker alignment and indicated voltage on the~~ busses.

inverter voltage, frequency, and alignments to required 120V ac instrument

M03

DISCUSSION OF CHANGES
ITS 3.8.8, INVERTERS - SHUTDOWN

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 **Unit 2 only:** CTS does not have a specific requirement for inverters to be OPERABLE or Required Actions for inoperable required inverters. However, CTS 3.8.3.2, “Onsite Power Distribution – Shutdown” requires 120V AC instrument busses to be powered from their associated inverters, requiring functionality of the inverters. A new ITS LCO 3.8.8, specifically requires “required” inverters to be OPERABLE to support the 120V AC electrical distribution subsystems required by LCO 3.8.10 when in MODE 5, MODE 6, and during movement of irradiated fuel assemblies. This changes the CTS by adding specific operability requirements for inverters associated with the 120V AC instrument busses necessary to support LCO 3.8.10 requirements.

These changes are designated as administrative changes as they are a clarification of the intent of CTS 3.8.3.2 and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 **Unit 1 only:** CTS does not have a requirement for inverters to be OPERABLE, Required Actions or Surveillance Requirements. ITS LCO 3.8.8 requires inverters to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies to support the 120V AC electrical distribution subsystem required by ITS LCO 3.8.10, “Distribution Systems - Shutdown.”. In addition, ITS 3.8.8 provides the necessary Required Actions and Surveillance Requirement that support inverter OPERABILITY. PSL controls periodic Frequencies for Surveillances in accordance with the Surveillance Frequency Control Program per CTS 6.8.4.o. Therefore, SR 3.8.8.1 will be performed at a Frequency in accordance with the Surveillance Frequency Control Program with an initial Frequency of 7 days consistent with the ISTS. This changes the CTS by incorporating the requirements of ITS 3.8.8.

The safety related function of required inverters is to provide an uninterruptible power supply for the 120 VAC instrument buses. This change is acceptable because the safety analyses assume that the loads supported by the 120 VAC instrument buses have an uninterruptible supply of AC electrical power. This change is designated as more restrictive because it adds new requirements to the CTS.

M02 **Unit 2 only:** CTS does not have a specific requirement for inverters to be OPERABLE or Applicability requirements. See DOC A02 discussion. ITS LCO 3.8.8 is applicable in MODE 5, MODE 6, and during movement of irradiated fuel assemblies. In addition, a Note modifies the ACTIONS to state that LCO 3.0.3 is not applicable. This changes the CTS by adding an Applicability of "during movement of irradiated fuel assemblies" and adds the Note to the ACTIONS stating that LCO 3.0.3 is not applicable.

This change is acceptable because the proposed requirements are necessary to ensure the inverters are OPERABLE to support equipment required to be OPERABLE during movement of irradiated fuel assemblies. Movement of fuel normally occurs during MODES 5 and 6, however, it can also occur outside of containment in other plant MODES (MODES 1, 2, 3, and 4) or other conditions (i.e., reactor defueled). This Specification is needed to ensure the appropriate distribution system requirements are specified during fuel handling and ensure that appropriate ACTIONS are taken (i.e. stop fuel movement) when the minimum electrical supply is not available. This change adds a clarification Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODES 5 or 6, LCO 3.0.3 is not applicable and would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, or 4, the fuel movement is independent of reactor operations and the inability to suspend movement in accordance with the ITS 3.8.8 Required Actions would not be sufficient reason to require a reactor shutdown. This Note has been added for clarification and is necessary since defaulting to LCO 3.0.3 would require the reactor to be shutdown but would not require suspension of activities with a potential for releasing radioactive materials. This change is designated as more restrictive because the ITS requires the equipment to be OPERABLE during movement of irradiated fuel assemblies both inside and outside of the containment in conditions other than MODES 5 and 6.

M03 **Unit 2 only:** Unit 2 CTS 4.8.3.2 does not specifically apply to inverter operability but requires, in part, that specified 120V AC instrument buses be determined OPERABLE by verifying correct breaker alignment. ITS SR 3.8.8.1 requires the verification of correct inverter voltage, frequency, and alignment to required AC vital buses. This changes the CTS by requiring the specific verification of inverter voltage output and frequency.

The purpose of this requirement is to ensure the required instrumentation channels are provided with the proper voltage and frequency from the AC instrument bus when powered by the associated inverter. This change is acceptable because the Surveillance will verify OPERABILITY of the required inverters with the proper voltage and frequency supplied to the instrumentation channels that provide inputs to the vital instrument systems (e.g., Reactor Protective System and Engineered Safety Features Actuation System). This change is designated as more restrictive because the ITS requires verification of the correct voltage and frequency, where the CTS does not provide explicit requirements for the inverter.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

L01 **Unit 2 only:** *(Category 4 – Relaxation of Required Action)* CTS does not have specific actions for inoperable required inverters. However, CTS 3.8.3.2, “Onsite Power Distribution – Shutdown” requires 120V ac instrument busses to be powered from the associated inverter which infers the CTS 3.8.3.2 actions also apply to the inverters. CTS 3.8.3.2 in part states “With any of the above required electrical busses not energized in the required manner, immediately suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity changes that could result in loss of required SHUTDOWN MARGIN or boron concentration, or movement of irradiated fuel.” For one or more required inverters inoperable, ITS 3.8.8 Action A.1 states “Declare affected required feature(s) inoperable.” This must be performed immediately, or other specific Required Actions must be followed. This changes the CTS by allowing the affected required feature(s) with an inoperable inverter to be declared inoperable instead of suspending the specified activities.

The purpose of ITS Required Action A.1 is to provide an alternative to stopping movement of irradiated fuel assemblies and positive reactivity changes with required inverters inoperable. This change is acceptable because the Required Actions of the required supported features are also acceptable remedial actions in response to degraded conditions. These actions also minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a design basis accident occurring during the repair period. The addition of the allowance provides for declaring affected features with electrical power inverters inoperable instead of immediately suspending movement of irradiated fuel assemblies and stopping positive reactivity changes. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 **Unit 2 only:** *(Category 4 – Relaxation of Required Action)* CTS does not have specific actions for inoperable required inverters. However, CTS 3.8.3.2, “Onsite Power Distribution – Shutdown” requires 120V ac instrument busses to be powered from the associated inverter which infers the CTS 3.8.3.2 actions also apply to the inverters. CTS 3.8.3.2 ACTION states, in part, “With any of the above required electrical busses not energized in the required manner, immediately suspend all operations involving CORE ALTERATIONS. ITS 3.8.8

ACTIONS do not include the requirement to suspend CORE ALTERATIONS. This changes the CTS by removing the Required Action to suspend all operations involving CORE ALTERATIONS.

The purpose of the CTS 3.8.3.2 ACTION is to minimize the possibility of an event that may require the electrical power source to mitigate the consequences of a design basis event. CORE ALTERATIONS is defined in CTS 1.9, in part, as "the movement or manipulation of any fuel, sources, reactivity control components, or other components affecting reactivity, within the reactor vessel with the head removed and fuel in the vessel." CORE ALTERATIONS only occur when the reactor vessel head is removed - it only applies in MODE 6. There is only one accident considered during MODE 6 that involves a Core Alteration - a fuel handling accident. According to UFSAR Section 15.7.4.1.2, a fuel handling accident is initiated by the dropping of an irradiated fuel assembly either in the containment or in the fuel handling building. Suspension of CORE ALTERATIONS, except for suspension of movement of irradiated fuel, will not prevent or impair the mitigation of a fuel handling accident.

This change is acceptable because the possibility of damage to a fuel assembly as a consequence of mishandling components other than an irradiated fuel assembly is minimized by thorough training, detailed procedures and equipment design. The PSL crane design precludes the handling of heavy objects, such as shipping casks, over the spent fuel pool storage racks. Administrative controls prevent the movement of heavy loads over the cask pit whenever the cask pit rack is installed in the cask area of the spent fuel storage pool. In addition, the cask handling crane design meets the regulatory guidance for single-failure-proof cranes in NUREG-0554, “Single-Failure-Proof Cranes for Nuclear Power Plants” and NUREG-0612, “Control of Heavy Loads at Nuclear Power Plants.” Administrative controls that control of movement of light loads or prevent movement of light loads over irradiated fuel assemblies are similar to those used for control of heavy loads, to the extent practicable, as advised in NUREG 0612. Consequently, the possibility of dropping a load other than an irradiated fuel assembly and damaging of fuel assemblies in the spent fuel storage pool is remote. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters - Shutdown

DOC M01 LCO 3.8.8

~~[Inverter(s) shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."]~~

Required ~~[One]~~ inverter~~[s]~~ to support the 120V AC electrical distribution subsystem required by LCO 3.8.10, “Distribution Systems – Shutdown.” shall be OPERABLE.~~]~~ ②

~~-----REVIEWER’S NOTE-----~~
~~This second option above applies for plants having a pre-ITS licensing basis (CTS) for electrical power requirements during shutdown conditions that required only [one] inverter to be OPERABLE. The "[or more]" optional wording in Condition A is also eliminated for this case. The first option above is adopted for plants that have a CTS requiring the same level of DC electrical power subsystem/inverter support as is required for power operating conditions.~~
~~----------~~ ③

DOC M01 APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies. ②

DOC M01 ACTIONS

----------------------------------NOTE----------------------------------
LCO 3.0.3 is not applicable

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ~~[~~or more~~]~~ ~~[~~required~~]~~ inverter~~[s]~~ inoperable.	A.1 Declare affected required feature(s) inoperable. <u>OR</u> A.2.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies. <u>AND</u>	Immediately Immediately ②

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	
	A.2.3 Initiate action to restore required inverters to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
DOC M01 SR 3.8.8.1	Verify correct inverter voltage, ~~[~~frequency,~~]~~ and alignments to required ~~AC vital~~ 120V AC instrument buses.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	① ②

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters - Shutdown

3.8.3.2

DOC A02

LCO 3.8.8 ~~[Inverter(s) shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."]~~

Required

~~[One]~~ inverter~~[s]~~ shall be OPERABLE.~~]~~

to support the 120V AC electrical distribution subsystem required by LCO 3.8.10, "Distribution Systems – Shutdown." ②

~~-----REVIEWER'S NOTE-----~~

~~This second option above applies for plants having a pre-ITS licensing basis (CTS) for electrical power requirements during shutdown conditions that required only [one] inverter to be OPERABLE. The "[or more]" optional wording in Condition A is also eliminated for this case. The first option above is adopted for plants that have a CTS requiring the same level of DC electrical power subsystem/inverter support as is required for power operating conditions.~~

~~----------~~ ③

Applicability

DOC M02

APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies. ②

Action

ACTIONS

DOC M02

-----NOTE-----

LCO 3.0.3 is not applicable

DOC L01

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ~~[~~or more~~]~~ ~~[required]~~ inverter~~[s]~~ inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately
	AND	

②

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND A.2.3 Initiate action to restore required inverters to OPERABLE status.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

4.8.3.2
DOC M03

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage, ~~[~~frequency,~~]~~ and alignments to required ~~AC vital~~ 120V AC instrument buses.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

① ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.8, INVERTERS - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters - Shutdown

BASES

BACKGROUND

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), ① ② assume Engineered Safety Feature systems are OPERABLE. The DC to AC inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the ~~minimum~~ inverter to each required ~~AC vital~~ 120 VAC instrument bus during ① MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that: ⑤

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate power is available to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel. Due to radioactive decay, the inverters are only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~. ②

In general, when the unit is shut down, the Technical Specification requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many DBAs that are analyzed in MODES ~~[~~1, 2, 3, and 4~~]~~ have no specific analyses in MODES ~~[~~5 and 6~~]~~ because the energy contained within the reactor ② pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being

BASES

APPLICABLE SAFETY ANALYSES (continued)

significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

The shutdown Technical Specification requirements are designed to ensure that the unit has the capability to mitigate the consequences of certain postulated accidents. Worst case DBAs which are analyzed for operating MODES are generally viewed not to be a significant concern during shutdown MODES due to the lower energies involved. The Technical Specifications therefore require a lesser complement of electrical equipment to be available during shutdown than is required during operating MODES. More recent work completed on the potential risks associated with shutdown, however, have found significant risk associated with certain shutdown evolutions. As a result, in addition to the requirements established in the Technical Specifications, the industry has adopted NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," as an Industry initiative to manage shutdown tasks and associated electrical support to maintain risk at an acceptable low level. This may require the availability of additional equipment beyond that required by the shutdown Technical Specifications.

The inverters were previously identified as part of the electrical power distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The inverter~~[~~s~~]~~ ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The ~~battery powered~~ inverter~~[~~s~~]~~ provide~~[s]~~ uninterruptible supply of AC electrical power to the ~~AC~~ 120 VAC instrument ~~vital~~ bus~~[~~es~~]~~ ~~even if the 4.16 kV safety buses are de-energized~~. OPERABILITY of the inverter~~[s]~~ requires ~~that the vital bus be powered by the inverter~~ the associated 120 VAC instrument bus to be powered by the inverter with the output voltage and frequency within tolerances, and power input from a 125 VDC station battery. This ensures the availability of sufficient inverter power 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]~~). ② ② ①

APPLICABILITY

The inverter~~[~~s~~]~~ required to be OPERABLE in MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies provide assurance that: ⑤ ②

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel 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, ②

BASES

APPLICABILITY (continued)

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.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, 3 LCO.0.3 would not specify any action. If moving irradiated fuel ④ assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

<u>A.1, A.2.1, A.2.2, and A.2.3</u>

~~[~~If ~~two trains~~ one or more inverters are required by LCO 3.8.10, "Distribution Systems - Shutdown," the remaining OPERABLE inverters may be capable of supporting sufficient required features to allow continuation of ~~[recently]~~ irradiated fuel movement, operations with a potential for draining the reactor vessel, and operations with a potential for positive reactivity additions that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6).~~]~~ ② Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive ~~MTC~~ moderator temperature coefficient must also be ④ evaluated to ensure they do not result in a loss of required SDM. By the allowance of the option to declare required features inoperable with the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend movement of ~~[recently]~~ ② irradiated fuel assemblies, and operations involving positive reactivity additions).

BASES

ACTIONS (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverter~~[s]~~ and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems. ②

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from ~~a~~ ① the associated constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and ~~AC vital~~ buses energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation ①
120 VAC instrument
connected to the ~~AC vital~~ buses. ~~[The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.~~ ① ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~---]~~ ②

REFERENCES

U
1. FSAR, Chapter ~~[~~6~~]~~.
2. FSAR, Chapter ~~[~~15~~]~~. ② ①

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters - Shutdown

BASES

BACKGROUND

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), ① ② assume Engineered Safety Feature systems are OPERABLE. The DC to AC inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the ~~minimum~~ inverter to each required ~~AC vital~~ 120 VAC instrument bus during ① MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that: ⑤

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate power is available to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel. Due to radioactive decay, the inverters are only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~. ②

In general, when the unit is shut down, the Technical Specification requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many DBAs that are analyzed in MODES ~~[~~1, 2, 3, and 4~~]~~ have no specific analyses in MODES ~~[~~5 and 6~~]~~ because the energy contained within the reactor ② pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being

APPLICABLE SAFETY ANALYSES (continued)

significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

The shutdown Technical Specification requirements are designed to ensure that the unit has the capability to mitigate the consequences of certain postulated accidents. Worst case DBAs which are analyzed for operating MODES are generally viewed not to be a significant concern during shutdown MODES due to the lower energies involved. The Technical Specifications therefore require a lesser complement of electrical equipment to be available during shutdown than is required during operating MODES. More recent work completed on the potential risks associated with shutdown, however, have found significant risk associated with certain shutdown evolutions. As a result, in addition to the requirements established in the Technical Specifications, the industry has adopted NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," as an Industry initiative to manage shutdown tasks and associated electrical support to maintain risk at an acceptable low level. This may require the availability of additional equipment beyond that required by the shutdown Technical Specifications.

The inverters were previously identified as part of the electrical power distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The inverter~~[~~s~~]~~ ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The ~~battery powered~~ inverter~~[~~s~~]~~ provide~~[s]~~ uninterruptible supply of AC electrical power to the 120 VAC instrument ~~AC vital~~ bus~~[~~es~~] even if the 4.16 kV safety buses are de-energized~~. OPERABILITY of the inverter~~[s]~~ requires the associated 120 VAC instrument bus to be powered by the inverter with the output voltage and frequency within tolerances, and power input from a 125 VDC station battery. ~~that the vital bus be powered by the inverter~~. This ensures the availability of sufficient inverter power 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]~~). ② ② ① ②

APPLICABILITY

The inverter~~[~~s~~]~~ required to be OPERABLE in MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies provide assurance that: ⑤ ②

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel 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, ②

BASES

APPLICABILITY (continued)

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.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily. ④

<u>A.1, A.2.1, A.2.2, and A.2.3</u>

~~[~~If ~~two trains~~ one or more inverters are required by LCO 3.8.10, "Distribution Systems - Shutdown," the remaining OPERABLE inverters may be capable of supporting sufficient required features to allow continuation of ~~[recently]~~ irradiated fuel movement, operations with a potential for draining the reactor vessel, and operations with a potential for positive reactivity additions that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6).~~]~~ ② Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive ~~MTC~~ moderator temperature coefficient must also be ④ evaluated to ensure they do not result in a loss of required SDM. By the allowance of the option to declare required features inoperable with the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend movement of ~~[recently]~~ ② irradiated fuel assemblies, and operations involving positive reactivity additions).

ACTIONS (continued)

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverter~~[s]~~ and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems. ②

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from ~~a~~ the associated constant voltage source transformer. ①

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and ~~AC vital~~ 120 VAC instrument buses energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the ~~AC vital~~ buses. ~~[The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.~~ ① ① ②

~~OR~~

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

~~REVIEWER'S NOTE~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~]~~ ③ ②

REFERENCES

1. U FSAR, Chapter ~~[~~6~~]~~.
2. U FSAR, Chapter ~~[~~15~~]~~. ② ①

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.8 BASES, INVERTERS - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

4. Changes are made to correct an editorial error.

5. Changes are made to reflect changes made to the Specification.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.8, INVERTERS - SHUTDOWN

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 9

ITS 3.8.9, Distribution Systems - Operating

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

ITS

A01

ITS 3.8.9

ELECTRICAL POWER SYSTEMS

3/4.8.2 ONSITE POWER DISTRIBUTION SYSTEMS

A.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

Train A and Train B AC, DC, and AC instrument bus electrical power subsystems

LA02

L01

LCO 3.8.9 3.8.2.1 ~~The following A.C. electrical busses~~ shall be OPERABLE ~~and energized from sources of power other than the diesel generator sets:~~

~~4160~~	~~volt Emergency Bus~~	~~1A3~~
~~4160~~	~~volt Emergency Bus~~	~~1B3~~
~~480~~	~~volt Emergency Bus~~	~~1A2~~
~~480~~	~~volt Emergency Bus~~	~~1B2~~
~~480~~	~~volt Emergency MCC Busses~~	~~1A5, 1A6, 1A7~~
~~480~~	~~volt Emergency MCC Busses~~	~~1B5, 1B6, 1B7~~
~~120~~	~~volt A.C. Instrument Bus~~	~~1MA~~
~~120~~	~~volt A.C. Instrument Bus~~	~~1MB~~
~~120~~	~~volt A.C. Instrument Bus~~	~~1MC~~
~~120~~	~~volt A.C. Instrument Bus~~	~~1MD~~

LA01

Applicability **APPLICABILITY**: MODES 1, 2, 3 and 4.

ACTION:

ACTION A NOTE

NOTE

4 Sources

Enter applicable ACTIONS of LCO 3.8.~~2.3~~, "D.C. ~~Distribution~~ - Operating," for DC trains made inoperable by inoperable AC distribution system.

one or more AC or one or more AC instrument bus electrical power distribution subsystems

ACTION A ACTION B

ACTION D

With ~~less than the above complement of A.C. busses OPERABLE~~, restore the inoperable bus to OPERABLE status within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Add proposed ACTION E

M01

SURVEILLANCE REQUIREMENTS

LA02

L01

M02

SR 3.8.9.1 4.8.2.1 ~~The specified A.C. busses shall be determined OPERABLE and energized from A.C. sources other than the diesel generators~~ in accordance with the Surveillance Frequency Control Program by verify~~ing indicated power availability~~.

correct breaker alignments and voltage to required AC, and AC instrument bus electrical power distribution subsystems

ELECTRICAL POWER SYSTEMS

SYSTEMS

D.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

LCO 3.8.9

3.8.2.3 ~~As a minimum the following~~ Train A and Train B D.C. electrical ~~sources~~ power distribution subsystems shall be OPERABLE:

a. ~~125-volt D.C. bus No. 1A,~~ 125-volt Battery bank No. 1A and a full capacity charger. LA01

See ITS 3.8.4

b. ~~125-volt D.C. bus No. 1B,~~ 125-volt Battery bank No. 1B and a full capacity charger. LA01

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

See ITS 3.8.4

ACTION:

ACTION C

ACTION D

a. With one ~~of the required~~ battery banks ~~or busses~~ DC electrical power distribution subsystem bus inoperable, restore the inoperable battery bank or bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in ~~HOT~~ COLD SHUTDOWN within the following ~~6~~ 30 hours. ~~LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.~~ M03

b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.3.2.a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

See ITS 3.8.4

Add proposed ACTION E M01

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

4.8.2.3.1 ~~Each D.C. bus train shall be determined OPERABLE and energized~~ in accordance with the Surveillance Frequency Control Program ~~by~~ verify~~ing indicated power availability~~ correct breaker alignments and voltage to required DC electrical power distribution subsystems. LA02 M02

4.8.2.3.2 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

See ITS 3.8.4

ITS A01 ITS 3.8.9

ELECTRICAL POWER SYSTEMS

3/4.8.3 ~~ONSITE POWER~~ DISTRIBUTION SOURCES -

OPERATING

LIMITING CONDITION FOR OPERATION

LCO 3.8.9 3.8.3.1 ~~The following electrical busses shall be energized in the specified manner with both tie breakers open between redundant busses and between St. Lucie Unit 1 and Unit 2.~~ LA02

~~a. Train A A.C. Emergency Busses consisting of:~~

~~1. 4160 volt Emergency Bus # 2A3~~
~~2. 480 volt Emergency Bus # 2A2~~
~~3. 480 volt Emergency Bus # 2A5~~
~~4. 480 volt MCC Emergency Bus # 2A5~~
~~5. 480 volt MCC Emergency Bus # 2A6~~
~~6. 480 volt MCC Emergency Bus # 2A7~~
~~7. 480 volt MCC Emergency Bus # 2A8~~
~~8. 480 volt MCC Emergency Bus # 2A9~~

LA01

~~b. Train B A.C. Emergency Busses consisting of:~~

~~1. 4160 volt Emergency Bus # 2B3~~
~~2. 480 volt Emergency Bus # 2B2~~
~~3. 480 volt Emergency Bus # 2B5~~
~~4. 480 volt MCC Emergency Bus # 2B5~~
~~5. 480 volt MCC Emergency Bus # 2B6~~
~~6. 480 volt MCC Emergency Bus # 2B7~~
~~7. 480 volt MCC Emergency Bus # 2B8~~
~~8. 480 volt MCC Emergency Bus # 2B9~~

~~c. 120 volt A.C. Instrument Bus # 2MA energized from its associated inverter connected to D.C. Bus # 2A~~*.

~~d. 120 volt A.C. Instrument Bus # 2MB energized from its associated inverter connected to D.C. Bus # 2B~~*.

~~e. 120 volt A.C. Instrument Bus # 2MC energized from its associated inverter connected to D.C. Bus # 2A~~*.

L01 LA01

~~f. 120 volt A.C. Instrument Bus # 2MD energized from its associated inverter connected to D.C. Bus # 2B~~*.

~~g. 125 volt D.C. Bus # 2A energized from Battery Bank # 2A.~~

~~h. 125 volt D.C. Bus # 2B energized from Battery Bank # 2B.~~

Applicability **APPLICABILITY**: MODES 1, 2, 3, and 4.

---

* Two inverters may be disconnected from their D.C. Bus for up to 24 hours, as necessary, for the purpose of performing an equalizing charge on their associated battery bank provided (1) their vital busses are energized, and (2) the vital busses associated with the other battery bank are energized from their associated inverters and connected to their associated D.C. Bus.

See ITS 3.8.7

ITS

A01

ITS 3.8.9

ELECTRICAL POWER SYSTEMS

ACTION:

Required Action A.1 NOTE

NOTE

4

Enter applicable ACTIONS of LCO 3.8.~~2.1~~, "D.C. Sources - Operating," for DC trains made inoperable by inoperable AC distribution system.

ACTION A

ACTION D

inoperable

a. With one of the required trains of A.C. Emergency busses ~~not fully energized~~, re-energize the train within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION B

ACTION D

inoperable

b. With one A.C. Instrument Bus ~~either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus:~~ (1) re-energize the A.C. Instrument Bus within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours ~~and~~ (2) re-energize the A.C. Instrument Bus from its associated inverter connected to its associated D.C. Bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.8.7

ACTION C

ACTION D

inoperable

c. With one D.C. Bus ~~not energized from its associated Battery Bank~~, ~~re-energize the D.C. Bus from its associated Battery Bank~~ within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

restore DC electrical power distribution subsystem to OPERABLE

Add proposed ACTION E

M01

SURVEILLANCE REQUIREMENTS

LA02

SR 3.8.9.1 4.8.3.1 ~~The specified busses shall be determined energized in the required manner~~ in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignment and ~~indicated~~ voltage ~~on the busses~~.

to required DC electrical power distribution subsystems

DISCUSSION OF CHANGES
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 Unit 1 CTS 3.8.2.1 Action states that with less than the above complement of AC buses OPERABLE, to restore the inoperable bus to OPERABLE status within 8 hours. Unit 1 CTS 3.8.2.3 Action a states that with one required 125 VDC bus inoperable, to restore the inoperable bus to OPERABLE status within 2 hours. Unit 2 CTS 3.8.3.1 Action a states with one required train of A.C. Emergency busses not fully energized, re-energize the train within 8 hours, Action b states that with one A.C. Instrument Bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus within 2 hours, and Action c states that with one D.C. bus not energized from its associated Battery Bank to re-energize the D.C. Bus from its associated Battery Bank with 2 hours. However, there are no limitations to preclude a loss of function due to numerous concurrently inoperable AC and DC buses. ITS 3.8.9 ACTION E has been added, requiring entry into ITS LCO 3.0.3 if two or more inoperable electrical power distribution subsystems result in a loss of safety function.

The purpose of the CTS Actions is to limit the time the unit can operate under these conditions. Unit 1 CTS 3.8.2.3 Action a specifies the compensatory actions for one inoperable DC bus. With two inoperable DC buses, Unit 1 CTS 3.8.2.3 does not provide any actions and entry into LCO 3.0.3 would be required. Unit 1 CTS 3.8.2.1 Action is applicable to all inoperable AC buses even if there is a loss of safety function. Certain combinations of inoperable AC and DC electrical power distribution subsystems may result in a loss of safety function (e.g., an inoperable Train A AC electrical power distribution subsystem in combination with an inoperable Train B DC electrical power distribution subsystem). Unit 2 CTS 3.8.3.1 specifies the compensatory actions for inoperable A.C. Emergency bus train inoperable, one A.C. Instrument Bus inoperable, or one D.C. bus inoperable but does not provide specific actions for conditions that result in a loss of safety function. ITS 3.8.9 includes ACTION E, which requires immediate entry into LCO 3.0.3 if two or more inoperable electrical power distribution subsystems result in a loss of safety function. ITS 3.8.9 Required Action E.1 preserves the intent of ITS LCO 3.0.3 and reflects an additional restriction on plant operation. This change is designated as more restrictive because an explicit action has been added which requires entry into LCO 3.0.3 with any combination of AC and/or DC buses inoperable that result in a loss of safety function.

M02 **Unit 1 only:** CTS 4.8.2.1 requires, in part, the specified A.C. busses shall be determined OPERABLE by verifying "indicated power availability" and CTS 4.8.2.3.1 states each D.C. bus train shall be determined OPERABLE by verifying "indicated power availability." ITS SR 3.8.9.1 requires the verification of correct breaker alignments and "voltage" to required AC, DC, and 120 VAC instrument bus electrical power distribution subsystems. This changes the CTS by requiring the verification of the correct voltages and breaker alignments to the required AC, DC, and 120 VAC instrument bus electrical power distribution subsystems, whereas the CTS only requires verification of indicated power availability.

The purpose of this Surveillance is to ensure required electrical buses are properly energized to support their required function. This is more appropriately accomplished by verifying the correct breaker alignment and proper voltage is supplied to the required AC, DC, and 120 VAC instrument bus electrical power distribution subsystems. This change is acceptable because the Surveillance will continue to verify OPERABILITY of the required AC, DC and instrument bus electrical power distribution subsystems. Proper voltage from the required subsystems ensures proper voltage is supplied to the required safety features. This change is designated as more restrictive because the ITS requires verification of the correct breaker alignments and voltage, whereas the CTS only requires a verification of indicated power availability.

M03 **Unit 1 only:** CTS 3.8.2.3 Action a requires the unit to be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours when one of the required battery banks or buses is inoperable and cannot be restored to OPERABLE status within 2 hours. There is also an additional statement that LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. ITS 3.8.9 ACTION D requires the unit to be in MODE 3 within 6 hours and MODE 5 within 36 hours. This changes the CTS by requiring the unit to be placed in COLD SHUTDOWN within the following 30 hours instead of HOT SHUTDOWN within the following 6 hours and eliminates the note associated with LCO 3.0.4.a.

The purpose of the CTS Actions is to ensure when an inoperable battery bank or bus cannot be restored to OPERABLE status, that the unit is placed in a MODE in which overall plant risk is minimized. PSL adopted TSTF-422, "Change in Technical Specifications End States (CE NPSD-1186)," Revision 2, with application of site-specific variations and deviations from TSTF-422, on August 30, 2016, in License Amendment 234 (NRC ADAMS Accession No. ML16210A374). The CTS Action was revised in Amendment 234 applying the end state action to one required battery bank or DC bus. However, TSTF-422 and the associated Combustion Engineering Topical Report CE NPSD-1186-A, “Technical Justification for the Risk-Informed Modification to Selected Required Action End States for CEOG Member PWRs,” Revision 00 (NRC ADAMS Accession No. ML110410539), did not include an evaluation of applying the end state to an inoperable DC bus. Therefore, when one DC electrical power distribution subsystem (i.e., required DC bus) is inoperable and cannot be restored within 2 hours, ITS 3.8.9 ACTION D requires the unit to be in MODE 3 (Hot Standby) within 6 hours and MODE 5 (Cold Shutdown) within 36 hours. As a result of the end state change, the Note associated with LCO 3.0.4.a is also unnecessary and deleted. This change is consistent with the ISTS and

TSTF-422. This change does not impact the allowance for an inoperable battery bank (Refer to ITS 3.8.4 for DC sources). The Completion Times to be in MODES 3 and 5 are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. This change is designated as more restrictive because the plant must be brought to a lower MODE than required by CTS when an inoperable DC electrical power distribution subsystem cannot be restored within the required Completion Time.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS 3.8.2.1 and 3.8.2.3 require AC, AC instrument, and DC electrical buses to be OPERABLE and lists the specific busses, including applicable nominal AC bus voltages. Unit 2 CTS 3.8.3.1 requires specified electrical busses to be “energized in the specified manner” and lists the specified AC, DC, and 120 V instrument busses, including applicable nominal bus voltage.

ITS LCO 3.8.9 requires the applicable electrical power distribution subsystems; Train A and Train B AC, DC, and AC instrument buses to be OPERABLE. This changes the CTS by moving the specific names of the buses and the associated nominal bus voltages (i.e., 4160 V, 480 V, 120 V and 125 VDC) from the CTS to the ITS Bases.

The removal of these details related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. ITS 3.8.9 retains the requirement for the required electrical buses to be OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Unit 1 CTS 3.8.2.1 requires the AC electrical busses to be OPERABLE "and energized from sources of power other than the diesel generator sets.” Unit 1 CTS 4.8.2.1 also requires the AC buses to be determined OPERABLE "and energized from AC sources of power other than the diesel generator sets” by verifying indicated power availability. Unit 1 CTS 4.8.2.3.1 requires DC bus trains to be determined OPERABLE "and energized" by verifying indicated power availability. See DOC L01 for discussion of changes related to indicated power availability.

Unit 2 CTS LCO 3.8.3.1 requires the AC and DC electrical busses to "to be energized in the specified manner with both tie breakers open between redundant busses and between St. Lucie Unit 1 and Unit 2." Unit 2 CTS 4.8.3.1 also requires the specified buses to be determined "energized in the required manner" by verifying correct breaker alignment and indicated voltage.

ITS LCO 3.8.9 requires the applicable electrical power distribution subsystems to be OPERABLE and ITS SR 3.8.9.1 requires the verification of correct breaker alignment and voltage to required AC, DC, and AC instrument bus electrical power distribution subsystems. This changes the Unit 1 CTS by moving the procedural detail that the AC buses must be "energized from AC sources of power other than the diesel generator sets" and that the DC busses must be "energized" from the CTS to the ITS Bases. This changes the Unit 2 CTS by moving the procedural detail that the specified busses must be "energized in the specified manner with both tie breakers open between redundant busses and between St. Lucie Unit 1 and Unit 2."

The removal of these details for meeting Technical Specification requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the electrical power distribution subsystems to be OPERABLE and requires the verification of correct breaker alignment and voltage to required AC, DC, and AC instrument bus electrical power distribution subsystems. Also, this change is acceptable because these type of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 1 – Relaxation of LCO Requirements)* Unit 1 CTS 3.8.2.1 specifies that the AC electrical busses shall be OPERABLE "and energized from sources of power other than the diesel generator sets." Unit 2 CTS 3.8.3.1 requires electrical buses to be energized in a specified manner as listed in CTS 3.8.3.1.a through CTS 3.8.3.1.h. ITS LCO 3.8.9 does not include the requirement that an electrical bus be energized from a specific source of power. With regard to power sources, the ITS definition of OPERABLE includes the clarification that "normal or emergency electrical power sources" are acceptable. The CTS definition for OPERABLE simply states "electrical power" as a necessary component for OPERABILITY. This changes the CTS by removing the requirement that electrical busses be energized from specific sources of power.

The purpose of ITS 3.8.9 is to ensure required AC, DC, and AC instrument bus electrical power distribution subsystems are available to support the OPERABILITY of required systems, equipment and components and ensure the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events. ITS 3.8.9 retains the requirement for the required electrical buses to be OPERABLE. The change is acceptable since it is consistent with the definition of OPERABILITY and the ability of the subsystem to support the dependent components and systems is not dependent of the specific source of the power provided the power source is a qualified electrical power source. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems - Operating

3.8.2.1
3.8.2.3
DOC L01 LCO 3.8.9 Train A and Train B AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems shall be OPERABLE. ①

Applicability APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

	CONDITION		REQUIRED ACTION	COMPLETION TIME
ACTION NOTE Action a	A. One or more AC electrical power distribution subsystems inoperable.	A.1	--------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," for DC trains made inoperable by inoperable power distribution subsystems. ------------------------------------- Restore AC electrical power distribution subsystem(s) to OPERABLE status.	8 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ ②
Action b	B. One or more AC ~~vital~~ instrument buses inoperable.	B.1	Restore AC ~~vital~~ instrument bus subsystem(s) to OPERABLE status.	~~2~~ 8 hours ① ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ ②

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
Action c	C. One ~~or more~~ DC electrical power distribution subsystems inoperable.	C.1	Restore DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~	① ②
Action a Action b Action c	D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours	
		AND			
		D.2	Be in MODE 5.	36 hours	
DOC M01	E. Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.	E.1	Enter LCO 3.0.3.	Immediately	

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
SR 4.8.2.1 SR 4.8.2.3.1 DOC L01	SR 3.8.9.1	Verify correct breaker alignments and voltage to ~~[~~required~~]~~ AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ②

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems - Operating

3.8.3.1 LCO 3.8.9 Train A and Train B AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems shall be OPERABLE. ①

Applicability APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

	CONDITION		REQUIRED ACTION	COMPLETION TIME	
ACTION NOTE Action a	A. One or more AC electrical power distribution subsystems inoperable.	A.1	--------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," for DC trains made inoperable by inoperable power distribution subsystems. ------------------------------------- Restore AC electrical power distribution subsystem(s) to OPERABLE status.	8 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~	②
Action b	B. One or more AC ~~vital~~ instrument buses inoperable.	B.1	Restore AC ~~vital~~ instrument bus subsystem(s) to OPERABLE status.	2 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~	① ②

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
Action c	C. One ~~or more~~ DC electrical power distribution subsystems inoperable.	C.1	Restore DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~	① ②
Action a Action b Action c	D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours	
		AND			
		D.2	Be in MODE 5.	36 hours	
DOC M01	E. Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.	E.1	Enter LCO 3.0.3.	Immediately	

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
SR 4.8.3.1	SR 3.8.9.1	Verify correct breaker alignments and voltage to ~~[~~required~~]~~ AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.9 Distribution Systems - Operating

BASES

BACKGROUND

The onsite Class 1E AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems are divided by train into ~~[~~two~~]~~ redundant and independent AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems. ① ② ①

The AC electrical power subsystem for each train consists of a 4.16 kV ~~Engineered Safety Feature (ESF)~~ emergency bus, having at least ~~[~~one separate and independent offsite source of power~~]~~ as well as a dedicated onsite diesel generator (DG) source. Each ~~[~~4.16 kV ~~ESF~~ emergency bus~~]~~ is normally connected to ~~a preferred offsite source~~ the main generator via the unit auxiliary transformer. After a loss of the ~~preferred offsite~~ normal power source to a 4.16 kV ~~ESF~~ emergency bus, a transfer to the ~~alternate~~ preferred offsite source is accomplished by utilizing ~~a time delayed bus undervoltage relay~~ protective relay action. If ~~all~~ offsite sources are unavailable, the onsite emergency DG supplies power to the 4.16 kV ~~ESF~~ emergency bus. Control power for the 4.16 kV breakers is supplied from the Class 1E batteries. Additional description of this system may be found in the Bases for LCO 3.8.1, "AC Sources - Operating," and the Bases for LCO 3.8.4, "DC Sources - Operating." ② ①

The ~~secondary~~ AC electrical power distribution subsystem for each train includes the safety related ~~load centers, motor control centers, and distribution panels~~ buses shown in Table B 3.8.9-1.

The 120 VAC ~~vital~~ instrument bus~~es~~ ~~are~~ electrical power distribution subsystem is arranged in two load groups per train and are normally powered from the inverters. The alternate power supply for the ~~vital~~ instrument buses are Class 1E constant voltage source transformers powered from the same train as the associated inverter, and its use is governed by LCO 3.8.7, "Inverters - Operating." Each constant voltage source transformer is powered from a Class 1E AC bus. ①

The Train A and Train B DC electrical power distribution subsystem consists of two ~~[~~125~~]~~ V bus~~(es) and distribution panel(s)~~ (one for each train) with an interconnecting swing bus. ②

The list of all required DC and ~~vital AC distribution~~ 120 V AC instrument buses ~~[and panels]~~ is presented in Table B 3.8.9-1. ① ②

BASES

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), assume ~~ESF~~ Emergency Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems. ② ①

The OPERABILITY of the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining power distribution systems OPERABLE during accident conditions in the event of: ①

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

b. A worst case single failure.

The distribution systems satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The required power distribution subsystems listed in Table B 3.8.9-1 ensure the availability of AC, DC, and AC ~~vital~~ instrument bus electrical power for the systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. The AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems are required to be OPERABLE. ①

Maintaining the Train A and Train B AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems OPERABLE ensures that the redundancy incorporated into the design of ESF is not defeated. Therefore, a single failure within any system or within the electrical power distribution subsystems will not prevent safe shutdown of the reactor. ①

OPERABLE AC electrical power distribution subsystems require the associated buses~~, load centers, motor control centers, and distribution panels~~ to be energized to their proper voltages. OPERABLE DC electrical power distribution subsystems require the associated buses ~~and distribution panels~~ to be energized to their proper voltage from either the associated battery or charger. OPERABLE ~~vital~~ instrument bus electrical power distribution subsystems require the associated buses to be energized to their proper voltage from the associated ~~[~~inverter via inverted DC voltage~~, inverter using internal AC source,~~ or Class 1E constant voltage transformer~~]~~. ① ②

LCO (continued)

Insert 1 ①

In addition, tie breakers between redundant safety related AC, DC, and AC ~~vital~~ instrument bus power distribution subsystems~~, if they exist,~~ must be open. ① This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, which could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related redundant electrical power distribution subsystems. ~~It does not, however, preclude redundant Class 1E 4.16 kV buses from being powered from the same offsite circuit.~~ ①

APPLICABILITY

The electrical power distribution subsystems are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Electrical power distribution subsystem requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.10, "Distribution Systems - Shutdown."

ACTIONS

<u>A.1</u>

With one or more Train A and B required AC electrical power distribution subsystems ~~buses, load centers, motor control centers, or distribution panels~~ (except AC ~~vital~~ instrument buses), in one train inoperable and a loss of function has not occurred, the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses~~, load centers, motor control centers, and distribution panels~~ must be restored to OPERABLE status within 8 hours ~~[or in accordance with the Risk Informed Completion Time Program]~~. ① ②

①

Insert 1

Based on the number of safety significant electrical loads associated with each bus listed in Table B 3.8.9-1, if one or more of the buses becomes inoperable, entry into the appropriate ACTIONS of LCO 3.8.9 is required. Some buses, such as distribution panels and motor control centers, which help comprise the AC and DC distribution systems, are not listed in Table B 3.8.9-1. The loss of electrical loads associated with these buses may not result in a complete loss of a redundant safety function necessary to shut down the reactor and maintain it in a safe condition. Therefore, should one or more of these buses become inoperable due to a failure not affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., a breaker supplying a single distribution panel fails open), the individual loads on the bus would be declared inoperable, and the appropriate Conditions and Required Actions of the LCOs governing the individual loads would be entered. However, if one or more of these buses is inoperable due to a failure also affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., loss of 4.16 kV essential bus, which results in de-energization of all buses powered from the 4.16 kV essential bus), then although the individual loads are still considered inoperable, the Conditions and Required Actions of the LCO for the individual loads are not required to be entered, since LCO 3.0.6 allows this exception (i.e., the loads are inoperable due to the inoperability of a support system governed by a Technical Specification; the 4.16 kV essential bus).

BASES

ACTIONS (continued)

Condition A worst scenario is one train without AC power (i.e., no offsite power to the train and the associated DG inoperable). In this condition, the unit is more vulnerable to a complete loss of AC power. It is, therefore, imperative that the unit operator's attention be focused on minimizing the potential for loss of power to the remaining train by stabilizing the unit, and on restoring power to the affected train. The 8 hour time limit before requiring a unit shutdown in this condition is acceptable because of:

a. The potential for decreased safety if the unit operator's attention is diverted from the evaluations and actions necessary to restore power to the affected train, to the actions associated with taking the unit to shutdown within this time limit and

b. The potential for an event in conjunction with a single failure of a redundant component in the train with AC power.

Required Action A.1 is modified by a Note that requires the applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," to be entered for DC trains made inoperable by inoperable power distribution subsystems. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. Inoperability of a distribution system can result in loss of charging power to batteries and eventual loss of DC power. This Note ensures that the appropriate attention is given to restoring charging power to batteries, if necessary, after loss of distribution systems.

B.1

With one or more AC ~~vital~~ instrument buses inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC ~~vital~~ instrument buses are capable ① of supporting the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum required ESF functions not being supported. Therefore, the ~~[~~required~~]~~ AC ~~vital~~ instrument bus must be restored to OPERABLE status within ~~2~~ 8 hours by powering the bus from the associated ~~[~~inverter via inverted DC~~, inverter using internal AC source,~~ or Class 1E constant voltage transformer~~]~~. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ① ②

BASES

ACTIONS (continued)

Condition B represents one or more AC ~~vital~~ instrument buses without power; potentially both the DC source and the associated AC source are nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining ~~vital~~ instrument buses, and restoring power to the affected ~~vital~~ instrument bus.

This ~~2~~ 8 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate ~~vital~~ instrument AC power. Taking exception to LCO 3.0.2 for components without adequate ~~vital~~ instrument AC power, which would have the Required Action Completion Times shorter than ~~2~~ 8 hours if declared inoperable, is acceptable because of: ①

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue,

b. The potential for decreased safety by requiring entry into numerous Applicable Conditions and Required Actions for components without adequate ~~vital~~ instrument AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train, and

c. The potential for an event in conjunction with a single failure of a redundant component.

The ~~2~~ 8 hour Completion Time takes into account the importance to safety of restoring the AC ~~vital~~ instrument bus to OPERABLE status, the redundant capability afforded by the other OPERABLE ~~vital~~ instrument buses, and the low probability of a DBA occurring during this period. ①

C.1

With one ~~or more~~ DC ~~buses or distribution panels~~ electrical power distribution subsystem inoperable, and a loss of function has not yet occurred, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the ~~[required]~~ DC ~~buses and~~ electrical power distribution subsystem ① ②

ACTIONS (continued)

~~distribution panels~~ must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger. ① ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ②

Condition C represents one electrical power distribution subsystem ~~or more DC buses or distribution panels~~ without adequate DC power; potentially both with the battery significantly degraded and the ~~associated~~ chargers nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all DC power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining trains and restoring power to the affected train. ①

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components which would be without power. Taking exception to LCO 3.0.2 for components without adequate DC power, which would have Required Action Completion Times shorter than 2 hours, is acceptable because of:

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) while allowing stable operations to continue,

b. The potential for decreased safety by requiring entry into numerous applicable Conditions and Required Actions for components without DC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train, and

c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time for the DC electrical power distribution subsystem ~~buses~~ is consistent with Regulatory Guide 1.93 (Ref. 3). ①

D.1 and D.2

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

E.1

Condition E corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. When more than one inoperable electrical power distribution subsystem results in the loss of a required function, the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. ~~[The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~ ① ②

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ③

REFERENCES

1. U FSAR, Chapter ~~[~~6~~]~~. ②
2. U FSAR, Chapter ~~[~~15~~]~~.
3. Regulatory Guide 1.93, December 1974.

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

TYPE	VOLTAGE	TRAIN A*	TRAIN B*	
AC emergency ~~safety~~ buses	Emergency ~~[~~4160 V~~]~~	Emergency ~~[ESF~~ Bus~~]~~ 1A3 ~~[NB01]~~	Emergency ~~[ESF~~ Bus~~]~~ 1B3 ~~[NB02]~~	①
	Emergency Bus ~~[~~480 V~~]~~	Emergency Bus ~~Load Centers~~ 1A2 ~~[NG01, NG03]~~	Emergency Bus ~~Load Centers~~ 1B2 ~~[NG02, NG04]~~	①
	~~[~~480 V~~]~~	MCC Buses ~~Motor Control Centers~~ 1A5, 1A6, 1A7 ~~[NG01A, NG01I, NG01B, NG03C, NG03I, NG03D]~~	MCC Buses ~~Motor Control Centers~~ 1B5, 1B6, 1B7 ~~[NG02A, NG02I, NG02B, NG04C, NG04I, NG04D]~~	①
	~~[120 V]~~	~~Distribution Panels [NP01, NP03]~~	~~Distribution Panels [NP02, NP04]~~	②
DC buses	~~[~~125 V~~]~~	Bus 1A ~~[NK01]~~ ~~Bus [NK03]~~ ~~Distribution Panels [NK41, NK43, NK51]~~	Bus 1B ~~[NK02]~~ ~~Bus [NK04]~~ ~~Distribution Panels [NK42, NK44, NK52]~~	
AC instrument ~~vital~~ buses	~~[~~120 V~~]~~	Bus 1MA ~~[NN01]~~ Bus 1MC ~~[NN03]~~	Bus 1MB ~~[NN02]~~ Bus 1MD ~~[NN04]~~	①

* Each train of the AC and DC electrical power distribution systems is a subsystem.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.9 Distribution Systems - Operating

BASES

BACKGROUND

The onsite Class 1E AC, DC, and AC ~~vital~~ instrument bus electrical power ① distribution systems are divided by train into ~~[~~two~~]~~ redundant and ② independent AC, DC, and AC ~~vital~~ instrument bus electrical power distribution ① subsystems.

The AC electrical power subsystem for each train consists of a 4.16 kV emergency ~~Engineered Safety Feature (ESF)~~ bus, having at least ~~[~~one separate and independent offsite source of power~~]~~ as well as a dedicated onsite diesel ② generator (DG) source. Each ~~[~~4.16 kV ~~ESF~~ emergency bus~~]~~ is normally connected to ~~a preferred offsite source~~ the main generator via the unit auxiliary transformer. After a loss of the ~~preferred offsite~~ normal power source to a 4.16 kV ~~ESF~~ emergency bus, a transfer to the ~~alternate~~ preferred offsite source is ① accomplished by utilizing ~~a time delayed bus undervoltage relay~~ protective relay action. If ~~all~~ offsite sources are unavailable, the onsite emergency DG supplies power to the 4.16 kV ~~ESF~~ emergency bus. Control power for the 4.16 kV breakers is supplied from the Class 1E batteries. Additional description of this system may be found in the Bases for LCO 3.8.1, "AC Sources - Operating," and the Bases for LCO 3.8.4, "DC Sources - Operating."

The ~~secondary~~ AC electrical power distribution subsystem for each train includes the safety related ~~load centers, motor control centers, and distribution panels~~ buses shown in Table B 3.8.9-1. ①

The 120 VAC ~~vital~~ instrument bus~~es~~ electrical power distribution subsystem is ~~are~~ arranged in two load groups per train and are normally powered from the inverters. The alternate power supply for the ~~vital~~ instrument buses are Class 1E constant voltage source transformers powered from the same train as the associated inverter, and its use is governed by LCO 3.8.7, "Inverters - Operating." Each constant voltage source transformer is powered from a Class 1E AC bus.

The Train A and Train B DC electrical power distribution subsystem consists of two ~~[~~125~~]~~ V ② bus~~(~~es~~) and distribution panel(s)~~ (one for each train) with an interconnecting swing bus. ①

The list of all required DC and ~~vital AC distribution~~ 120 V AC instrument buses ~~[and panels]~~ is presented in Table B 3.8.9-1. ②

BASES

APPLICABLE SAFETY ANALYSES

U instrument ② ①

Emergency Safety Feature (ESF)

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), assume ~~ESF~~ systems are OPERABLE. The AC, DC, and AC ~~vital~~ bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

instrument ①

The OPERABILITY of the AC, DC, and AC ~~vital~~ bus electrical power distribution systems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining power distribution systems OPERABLE during accident conditions in the event of:

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

b. A worst case single failure.

The distribution systems satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

instrument instrument ①

The required power distribution subsystems listed in Table B 3.8.9-1 ensure the availability of AC, DC, and AC ~~vital~~ bus electrical power for the systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. The AC, DC, and AC ~~vital~~ bus electrical power distribution subsystems are required to be OPERABLE.

instrument ①

Maintaining the Train A and Train B AC, DC, and AC ~~vital~~ bus electrical power distribution subsystems OPERABLE ensures that the redundancy incorporated into the design of ESF is not defeated. Therefore, a single failure within any system or within the electrical power distribution subsystems will not prevent safe shutdown of the reactor.

① ② instrument

OPERABLE AC electrical power distribution subsystems require the associated buses~~, load centers, motor control centers, and distribution panels~~ to be energized to their proper voltages. OPERABLE DC electrical power distribution subsystems require the associated buses~~ and distribution panels~~ to be energized to their proper voltage from either the associated battery or charger. OPERABLE ~~vital~~ bus electrical power distribution subsystems require the associated buses to be energized to their proper voltage from the associated ~~[~~inverter via inverted DC voltage~~, inverter using internal AC source,~~ or Class 1E constant voltage transformer~~]~~.

BASES

LCO (continued)

Insert 1 ①

instrument

In addition, tie breakers between redundant safety related AC, DC, and AC ~~vital~~ bus power distribution subsystems~~, if they exist,~~ must be open. This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, which could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related redundant electrical power distribution subsystems. ~~It does not, however, preclude redundant Class 1E 4.16 kV buses from being powered from the same offsite circuit.~~ ① ①

APPLICABILITY

The electrical power distribution subsystems are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Electrical power distribution subsystem requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.10, "Distribution Systems - Shutdown."

ACTIONS

A.1

electrical power distribution subsystems

instrument

With one or more Train A and B required AC ~~buses, load centers, motor control centers, or distribution panels~~ (except AC ~~vital~~ buses), in one train inoperable and a loss of function has not occurred, the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses~~, load centers, motor control centers, and distribution panels~~ must be restored to OPERABLE status within 8 hours ~~[or in accordance with the Risk Informed Completion Time Program]~~. ① ②

①

Insert 1

Based on the number of safety significant electrical loads associated with each bus listed in Table B 3.8.9-1, if one or more of the buses becomes inoperable, entry into the appropriate ACTIONS of LCO 3.8.9 is required. Some buses, such as distribution panels and motor control centers, which help comprise the AC and DC distribution systems, are not listed in Table B 3.8.9-1. The loss of electrical loads associated with these buses may not result in a complete loss of a redundant safety function necessary to shut down the reactor and maintain it in a safe condition. Therefore, should one or more of these buses become inoperable due to a failure not affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., a breaker supplying a single distribution panel fails open), the individual loads on the bus would be declared inoperable, and the appropriate Conditions and Required Actions of the LCOs governing the individual loads would be entered. However, if one or more of these buses is inoperable due to a failure also affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., loss of 4.16 kV essential bus, which results in de-energization of all buses powered from the 4.16 kV essential bus), then although the individual loads are still considered inoperable, the Conditions and Required Actions of the LCO for the individual loads are not required to be entered, since LCO 3.0.6 allows this exception (i.e., the loads are inoperable due to the inoperability of a support system governed by a Technical Specification; the 4.16 kV essential bus).

BASES

ACTIONS (continued)

Condition A worst scenario is one train without AC power (i.e., no offsite power to the train and the associated DG inoperable). In this condition, the unit is more vulnerable to a complete loss of AC power. It is, therefore, imperative that the unit operator's attention be focused on minimizing the potential for loss of power to the remaining train by stabilizing the unit, and on restoring power to the affected train. The 8 hour time limit before requiring a unit shutdown in this condition is acceptable because of:

a. The potential for decreased safety if the unit operator's attention is diverted from the evaluations and actions necessary to restore power to the affected train, to the actions associated with taking the unit to shutdown within this time limit and

b. The potential for an event in conjunction with a single failure of a redundant component in the train with AC power.

Required Action A.1 is modified by a Note that requires the applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources - Operating," to be entered for DC trains made inoperable by inoperable power distribution subsystems. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. Inoperability of a distribution system can result in loss of charging power to batteries and eventual loss of DC power. This Note ensures that the appropriate attention is given to restoring charging power to batteries, if necessary, after loss of distribution systems.

B.1

With one or more AC ~~vital~~ instrument buses inoperable, and a loss of function has
not yet occurred, the remaining OPERABLE AC ~~vital~~ instrument buses are capable ①
of supporting the minimum safety functions necessary to shut down the
unit and maintain it in the safe shutdown condition. Overall reliability is
reduced, however, since an additional single failure could result in the
minimum required ESF functions not being supported. Therefore, the
~~[~~required~~]~~ AC ~~vital~~ instrument bus must be restored to OPERABLE status within ①
2 hours by powering the bus from the associated ~~[~~inverter via inverted
DC~~, inverter using internal AC source,~~ or Class 1E constant voltage ②
transformer~~]~~. ~~[Alternatively, a Completion Time can be determined in
accordance with the Risk Informed Completion Time Program.]~~

BASES

ACTIONS (continued)

instrument

Condition B represents one or more AC ~~vital~~ buses without power; potentially both the DC source and the associated AC source are nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, instrument minimizing the potential for loss of power to the remaining ~~vital~~ buses, and restoring power to the affected ~~vital~~ bus. ①

instrument

instrument

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate ~~vital~~ AC power. Taking exception to LCO 3.0.2 for components without adequate ~~vital~~ AC power, which would have the Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue,

b. The potential for decreased safety by requiring entry into numerous Applicable Conditions and Required Actions for components without instrument adequate ~~vital~~ AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train, and

c. The potential for an event in conjunction with a single failure of a redundant component. ①

The 2 hour Completion Time takes into account the importance to safety instrument of restoring the AC ~~vital~~ bus to OPERABLE status, the redundant capability afforded by the other OPERABLE ~~vital~~ buses, and the low probability of a DBA occurring during this period.

C.1

electrical power distribution subsystem

With one ~~or more~~ DC ~~buses or distribution panels~~ inoperable, and a loss of function has not yet occurred, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the ~~[required]~~ DC ~~buses and~~ ① ②

electrical power distribution subsystem

ACTIONS (continued)

~~distribution panels~~ must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger. ① ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ ②

electrical power distribution subsystem

s

Condition C represents one or more DC ~~buses or distribution panels~~ ① without adequate DC power; potentially both with the battery significantly degraded and the ~~associated~~ charger nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all DC power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining trains and restoring power to the affected train.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components which would be without power. Taking exception to LCO 3.0.2 for components without adequate DC power, which would have Required Action Completion Times shorter than 2 hours, is acceptable because of:

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) while allowing stable operations to continue,

b. The potential for decreased safety by requiring entry into numerous applicable Conditions and Required Actions for components without DC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train, and

c. The potential for an event in conjunction with a single failure of a redundant component.

the electrical power distribution subsystem

The 2 hour Completion Time for DC ~~buses~~ is consistent with Regulatory Guide 1.93 (Ref. 3). ①

D.1 and D.2

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

E.1

Condition E corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. When more than one inoperable electrical power distribution subsystem results in the loss of a required function, the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. ~~[The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~ ① ②

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ③
~~--]~~ ②

REFERENCES

1. U FSAR, Chapter ~~[~~6~~]~~.
2. U FSAR, Chapter ~~[~~15~~]~~.
3. Regulatory Guide 1.93, December 1974.

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

TYPE	VOLTAGE	TRAIN A*	TRAIN B*	
AC ~~safety~~ emergency buses	~~[~~4160 V~~]~~	~~[ESF~~ Emergency Bus~~]~~ ~~[NB01]~~ 2A3	~~[ESF~~ Emergency Bus~~]~~ ~~[NB02]~~ 2B3	①
	~~[~~480 V~~]~~	Emergency Bus ~~Load Centers~~ ~~[NG01, NG03]~~ 2A2, 2A5	Emergency Bus ~~Load Centers~~ ~~[NG02, NG04]~~ 2B2, 2B5	①
	~~[~~480 V~~]~~	MCC Buses ~~Motor Control Centers~~ ~~[NG01A, NG01I, NG01B, NG03C, NG03I, NG03D]~~ 2A5, 2A6, 2A7, 2A8, 2A9	MCC Buses ~~Motor Control Centers~~ ~~[NG02A, NG02I, NG02B, NG04C, NG04I, NG04D]~~ 2B5, 2B6, 2B7, 2B8, 2B9	①
	~~[120 V]~~	~~Distribution Panels [NP01, NP03]~~	~~Distribution Panels [NP02, NP04]~~	②
DC buses	~~[~~125 V~~]~~	Bus ~~[NK01]~~ 2A ~~Bus [NK03]~~ ~~Distribution Panels [NK41, NK43, NK51]~~	Bus ~~[NK02]~~ 2B ~~Bus [NK04]~~ ~~Distribution Panels [NK42, NK44, NK52]~~	
AC ~~vital~~ instrument buses	~~[~~120 V~~]~~	Bus ~~[NN01]~~ 2MA Bus ~~[NN03]~~ 2MC	Bus ~~[NN02]~~ 2MB Bus ~~[NN04]~~ 2MD	①

* Each train of the AC and DC electrical power distribution systems is a subsystem.

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.9 BASES, DISTRIBUTION SYSTEMS - OPERATING

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 10

ITS 3.8.10, Distribution Systems - Shutdown

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

ELECTRICAL POWER SYSTEMS

A.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

The necessary portion of

and AC instrument bus power distribution subsystems

to support equipment required to be OPERABLE.

M01

LA02

L01

LCO 3.8.10 3.8.2.2 ~~As a minimum, the following~~ A~~.~~C~~.~~ electrical ~~busses~~ shall be OPERABLE ~~and energized from sources of power other than a diesel generator set but aligned to an OPERABLE diesel generator set:~~

~~1 - 4160 volt Emergency Bus~~

~~1 - 480 volt Emergency Bus~~

~~3 - 480 volt Emergency MCC Busses~~

~~2 - 120 volt A.C. Instrument Busses~~

LA01

,

Applicability **APPLICABILITY:** MODES 5 and 6

During movement of irradiated fuel assemblies.

M02

ACTION:

Add proposed ACTIONS NOTE

With less than the above complement of A.C. busses OPERABLE ~~and energized, establish CONTAINMENT INTEGRITY within 8 hours~~.

Add proposed Required Actions A.2.1, A.2.2, A.2.3 and A.2.4

Add proposed Required Action A.1

LA02

M04 L02

M01

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1 4.8.2.2 ~~The specified A.C. busses shall be determined OPERABLE and energized from A.C. sources other than the diesel generators~~ in accordance with the Surveillance Frequency Control Program ~~by~~ verify~~ing indicated power availability~~.

correct breaker alignments and voltage to required AC, DC, and AC instrument bus electrical distribution subsystems

LA02

L01

M03

A01

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

The necessary portion of

power distribution subsystems

See ITS 3.8.5

M01

LCO 3.8.10 3.8.2.4 ~~As a minimum, the following~~ D~~.~~C~~.~~ electrical equipment ~~and bus~~ shall be ~~energized and~~ OPERABLE:

LA02

LA01

~~1 - 125-volt D.C. bus, and~~

1 - 125-volt battery bank and charger supplying the above D.C. bus.

See ITS 3.8.5

,

Applicability **APPLICABILITY**: MODES 5 and 6~~.~~

During movement of irradiated fuel assemblies.

ACTION:

Add proposed ACTIONS NOTE

See ITS 3.8.5

M02

With less than the above complement of D~~.~~C~~.~~ equipment ~~and~~ bus OPERABLE, ~~establish CONTAINMENT INTEGRITY within 8 hours~~.

Add proposed Required Actions A.2.1, A.2.2, A.2.3 and A.2.4

M04 L02

Add proposed Required Action A.1

M01

SURVEILLANCE REQUIREMENTS

LA02

SR 3.8.10.1 4.8.2.4.1 ~~The above required 125-volt D.C. bus shall be determined OPERABLE and energized~~ in accordance with the Surveillance Frequency Control Program ~~by~~ verifying ~~ing indicated power availability~~.

correct breaker alignments and voltage to required AC, DC, and AC instrument bus electrical distribution subsystems

M03

4.8.2.4.2 The above required 125-volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2.

See ITS 3.8.6

ELECTRICAL POWER SYSTEMS

ONSITE POWER DISTRIBUTION

SHUTDOWN

LIMITING CONDITION FOR OPERATION

The necessary portion of AC, DC, and AC instrument bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

M01

L01

LCO 3.8.10 3.8.3.2 ~~As a minimum, the following electrical busses shall be energized and in the specified manner:~~

LA02

~~a. One train of A.C. emergency busses consisting of one 4160 volt and two 480 volt A.C. emergency busses.~~

LA01

~~b. Two 120 volt A.C. Instrument Busses energized from their associated inverters connected to their respective D.C. busses.~~

L01

~~c. One 125 volt D.C. bus energized from its associated battery bank.~~

L01

Applicability **APPLICABILITY**: MODES 5 and 6~~.~~ ,

During movement of irradiated fuel assemblies.

M02

ACTION:

ACTION A

Add proposed ACTIONS NOTE

Add proposed Required Action A.1

inoperable

M01

L01

L03

With any of the above ~~required electrical busses not energized in the required manner,~~ immediately suspend ~~all operations involving CORE ALTERATIONS,~~

ACTION A.2.2 operations involving positive reactivity additions that could result in loss of required

ACTION A.2.1 SHUTDOWN MARGIN or boron concentration, or movement of irradiated fuel, initiate

ACTION A.2.3 ~~corrective~~ action to ~~energize the required electrical busses in the specified manner as soon as possible, and within 8 hours depressurize and vent the RCS through a 3.58 square inch vent.~~

restore required AC, DC, and AC instrument bus electrical power distribution subsystems to OPERABLE status.

L04

Add proposed Required Action A.2.4

M04

SURVEILLANCE REQUIREMENTS

L01

SR 3.8.10.1 4.8.3.2 ~~The specified busses shall be determined energized in the required manner~~ in accordance with the Surveillance Frequency Control Program ~~by~~ verify~~ing~~ correct breaker alignment and ~~indicated~~ voltage ~~on the busses~~.

to required AC, DC, and AC instrument bus electrical distribution subsystems

LA02

~~DELETED~~

~~DELETED~~

~~DELETED~~

DISCUSSION OF CHANGES
ITS 3.8.10, DISTRIBUTION SYSTEMS - SHUTDOWN

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 Unit 1 CTS 3.8.2.2 lists the minimum AC and AC instrument buses required to be OPERABLE. Unit 1 CTS 3.8.2.4 requires one 125 VDC bus to be OPERABLE. Unit 2 CTS 3.8.3.2 lists the minimum AC, DC, and AC instrument buses required to be OPERABLE and energized in the manner specified therein.

ITS LCO 3.8.10 requires the necessary portion of AC, DC, and AC instrument bus electrical power subsystems must be OPERABLE to support equipment required to be OPERABLE. In addition, an optional Required Action (ITS 3.8.10 Required Action A.1) has been added which allows the associated supported required feature(s) to be declared inoperable. This changes CTS by adding a requirement that the applicable portions of the AC, DC, and AC instrument bus electrical power distribution subsystems must be OPERABLE when required to support equipment required to be OPERABLE by the Technical Specifications. This could require more buses to be OPERABLE than is currently required based on plant conditions. In addition, an action has been added to allow an option to the existing actions to compensate for the additional required electrical buses.

The purpose of Unit 1 CTS 3.8.2.2 and 3.8.2.4 and Unit 2 CTS 3.8.3.2 is to ensure that the minimum necessary A.C. and D.C. distribution systems are OPERABLE to support shutdown and refueling for extended periods with sufficient instrumentation and controls available for monitoring and maintaining plant status. This change adds a requirement that the necessary portions of AC, DC, and AC instrument bus electrical power distribution subsystems must be OPERABLE when required to support the equipment required to be OPERABLE by the Technical Specifications. This added restriction conservatively assures the needed electrical power distribution buses are OPERABLE, even if it results in more electrical power distribution systems being required. Since the ITS 3.8.10 electrical power distribution subsystem OPERABILITY requirements require the necessary portions of the distribution subsystems to be OPERABLE to support equipment required to be OPERABLE, if a portion of the electrical power distribution subsystem cannot supply any required equipment, that electrical power distribution subsystem is inoperable. In this event it may not be necessary to suspend irradiated fuel handling and positive reactivity additions. Conservative actions can be assured if the required equipment without the necessary power is declared inoperable, and the associated ACTIONS of the individual equipment is taken (ITS 3.8.10 Required Action A.1). Therefore, along with the conservative additional requirements placed on the electrical power distribution subsystems, Required Action A.1, requires the associated supported equipment to be declared inoperable. These changes are acceptable since the additions represent restrictions consistent with implicit assumptions for operation in shutdown conditions (required equipment receiving the necessary required power), and these restrictions are not currently imposed by the Technical Specifications. This change is designated as more restrictive because it adds a new requirement to the CTS.

M02 Unit 1 CTS 3.8.2.2 and CTS 3.8.2.4 and Unit 2 CTS 3.8.2.3 are applicable in MODES 5 and 6. ITS 3.8.10 is applicable in MODE 5 and 6 and during movement of irradiated fuel assemblies. In addition, a Note has been added to the ACTIONS which states that LCO 3.0.3 is not applicable. This changes the CTS by adding the Applicability of “during movement of irradiated fuel assemblies” and adds an ACTIONS Note stating that LCO 3.0.3 is not applicable.

The purpose of CTS Applicability is to ensure that sufficient electrical power subsystems are OPERABLE to support equipment required to mitigate the consequences of an analyzed event during shutdown modes. This change is acceptable because the proposed requirements are necessary to ensure the electrical power subsystems are OPERABLE to support equipment required to OPERABLE during movement of irradiated fuel assemblies. Movement of fuel normally occurs during MODES 5 and 6, however, it can also occur outside of containment in other plant MODES (MODES 1, 2, 3, and 4) or other conditions (i.e., reactor defueled). This Specification is needed to ensure the appropriate distribution system requirements are specified during fuel handling and ensure the appropriate actions are taken (i.e., stop fuel movement) when the minimum electrical supply is not available (See Unit 1 DOC L02 and Unit 2 DOCS L03 and L04 for additional changes to the Required Actions). This change adds a clarification Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODES 5 or 6, LCO 3.0.3 is not applicable and would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, or 4, the fuel movement is independent of reactor operations and the inability to suspend movement in accordance with the ITS 3.8.10 Required Actions would not be sufficient reason to require a reactor shutdown. The Note has been added for clarification and is necessary since defaulting to LCO 3.0.3 would require the reactor to be shutdown but would not require suspension of the activities with a potential for releasing radioactive materials. This change is designated as more restrictive because the ITS requires the equipment to be OPERABLE during movement of irradiated fuel assemblies both inside and outside of the containment in conditions other than MODES 5 and 6.

M03 **Unit 1 only:** CTS 4.8.2.2 requires, in part, the specified A.C. busses shall be determined OPERABLE by verifying "indicated power availability" and CTS 4.8.2.4.1 states each D.C. bus train shall be determined OPERABLE by verifying "indicated power availability." ITS SR 3.8.10.1 requires the verification of correct breaker alignments and "voltage" to required AC, DC, and 120 VAC instrument bus electrical power distribution subsystems. This changes the CTS by requiring the verification of the correct voltages and breaker alignments to the required AC, DC, and 120 VAC instrument bus electrical power distribution subsystems, whereas the CTS only requires verification of indicated power availability.

The purpose of this Surveillance is to ensure required electrical buses are properly energized to support their required function. This is more appropriately accomplished by verifying the correct breaker alignment and proper voltage is supplied to the required AC, DC, and 120 VAC instrument bus electrical power distribution subsystems. This change is acceptable because the Surveillance will continue to verify OPERABILITY of the required AC, DC and instrument bus electrical power distribution subsystems. Proper voltage from the required subsystems ensures proper voltage is supplied to the required safety features. This change is designated as more restrictive because the ITS requires verification of the correct breaker alignments and voltage, whereas the CTS only requires a verification of indicated power availability.

M04 With less than the minimum specified AC and DC busses energized, Unit 2 CTS 3.8.3.2 action requires, in part, the immediate suspension of operations involving positive reactivity additions that could result in loss of required SDM or boron concentration or movement of irradiated fuel. Unit 1 CTS 3.8.2.2 and 3.8.2.4 require establishing CONTAINMENT INTEGRITY within 8 hours. ITS 3.8.10 includes an additional required action (Required Action A.2.4) to "declare associated required shutdown cooling subsystem(s) inoperable and not in operation." This changes the CTS by adding a requirement to declare the required shutdown cooling subsystem(s) (SDCs) inoperable and not in operation that is not currently specifically imposed by the Technical Specification.

This change is necessary because the CTS actions do not adequately address the concern relating to coolant circulation and heat removal. Pursuant to CTS 3.0.6 (ITS LCO 3.0.6), the SDC actions would not be entered unless a loss of safety function was determined to exist. Therefore, Required Action A.2.4 is added to immediately take appropriate SDC actions. This change is designated as more restrictive because it adds a new requirement to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS 3.8.2.2 and 3.8.2.4 require AC AC instrument, and DC electrical buses to be OPERABLE and lists the specific busses, including applicable nominal AC bus voltages. Unit 2 CTS 3.8.3.2 requires electrical busses to be "energized in the specified manner" and lists the specified AC, DC, and 120 V instrument busses, including applicable nominal bus voltage.

ITS LCO 3.8.10 requires the necessary portion of AC, DC, and AC instrument bus electrical power subsystems must be OPERABLE to support equipment required to be OPERABLE. This changes the CTS by moving the specific names of the buses and the associated nominal bus voltages (i.e., 4160 V, 480 V, 120 V and 125 VDC) from the CTS to the ITS Bases.

The removal of these details related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. ITS 3.8.10 retains the requirement for the required electrical buses to be OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Unit 1 CTS 3.8.2.2 requires specific AC electrical busses to be OPERABLE "and energized from sources of power other than a diesel generator set but aligned to an OPERABLE diesel generator set." Unit 1 CTS 4.8.2.2 also requires the specified AC buses to be determined OPERABLE "and energized from AC sources of power other than the diesel generators" by verifying indicated power availability. Unit 1 CTS 3.8.2.4 requires the DC bus to be "energized" and OPERABLE. Unit 1 CTS 4.8.2.4.1 requires DC busses to be determined OPERABLE and "energized" by verifying indicated power availability.

Unit 2 CTS LCO 3.8.3.2 requires AC and DC electrical busses to "to be energized in the specified manner." Unit 2 CTS 4.8.3.2 requires the specified buses to be determined "energized in the required manner" by verifying correct breaker alignment and indicated voltage.

ITS LCO 3.8.10 requires the necessary portions of the electrical power distribution subsystems to be OPERABLE to support equipment required to be OPERABLE and ITS SR 3.8.10.1 requires the verification of correct breaker alignments and voltage to required AC, DC, and AC instrument bus electrical power distribution subsystems.

This changes the Unit 1 and Unit 2 CTS by moving the procedural detail that the AC buses and DC busses must be "energized" from the CTS to the ITS Bases. See DOC L01 for discussion of additional changes to the respective CTS LCO and Surveillance Requirement.

The removal of these details for meeting Technical Specification requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement for the electrical power distribution subsystems to be OPERABLE and requires the verification of correct breaker alignments and voltage to required AC, DC, and AC instrument bus electrical power distribution subsystems. Also, this change is acceptable because these type of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 1 – Relaxation of LCO Requirements)* Unit 1 CTS 3.8.2.2 specifies that the AC electrical busses shall be OPERABLE “and energized from sources of power other than the diesel generator sets but aligned to an OPERABLE diesel generator set.” Unit 2 CTS 3.8.3.2 requires that specified electrical busses be energized “and in the specified manner,” as listed in CTS 3.8.3.2.a through CTS 3.8.3.2.c. ITS LCO 3.8.10 does not include the requirement that the busses be energized by any specific method. ITS defines OPERABLE to include the clarification that “normal or emergency electrical power sources” are acceptable. The CTS definition for OPERABLE simply states “electrical power” as a necessary component for OPERABILITY. This changes the CTS by removing the requirement that electrical busses be energized in any specific manner or from a specific source of power.

The purpose of ITS 3.8.10 is to ensure the necessary AC, DC, and AC instrument bus electrical power distribution subsystems are available to support the OPERABILITY of required systems, equipment and components and ensure the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown. ITS 3.8.10 retains the requirement for the required electrical buses to be OPERABLE. The change is acceptable since it is consistent with the definition of OPERABILITY and the ability of the subsystem to support the dependent components and systems is independent of the specific source of the power provided the power source is a qualified electrical power source. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than applied in the CTS.

L02 **Unit 1 only:** *(Category 4 – Relaxation of Required Action)* With less than the minimum complement of electrical busses OPERABLE and energized, CTS 3.8.2.2 and 3.8.2.4 require the establishment of containment integrity within 8 hours. ITS 3.8.10 ACTION A requires suspending movement of irradiated fuel assemblies, suspension of operations involving positive reactivity additions that could result in the loss of required SDM or boron concentration, the initiation of actions to restore required AC, DC, and AC instrument bus electrical power distribution subsystems to OPERABLE status, and the declaration of the associated required shutdown cooling subsystems(s) inoperable and not in operation. This changes the CTS by replacing the existing Required Action to restore containment integrity with Actions that will prevent a fuel handling accident from occurring, ensure the reactor remains subcritical, and ensure decay heat removal is reestablished.

The purpose of the CTS 3.8.2.2 and 3.8.2.4 Actions is to isolate the containment to minimize any release from the plant if an event were to occur during shutdown conditions. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. The proposed Required Actions require the suspension of movement of irradiated fuel assemblies, the suspension of operations involving positive reactivity additions that could result in the loss of required SDM or boron concentration, the initiation of actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status, and the declaration of the associated required decay heat removal subsystems(s) inoperable and not in operation. Suspending the movement of irradiated fuel assemblies will prevent a fuel handling accident from occurring. Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. The requirement to initiate action to restore required AC, DC, and AC instrument bus electrical power distribution subsystems to OPERABLE status will place the plant in compliance with the LCO in an expeditious manner. Declaration of the associated required shutdown cooling subsystem(s) inoperable and not in operation will require the plant to enter the applicable LCOs to apply additional Required Actions. The proposed actions will also minimize the potential for any accident releases outside of the containment and are considered acceptable in lieu of the current action to restore containment integrity within 8 hours. The actions may be considered somewhat more restrictive since immediate action is required, however, is classified as less restrictive since the current actions to restore containment integrity have been deleted. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L03 **Unit 2 only:** *(Category 4 – Relaxation of Required Action)* CTS 3.8.3.2 ACTION states, in part, “With any of the above required electrical busses not energized in the required manner, immediately suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity changes that could result in loss of required SHUTDOWN MARGIN or boron concentration, or movement of irradiated fuel.” ITS 3.8.10 ACTIONS do not include the requirement to suspend CORE ALTERATIONS. This changes the CTS by removing the Required Action to suspend all operations involving CORE ALTERATIONS.

The purpose of the CTS 3.8.3.2 ACTION is to minimize the possibility of an event that may require the electrical power source to mitigate the consequences of a design basis event. CORE ALTERATIONS is defined in CTS 1.9, in part, as "the movement or manipulation of any fuel, sources, reactivity control components, or other components affecting reactivity, within the reactor vessel with the head removed and fuel in the vessel." Core Alterations only occur when the reactor vessel head is removed - it only applies in MODE 6. There is only one accident considered during MODE 6 that involves a Core Alteration - a fuel handling accident. According to UFSAR Section 15.7.4.1.2, a fuel handling accident is initiated by the dropping of an irradiated fuel assembly either in the containment or in the fuel handling building. Suspension of CORE ALTERATIONS, except for suspension of movement of irradiated fuel, will not prevent or impair the mitigation of a fuel handling accident.

This change is acceptable because the possibility of damage to a fuel assembly because of mishandling components other than an irradiated fuel assembly is minimized by thorough training, detailed procedures, and equipment design. The PSL crane design precludes the handling of heavy objects, such as shipping casks, over the spent fuel pool storage racks. Administrative controls prevent the movement of heavy loads over the cask pit whenever the cask pit rack is installed in the cask area of the spent fuel storage pool. In addition, the cask handling crane design meets the regulatory guidance for single-failure-proof cranes in NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants" and NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." Administrative controls that control of movement of light loads or prevent movement of light loads over irradiated fuel assemblies are similar to those used for control of heavy loads, to the extent practicable, as advised in NUREG 0612. Consequently, the possibility of dropping a load other than an irradiated fuel assembly and damaging of fuel assemblies in the spent fuel storage pool is remote. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 **Unit 2 only:** *(Category 4 – Relaxation of Required Action)* Unit 2 CTS 3.8.3.2 ACTION requires, in part, with any of the specified electrical busses not energized in the required manner, venting of the RCS through a 3.58 square inch vent within 8 hours. ITS 3.8.10 does not include the venting requirement.

The purpose of CTS is to ensure the minimum electrical power distribution buses are OPERABLE. CTS 3.4.9.3 provides specific OPERABILITY requirements for overpressure protection systems when in MODE 5 and MODE 6 with the reactor vessel head on. The definition of OPERABLE in CTS 1.19 requires necessary electrical power to components so they can perform their required safety function. This change is acceptable because CTS 3.4.9.3 Action a.1 requires depressurization and venting of the RCS when adequate pressure relief methods are inoperable, including the loss of electrical power necessary to support the required pressure relief components. ITS 3.4.12 retains the requirement to depressurize and establish the required RCS vent size (Refer to ITS 3.4.12 for any changes to CTS 3.4.9.3 requirements). Therefore, the CTS 3.8.1.2 action to depressurize the RCS and vent through a greater than or equal to 3.58 square inch vent is unnecessary. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

3.8.2.2
3.8.2.4
DOC M01
DOC L01

LCO 3.8.10 The necessary portion of AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE. ①

Applicability
DOC M02

APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies. ②

ACTIONS

--NOTE--

DOC M02 LCO 3.0.3 is not applicable.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION DOC M01 DOC L02	A. One or more required AC, DC, or AC ~~vital~~ instrument bus electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately	①
		<u>OR</u>		
DOC L02		A.2.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately	②
		<u>AND</u>		
DOC L02		A.2.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately	
		<u>AND</u>		

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L02		A.2.3 Initiate actions to restore required AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems to OPERABLE status.	Immediately	①
		<u>AND</u>		
DOC L02 DOC M04		A.2.4 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately	

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.8.2.2 4.8.2.4.2 DOC L01 DOC M03	SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems.	~~[7 days~~ ~~<u>OR</u>~~ In accordance with the Surveillance Frequency Control Program ~~]~~	① ②

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

3.8.3.2 DOC M01 DOC L01 LCO 3.8.10 The necessary portion of AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE. ①

Applicability DOC M02 APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies. ②

ACTIONS

--NOTE--

DOC M02 LCO 3.0.3 is not applicable.

ACTION DOC M02 DOC L03

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC ~~vital~~ instrument bus electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately
	AND	
	A.2.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	

① ②

CTS

ACTIONS (continued)

DOC M04 ①

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.3 Initiate actions to restore required AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems to OPERABLE status.	Immediately
	AND	
	A.2.4 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

4.8.3.2
DOC L01
① ②

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.10, DISTRIBUTION SYSTEMS - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems - Shutdown

BASES

BACKGROUND

A description of the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems - Operating." ①

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. ① ② ①

The OPERABILITY of the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY. ①

The OPERABILITY of the minimum AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems during MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies, ensures that: ① ②

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel. Due to radioactive decay, AC, DC, and AC vital bus electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~. ②

The AC and DC electrical power distribution systems satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific unit condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical power distribution ~~system~~ subsystems necessary to support OPERABILITY of required systems, equipment and components - all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY. ①

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents ~~[involving handling recently irradiated fuel]~~). ②

APPLICABILITY

The AC and DC electrical power distribution subsystems required to be OPERABLE in MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies, provide assurance that: ②

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel 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, ②

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 and refueling condition.

The AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystem requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9. ①

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

BASES

ACTIONS (continued)

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

Although redundant required features may require redundant trains of electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution subsystem train may be capable of supporting sufficient required features to allow continuation of ~~[recently]~~ irradiated ② fuel movement. By allowing the option to declare required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystems LCO's Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend movement of ~~[recently]~~ irradiated fuel assemblies, and operations ② involving positive reactivity additions that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron 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 shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required shutdown cooling (SDC) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.~~4~~3 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the SDC ACTIONS would not be entered. Therefore, Required Action A.2.~~5~~4 is provided to direct declaring SDC inoperable, which results in taking the appropriate SDC actions. ③

BASES

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution system is functioning properly, with all the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. ①

~~[The 7 day Frequency takes into account the redundant capability of the electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~ ②

~~OR~~

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

~~REVIEWER'S NOTE~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~]~~ ②

REFERENCES

1. U FSAR, Chapter ~~[~~6~~]~~.

2. U FSAR, Chapter ~~[~~15~~]~~. ② ①

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems - Shutdown

BASES

BACKGROUND

A description of the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems - Operating." ①

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the U FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC ~~vital~~ instrument bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. ① ② ①

The OPERABILITY of the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY. ①

The OPERABILITY of the minimum AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems during MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies, ensures that: ① ②

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a fuel handling accident ~~[involving handling recently irradiated fuel. Due to radioactive decay, AC, DC, and AC vital bus electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~. ②

The AC and DC electrical power distribution systems satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific unit condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical power distribution ~~system~~ subsystems necessary to support OPERABILITY of required systems, equipment and components - all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY. ①

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents ~~[involving handling recently irradiated fuel]~~). ②

APPLICABILITY

The AC and DC electrical power distribution subsystems required to be OPERABLE in MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies, provide assurance that: ②

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel 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, ②

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 and refueling condition.

The AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystem requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9. ①

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

BASES

ACTIONS (continued)

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

Although redundant required features may require redundant trains of electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution subsystem train may be capable of supporting sufficient required features to allow continuation of ~~[recently]~~ irradiated fuel movement. ② By allowing the option to declare required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystems LCO's Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend movement of ~~[recently]~~ irradiated fuel assemblies, and operations ② involving positive reactivity additions that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron 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 shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required shutdown cooling (SDC) subsystem may be 3 inoperable. In this case, Required Actions A.2.1 through A.2.~~4~~ do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the SDC ACTIONS would not be ③ 4 entered. Therefore, Required Action A.2.~~5~~ is provided to direct declaring SDC inoperable, which results in taking the appropriate SDC actions.

BASES

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution system is functioning properly, with all the buses energized. The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. ①

~~[The 7 day Frequency takes into account the redundant capability of the electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.~~ ②

~~OR~~

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ④
~~---]~~ ②

REFERENCES

1. UFSAR, Chapter ~~[~~6~~]~~.
2. UFSAR, Chapter ~~[~~15~~]~~.

② ①

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.10 BASES, DISTRIBUTION SYSTEMS - SHUTDOWN

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Changes are made to the Bases to reflect the Specification.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.10, DISTRIBUTION SYSTEMS – SHUTDOWN

There are no specific No Significant Hazards Considerations for this Specification.