2

INSERT 3

With the required train of DC electrical power sources inoperable, the minimum required DC electrical power source is not available.

BASES

ACTIONS (continued)

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 train ~~subsystem[s]~~ and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the unit safety systems. 1

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power. INSERT 4 3

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 requires performance of all Surveillances required by SR 3.8.4.1 through SR 3.8.4.3. Therefore, 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.~~ 4

REFERENCES U

1. FSAR, Chapter ~~[~~6~~]~~. 1 2
2. FSAR, Chapter ~~[~~15~~]~~.

3

INSERT 4

B.1

If one or more DG DC electrical power subsystems are inoperable, the associated DGs may be incapable of performing their intended function and must be immediately declared inoperable. This declaration also requires entry into the applicable Conditions and Required Actions for inoperable DGs, LCO 3.8.2, "AC Sources – Shutdown".

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 Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The ISTS Bases have been revised to include discussions of the LCO and ACTION requirements for the diesel generator (DG) DC electrical power subsystems to be consistent with the changes made to the Specification.

4. Changes have been made to be consistent with changes made to the Specifications.

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.

Enclosure 2, Volume 13, Rev. 0, Page 393 of 638

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.

Enclosure 2, Volume 13, Rev. 0, Page 395 of 638

ATTACHMENT 6

ITS 3.8.6, BATTERY PARAMETERS

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

ITS

A01

ITS 3.8.6

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

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. Four separate and independent diesel generator sets each with:

1. Two diesels driving a common generator

2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel, per tank

See ITS 3.8.1

3. A separate fuel storage system containing a minimum volume of 62,000 gallons of fuel,

See ITS 3.8.3

4. A separate fuel transfer pump, and

See ITS 3.8.1

5. A separate 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger.

See ITS 3.8.4 and 3.8.9

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

When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE.

A02

Applicability

ACTION:

Add proposed ACTIONS Note

A03

ACTIONS

a. With one offsite A.C. circuit of the above required A.C. electrical power source inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter. Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b.# With diesel generator set(s) 1A-A and/or 2A-A or 1B-B and/or 2B-B of the above required A.C. electrical power sources inoperable,* demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter, and determining OPERABLE diesel generator sets are not inoperable due to common cause failure or performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours; restore at least four diesel generator sets to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.8.1

Add proposed ACTIONS A, B, C, D, E, and F.

L01

Required actions, to verify OPERABLE diesel generator sets are not inoperable due to common cause failure or perform SR 4.8.1.1.2.a.4, shall be completed if this action is entered.

* No more than one diesel generator may be made simultaneously inoperable on a pre-planned basis for maintenance, modifications, or surveillance testing.

@ Offsite circuits utilizing USST 2A and USST 2B as the normal power sources require CSST A and CSST C to be available as the alternate power sources via automatic transfer at the associated 6.9 kV Unit Boards. (CSST B can be substituted for CSST A or CSST C.) This Note remains in effect until November 30, 2013, or until the USST modifications are implemented on Units 1 and 2, whichever occurs first.

See ITS 3.8.1

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying the diesel generator operates for at least 24 hours. During the first 2 hours to 2.25 hours of this test, the diesel generator shall be loaded between 4620 kw and 4840 kw and between 2380 kvar and 2600 kvar and during the remaining hours of this test, the diesel generator shall be loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar.

   The generator voltage and frequency shall be ≥ 6800 volts and ≥ 58.8 Hz within 10 seconds after the start signal. After energization, the steady state generator voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

   See ITS 3.8.1

4. Within 5 minutes of shutting down the diesel generator after it has operated ≥ 2 hours loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar, verify that the diesel generator starts within 10 seconds after receipt of the start signal and operates for greater than or equal to 5 minutes. After energization, the steady state voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

   See ITS 3.8.1

See ITS 3.8.4 and 3.8.9

4.8.1.1.3 The 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger for each diesel generator shall be demonstrated OPERABLE:

a. ~~At least once per 7 days~~ by verifying:

   In accordance with the Surveillance Frequency Control Program — LA01

   ~~31 days~~ for pilot cell float voltage — L02

SR 3.8.6.1
SR 3.8.6.2

1. That the parameters in Table 4.8-1a meet the Category A limits.

2. That the total battery terminal voltage is greater than or equal to 124-volts on float charge.

   See ITS 3.8.4 and 3.8.5

SR 3.8.6.3, SR 3.8.6.4, SR 3.8.6.5

b. ~~At least once per 92 days~~ by:

   ~~31 days~~ for electrolyte level and temperature — M01

   In accordance with the Surveillance Frequency Control Program — LA01

SR 3.8.6.3, SR 3.8.6.5

1. Verifying that the parameters in Table 4.8-1a meet the Category B limits,

~~2. Verifying there is no visible corrosion at either terminals or connectors, or the cell to terminal connection resistance of these items is less than 150 x 10^{-6} ohms, and~~ — L03

SR 3.8.6.4

3. Verifying ~~that the average electrolyte temperature of 6 connected cells~~ is ~~above 60°F~~.

   each battery pilot cell temperature — L04

   greater than or equal to minimum established design limits — LA02

~~c. At least once per 18 months by verifying that:~~

~~1. The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.~~

~~2. The battery to battery and terminal connections are clean, tight and coated with anti-corrosion material.~~

~~3. The resistance of each cell to terminal connection is less than or equal to 150 x 10^{-6} ohms.~~

L03

~~Add proposed SR 3.8.6.7 with a Frequency of 60 months~~ — M02

In accordance with the Surveillance Frequency Control Program — LA01

4.8.1.1.4 This surveillance has been deleted.

December 16, 1998

Enclosure 2, Volume 13, Rev. 0, Page 399 of 638

A01

TABLE 4.8-1

DIESEL GENERATOR RELIABILITY

THIS PAGE INTENTIONALLY DELETED

Enclosure 2, Volume 13, Rev. 0, Page 400 of 638

A01

TABLE 4.8.1a

DIESEL GENERATOR BATTERY SURVEILLANCE REQUIREMENTS

L01

Parameter	CATEGORY A(1) Limits for each designated pilot cell	CATEGORY A(1) Limits for each connected cell	CATEGORY B(2) Allowable(3) value for each connected cell
Electrolyte Level (SR 3.8.6.3)	~~>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~~ greater than or equal to the minimum established design limits
Float Voltage (SR 3.8.6.2, SR 3.8.6.5)	≥ ~~2.13~~ volts	≥ 2.13 volts(C)	≥ ~~2~~ 2.07 volts
Specific Gravity(a) (SR 3.8.6.1)	≥ 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)

L05

L06

LA03

L07

See ITS 5.5.15

2.07

L08

L09

~~(a) Corrected for electrolyte temperature and level.~~

(b) Or battery charging current is less than ~~2~~ amp~~s~~. (SR 3.8.6.1)

(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 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 they are within their allowable values and provided the parameter(s) are restored to within limits within 7 days.~~

~~(3) Any Category B parameter not within its allowable value indicates an inoperable battery.~~

M03

1

See ITS 5.5.15

L01

ATTACHMENT TO TABLE 4.8-1

DIESEL GENERATOR REQUALIFICATION PROGRAM

THIS PAGE INTENTIONALLY DELETED

ITS

A01

ITS 3.8.6

ELECTRICAL POWER SYSTEMS

SHUTD0WN

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

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. Diesel generator sets 1A-A and 2A-A or 1B-B and 2B-B each with:

1. Two diesels driving a common generator,

2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel per tank,

See ITS 3.8.2

3. A fuel storage system containing a minimum volume of 62,000 gallons of fuel,

See ITS 3.8.3

4. A fuel transfer pump, and

See ITS 3.8.2

5. A separate 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger.

See ITS 3.8.5 and 3.8.10

Applicability

APPLICABILITY: ~~MODES 5 and 6.~~

When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE.

A02

ACTION:

Add proposed ACTIONS Note

A03

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS and suspend operations involving positive reactivity additions that could result in loss of required shutdown margin or boron concentration.

See ITS 3.8.2

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

4.8.1.2 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 4.8.1.1.2.a.5), and 4.8.1.1.3.

See ITS 3.8.2

ITS

A01

ITS 3.8.6

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTI0N - OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

3.8.2.3 The following D.C. vital battery channels shall be energized and OPERABLE:

CHANNEL I	Consisting of 125 - volt D.C. board No. I, 125 - volt D.C. battery bank No. I* and a full capacity charger.
CHANNEL II	Consisting of 125 - volt D.C. board No. II, 125 - volt D.C. battery bank No. II*, and a full capacity charger.
CHANNEL III	Consisting of 125 - volt D.C. board No. III, 125 - volt D.C. battery bank No. III*, and a full capacity charger.
CHANNEL IV	Consisting of 125 - volt D.C. board No. IV, 125 - volt D.C. battery bank No. IV*, and a full capacity charger.

See ITS 3.8.4 and 3.8.9

A02

Applicability

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

When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE.

ACTION:

Add proposed ACTIONS Note

A03

a. With one 125-volt D.C. board inoperable, restore the inoperable board to OPERABLE status 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

b. With one 125-volt D.C. battery bank and/or its charger inoperable, restore the inoperable battery bank and/or charger to OPERABLE status 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 3.8.4

Add proposed ACTIONS A, B, C, D, E and F.

L01

*D.C. Battery Bank V may be substituted for any other Battery Bank as needed.

See ITS 3.8.4

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

4.8.2.3.1 Each D.C. bus train shall be determined OPERABLE and energized with tie breakers open between redundant busses at least once per 7 days by verifying correct breaker alignment, indicated power availability from the charger and battery, and voltage on the bus of greater than or equal to 125 volts.

See ITS 3.8.9

See ITS 3.8.4

4.8.2.3.2* Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

L02

a. ~~At least once per 7 days~~ by: ~~31 days~~ for pilot cell float voltage

In accordance with the Surveillance Frequency Control Program

LA01

SR 3.8.6.1, SR 3.8.6.2

1. Verifying that the parameters in Table 4.8-2 meet the Category A limits, and

2. Verifying total battery terminal voltage is greater than or equal to 129-volts on float charge.

See ITS 3.8.4

In accordance with the Surveillance Frequency Control Program

LA01

SR 3.8.6.3, SR 3.8.6.4, SR 3.8.6.5

b. ~~At least once per 92 days and within 7 days after a battery discharge (battery terminal voltage below 110 volts), or battery overcharge (battery terminal voltage above 150 volts), by:~~ ~~31 days~~ for electrolyte level and temperature

M01

L10

SR 3.8.6.3, SR 3.8.6.5

1. Verifying that the parameters in Table 4.8-2 meet the Category B limits,

~~2. Verifying there is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150 x 10^{-6} ohms, and~~

L03

SR 3.8.6.4

3. Verifying ~~that the average~~ electrolyte temperature ~~of 6 connected cells~~ is ~~above 60°F~~.

each battery pilot cell temperature

L04

greater than or equal to minimum established design limits

LA02

~~c. At least once per 18 months 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. The resistance of each cell-to-terminal connection is less than or equal to 150 x 10^{-6} ohms, and~~

L03

4. The battery charger will supply at least 150 amperes at 125 volts for at least 4 hours.

See ITS 3.8.4

* This surveillance includes Battery Bank V, but not charger V.

See ITS 3.8.4

ITS

A01

ITS 3.8.6

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

Add proposed SR 3.8.6.6 Note — M04

d. At least once per 18 months by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for 2 hours when the battery is subjected to a battery service test. — See ITS 3.8.4

In accordance with the Surveillance Frequency Control Program — LA01

SR 3.8.6.6

e. ~~At least once per 60 months~~ by verifying that the battery capacity is at least 82% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test. — 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~~. — L11, LA04

Add proposed SR 3.8.6.6 third Frequency — L12

ITS

A01

ITS 3.8.6

TABLE 4.8.2

BATTERY SURVEILLANCE REQUIREMENTS

L01

Parameter	CATEGORY A(1) Limits for each designated pilot cell	CATEGORY B(2) Limits for each connected cell	CATEGORY B(2) Allowable(3) value for each connected cell
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~~	~~Above top of plates, and not overflowing~~ greater than or equal to the minimum established design limits
SR 3.8.6.2, SR 3.8.6.5 Float Voltage	≥ ~~2.13~~ volts (2.07)	≥ 2.13 volts (c)	≥ ~~>~~ 2.07 volts
SR 3.8.6.1 ~~Specific Gravity(a)~~	≥ ~~1.200~~ (b)	~~≥ 1.195~~ ~~Average of all connected cells > 1.205~~	~~Not more than .020 below the average of all connected cells~~ ~~Average of all connected cells > 1.195(b)~~

L05 L06 LA03 L08 L07 See ITS 5.5.15 L09

~~(a) Corrected for electrolyte temperature and level.~~

SR 3.8.6.1 (b) Or battery charging current is less than 2 amps.

(c) Corrected for average electrolyte temperature.

See ITS 5.5.15

~~(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 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 they are within their allowable values and provided the parameter(s) are restored to within limits within 7 days.~~

~~(3) Any Category B parameter not within its allowable value indicates an inoperable battery.~~

L01

ITS

A01

ITS 3.8.6

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

3.8.2.4 As a minimum, the following D.C. electrical equipment and boards shall be energized and 0PERABLE:

2 - 125-volt D.C. boards either I and III or II and IV, and

2* - 125-volt battery banks and chargers, one associated with each operable D.C. board

See ITS 3.8.5 and 3.8.10

Applicability

APPLICABILITY: ~~MODES 5 and 6.~~

When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE.

A02

ACTION:

Add proposed ACTIONS Note

A03

With less than the above complement of D.C. equipment and board 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. vital battery boards shall be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and indicated power availability with an overall battery voltage of greater than or equal to 125 volts.

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 D.C. vital battery banks and chargers sha11 be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2.

* D.C. Battery Bank V may be substituted for any other Battery Bank.

See ITS 3.8.5

ITS

A01

ITS 3.8.6

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

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. Four separate and independent diesel generator sets each with:

1. Two diesels driving a common generator
2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel, per tank
3. A separate fuel storage system containing a minimum volume of 62,000 gallons of fuel,
4. A separate fuel transfer pump, and
5. A separate 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger.

See ITS 3.8.1

See ITS 3.8.3

See ITS 3.8.1

See ITS 3.8.4 and 3.8.9

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

When associated Vital DC or DG DC electrical power subsystems are required to be OPERABLE.

A02

Applicability

ACTION:

Add proposed ACTIONS Note

A03

ACTIONS

a. With one offsite A.C. circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter. Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b.# With diesel generator set(s) 1A-A and/or 2A-A or 1B-B and/or 2B-B of the above required A.C. electrical power sources inoperable,* demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter, and determining OPERABLE diesel generator sets are not inoperable due to common cause failure or performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours; restore at least four diesel generator sets to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.8.1

Add proposed ACTIONS A, B, C, D, E, and F.

L01

Required actions, to verify OPERABLE diesel generator sets are not inoperable due to common cause failure or perform SR 4.8.1.1.2.a.4, shall be completed if this action is entered.

* No more than one diesel generator may be made simultaneously inoperable on a pre-planned basis for maintenance, modifications, or surveillance testing.

@ Offsite circuits utilizing USST 2A and USST 2B as the normal power sources require CSST A and CSST C to be available as the alternate power sources via automatic transfer at the associated 6.9 kV Unit Boards. (CSST B can be substituted for CSST A or CSST C.) This Note remains in effect until November 30, 2013, or until the USST modifications are implemented on Units 1 and 2, whichever occurs first.

See ITS 3.8.1

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying the diesel generator operates for at least 24 hours. During the first 2 hours to 2.25 hours of this test, the diesel generator shall be loaded between 4620 kw and 4840 kw and between 2380 kvar and 2600 kvar and during the remaining hours of this test, the diesel generator shall be loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar.

   The generator voltage and frequency shall be ≥ 6800 volts and ≥ 58.8 Hz within 10 seconds after the start signal. After energization, the steady state generator voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

   See ITS 3.8.1

4. Within 5 minutes of shutting down the diesel generator after it has operated ≥ 2 hours loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar, verify that the diesel generator starts within 10 seconds after receipt of the start signal and operates for greater than or equal to 5 minutes. After energization, the steady state voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

   See ITS 3.8.1

4.8.1.1.3 The 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger for each diesel generator shall be demonstrated OPERABLE:

   See ITS 3.8.4 and 3.8.9

a. ~~At least once per 7 days~~ by verifying:

   In accordance with the Surveillance Frequency Control Program — LA01

   ~~31 days~~ for pilot cell float voltage — L02

SR 3.8.6.2 1. That the parameters in Table 4.8-1a meet the Category A limits.

2. That the total battery terminal voltage is greater than or equal to 124 volts on float charge.

   See ITS 3.8.4 and 3.8.5

SR 3.8.6.3, SR 3.8.6.4, SR 3.8.6.5 b. ~~At least once per 92 days~~ by:

   ~~31 days~~ for electrolyte level and temperature — M01

   In accordance with the Surveillance Frequency Control Program — LA01

SR 3.8.6.3, SR 3.8.6.5 1. Verifying that the parameters in Table 4.8-1a meet the Category B limits,

~~2. Verifying there is no visible corrosion at either terminals or connectors, or the cell to terminal connection resistance of these items is less than 150 x 10^{-6} ohms, and~~ — L03

   each battery pilot cell temperature — L04

SR 3.8.6.4 3. Verifying ~~that the average electrolyte temperature of 6 connected cells~~ is ~~above 60°F~~.

   greater than or equal to minimum established design limits — LA02

~~c. At least once per 18 months by verifying that:~~

~~1. The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.~~

~~2. The battery to battery and terminal connections are clean, tight and coated with anti-corrosion material.~~ — L03

~~3. The resistance of each cell to terminal connection is less than or equal to 150 x 10^{-6} ohms.~~

   Add proposed SR 3.8.6.7 with a Frequency of ~~60 months~~ — M02

   In accordance with the Surveillance Frequency Control Program — LA01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.4 This surveillance has been deleted.

Enclosure 2, Volume 13, Rev. 0, Page 411 of 638

TABLE 4.8-1

DIESEL GENERATOR RELIABILITY

THIS PAGE INTENTIONALLY DELETED

ITS A01 ITS 3.8.6

TABLE 4.8-1a

DIESEL GENERATOR BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEROGY A(1)	CATEGORY B(2)	
	Limit for each designated pilot cell	Limits for each connected cell	Allowable(3) value for each connected cell
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~~	~~Above top of plates, and not overflowing~~
Float Voltage	≥ ~~2.13~~ 2.07 volts	≥ 2.13 volts(c)	~~></~~ ≥ 2.07 volts
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)~~

~~(a) Corrected for electrolyte temperature and level.~~

SR 3.8.6.1 (b) Or battery charging current is less than ~~2~~ 1 amp~~s~~.

(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 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 they are within their allowable values and provided the parameter(s) are restored to within limits within 7 days.~~

~~(3) Any Category B parameter not within its allowable value indicates an inoperable battery.~~

L01 L05 L08 L01 INSERT 1 LA03 L06 See ITS 5.5.15 ≥ L07 L09 M03 See ITS 5.5.15 L01

LA03

INSERT 1

greater than or equal to the minimum established design limits

ATTACHMENT TO TABLE 4.8-1

DIESEL GENERATOR REQUALIFICATION PROGRAM

THIS PAGE INTENTIONALLY DELETED

ITS

A01

ITS 3.8.6

ELECTRICAL POWER SYSTEMS

SHUTDOWN

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

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. Diesel generator sets 1A-A and 2A-A or 1B-B and 2B-B each with:

1. Two diesels driving a common generator,

2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel per tank,

See ITS 3.8.2

3. A fuel storage system containing a minimum volume of 62,000 gallons of fuel,

See ITS 3.8.3

4. A fuel transfer pump, and

See ITS 3.8.2

5. A separate 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger.

See ITS 3.8.5 and

Applicability

APPLICABILITY: ~~MODES 5 and 6~~.

When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE.

A02

ACTIONS

ACTION:

Add proposed ACTIONS Note

A03

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS and suspend operations involving positive reactivity additions that could result in loss of required shutdown margin or boron concentration.

See ITS 3.8.2

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

4.8.1.2 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 4.8.1.1.2.a.5), and 4.8.1.1.3.

See ITS 3.8.2

ITS A01 ITS 3.8.6

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6 — A02

3.8.2.3 The following D.C. vital battery channels shall be OPERABLE and energized:

CHANNEL I	Consisting of 125 -volt D.C. board No. I, 125 - volt D.C. battery bank No. I* and a full capacity charger.
CHANNEL II	Consisting of 125 - volt D.C. board No. II, 125 - volt D.C. battery bank No. II*, and a full capacity charger.
CHANNEL III	Consisting of 125 - volt D.C. board No. III, 125 - volt D.C. battery bank No. III*, and a full capacity charger.
CHANNEL IV	Consisting of 125 - volt D.C. board No. IV, 125 - volt D. C. battery bank No. IV*, and a full capacity charger.

See ITS 3.8.4 and 3.8.9

Applicability

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

When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE. — A02

ACTION:

Add proposed ACTIONS Note — A03

a. With one 125-volt D.C. board inoperable or not energized, restore the inoperable board to OPERABLE and energized status 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

b. With one 125-volt D.C. battery bank and/or its charger inoperable or not energized, restore the inoperable battery bank and/or charger to OPERABLE and energized status 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 3.8.4

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 with tie breakers open between redundant busses at least once per 7 days by verifying correct breaker alignment, indicated power availability from the charger and battery, and voltage on the bus of greater than or equal to 125 volts. — 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. ~~At least once per 7 days~~ by:

~~31 days~~ for pilot cell float voltage — L02

In accordance with the Surveillance Frequency Control Program — LA01

SR 3.8.6.2

1. Verifying that the parameters in Table 4.8-2 meet the Category A limits, and

* D.C. Battery Bank V may be substituted for any other Battery Bank as needed.
** This surveillance includes Battery Bank V, but not Charger V. — See ITS 3.8.4

ITS A01 ITS 3.8.6

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

2. Verifying total battery terminal voltage is greater than or equal to 129-volts on float charge. — See ITS 3.8.4

SR 3.8.6.3, SR 3.8.6.4, SR 3.8.6.5

b. ~~At least once per 92 days and within 7 days after a battery discharge (battery terminal voltage below 110-volts), or battery overcharge (battery terminal voltage above 150-volts), by:~~ — L10

~~31 days~~ for electrolyte level and temperature — M01

SR 3.8.6.3, SR 3.8.6.5

1. Verifying that the parameters in Table 4.8-2 meet the Category B limits, — LA01

In accordance with the Surveillance Frequency Control Program

2. ~~Verifying there is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150 x 10^{-6} ohms, and~~ — L03

SR 3.8.6.4

3. Verifying ~~that the average electrolyte temperature of 6 connected cells~~ each battery pilot cell temperature — L04 is ~~above 60°F~~ greater than or equal to minimum established design limits — LA02.

~~c. At least once per 18 months 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. The resistance of each cell-to-terminal connection is less than or equal to 150 x 10^{-6} ohms, and~~ — L03

4. The battery charger will supply at least 150 amperes at 125-volts for at least 4 hours. — See ITS 3.8.4

d. At least once per 18 months by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for 2 hours when the battery is subjected to a battery service test. — See ITS 3.8.4

In accordance with the Surveillance Frequency Control Program — LA01

SR 3.8.6.6

e. ~~At least once per 60 months~~ by verifying that the battery capacity is at least 82% of the manufacturer's rating when subjected to a performance discharge test. ~~Once per 60 month~~ interval, this performance discharge test may be performed in lieu of the battery service test. — See ITS 3.8.4

or a modified performance discharge test

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. — L11

~~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.~~ — LA04

Add proposed SR 3.8.6.6 Note — M04

Add proposed SR 3.8.6.6 third Frequency — L12

ITS A01 ITS 3.8.6

TABLE 4.8-2

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEROGY A(1)	CATEGORY B(2)	
	Limit for each designated pilot cell	Limits for each connected cell	Allowable(3) value for each connected cell
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~~	~~Above top of plates, and not overflowing~~
SR 3.8.6.2, SR 3.8.6.5 Float Voltage	≥ ~~2.13~~ 2.07 volts	≥ 2.13 volts(c)	~~≥~~ 2.07 volts
SR 3.8.6.1 ~~Specific Gravity(a)~~	~~≥ 1.200~~(b)	~~≥ 1.195~~ ~~Average of all connected cells > 1.205~~	~~Not more than .020 below the average of all connected cells~~ ~~Average of all connected cells ≥ 1.195(b)~~

~~(a) Corrected for electrolyte temperature and level.~~

SR 3.8.6.1 (b) Or battery charging current is less than 2 amps.

(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 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 they are within their allowable values and provided the parameter(s) are restored to within limits within 7 days.~~

~~(3) Any Category B parameter not within its allowable value indicates an inoperable battery.~~

L05 L01 L08 L01 LA03 INSERT 2 L06 See ITS 5.5.15 2.07 ≥ L07 L09 See ITS 5.5.15 L01

LA03

INSERT 2

greater than or equal to the minimum established design limits

ITS

A01

ITS 3.8.6

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.6

A02

3.8.2.4 As a minimum, the following D.C. electrical equipment and boards shall be and OPERABLE and energized:

2 - 125-volt D.C. boards either I and III or II and IV, and

2* - 125-volt battery banks and chargers, one associated with each operable D.C. board

See ITS 3.8.5 and 3.8.10

Applicability

APPLICABILITY: ~~MODES 5 and 6~~.

A02

When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE.

ACTIONS

ACTION:

Add proposed ACTIONS Note

A03

With less than the above complement of D.C. equipment and board OPERABLE and energized, 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. vital battery boards shall be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and voltage on the board with an overall battery voltage of greater than or equal to 125 volts.

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 D.C. vital battery banks and chargers shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2.

* D.C. Battery Bank V may be substituted for any other Battery Bank.

See ITS 3.8.5

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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-1431, Rev. 4.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.8.1.1 and CTS 3.8.2.3 are applicable during MODES 1, 2, 3, and 4. CTS 3.8.1.2 and CTS 3.8.2.4 are applicable during MODES 5 and 6. ITS LCO 3.8.6 requires the battery parameters for the Vital DC and diesel generator (DG) batteries to be within limits when the associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE. This changes the CTS by combining the requirements for the Vital Battery and DG battery parameters into one Specification and replacing the actual MODES with the phrase "When associated Vital DC and DG 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 CTS 3.8.1.1, 3.8.1.2, 3.8.2.3, and 3.8.2.4 requirements for the DG and Vital 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 Vital or DG 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.

A03 CTS 3.8.1.1 and 3.8.1.2 contain ACTIONS for various combinations of DG inoperability that would be entered if its support battery is inoperable. CTS 3.8.1.1 and 3.8.2.3 each contain a table that describes battery degradation levels where separate actions are taken for each battery depending on the level of degradation. CTS 3.8.2.4 requires two of four vital batteries to be OPERABLE and if one of the two required vital batteries is inoperable operations can continue as long as the required ACTION is completed. ITS 3.8.6 ACTIONS Note states that separate entry condition is allowed for each battery. This changes the CTS by explicitly stating the intent of CTS.

The purpose of ITS 3.8.6 is to provide battery parameter requirements for safety related batteries. As in CTS, exceeding the battery parameter limits in ITS 3.8.6 is indicative of a degradation of battery capacity but the battery may still be capable of performing its intended function (i.e., OPERABLE). Compliance with

Enclosure 2, Volume 13, Rev. 0, Page 422 of 638

the Required Actions within the associated Completion Times provides assurance that there is still sufficient battery capacity to perform its intended function without considering the battery inoperable. As in CTS, if the battery parameter condition degrades such that the parameter is outside the Conditions allowed or the Required Actions are not accomplished within the associated Completion Time the battery is considered inoperable and the appropriate Condition(s) entered for the equipment the battery supports. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 4.8.1.1.3.b.1 and 4.8.2.3.2.b.1 require verification that the average electrolyte level of each battery connected cell is within limit every 92 days. ITS SR 3.8.6.3 requires verification of each battery connected cell electrolyte level is greater than or equal to minimum established design limits every 31 days. CTS ~~4.8.1.1.b.3~~ and 4.8.2.3.2.b.3 require verification that electrolyte temperature of 6 connected battery cells is within limit every 92 days. ITS SR 3.8.6.4 requires verification of each battery pilot cell temperature is greater than or equal to the minimum established design limits every 31 days. (See DOC L04 for a discussion on limiting verification of electrolyte temperature to the pilot cell.) This changes the CTS by increasing the Frequency of performance of the Surveillances from 92 days to 31 days.

SII

4.8.1.1.3.b.3

The purpose of CTS 4.8.1.1.3.b.1, 4.8.1.1.3.b.3, 4.8.2.3.2.b.1, and 4.8.2.3.2.b.3 is to ensure the electrolyte level and temperature is within the specified limit to ensure the battery plates suffer no physical damage and maintain adequate electron transfer capability. The applicable IEEE 450-2002 standard recommends a Surveillance Frequency of 31 days. The change is acceptable since it will help ensure the battery plates will not suffer physical damage and maintain adequate electron transfer capability. This change is designated as more restrictive because the Surveillance Requirement Frequencies have been increased.

M02 CTS 4.8.1.1.3 specifies the Surveillances for the DG batteries while the unit is in MODE 1, 2, 3, or 4. CTS 4.8.1.2 refers to this Specification for DG battery surveillances while in MODE 5 or 6. ITS 3.8.6 adds a new Surveillance, ITS SR 3.8.6.7 requiring verification that the DG battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test at a Frequency of 60 months or at a conditional Frequency based on specific battery conditions. (Refer to DOC LA01 for the discussion on moving the 60 month Frequency to the Surveillance Frequency Control Program.) This changes the CTS by adding a Surveillance for DG battery capacity testing.

The purpose of SR 3.8.6.7 is to test the DG battery to detect any change in the capacity, and/or to determine the battery's as-found capacity and ability to satisfy the duty cycle. IEEE 450-2002 recommends replacing the battery if its capacity is below 80% of the manufacturer's rating and if a battery cannot meet its duty cycle it is considered inoperable. This change is considered acceptable because

the Surveillance is consistent with IEEE 450-2002 and is necessary to monitor the battery for degradation and/or battery OPERABILITY. This change is designated as more restrictive because Surveillance Requirements have been added to the CTS.

M03 CTS 4.8.1.1.3.a.1 requires verification that the DG battery parameters are within the Category A limits of Table 4.8-1a. CTS Table 4.8-1a includes Category A limit for specific gravity, modified by footnote (b), which provides an alternative method of verifying the DG battery state of charge by ensuring a battery charging current of less than 2 amps. ITS SR 3.8.6.1 requires verification that DG battery float current is less than or equal to 1 amp. This changes CTS by lowering the Surveillance acceptance criterion for verifying DG battery state of charge from less than 2 amps to less than or equal to 1 amp.

The purpose of CTS 4.8.1.1.3.a.1 and Table 4.8-1a, in part, is to verify the DG batteries state of charge. The DG batteries installed at SQN are C&D Technologies, Inc. Model KCR-7. As identified in the C&D Technologies, Inc. letter to TVA, dated August 9, 2013, for the KCR-7 batteries, after a discharge, when the float current drops to less than or equal to 1 amp, the battery should be at least 98% recharged. Therefore, as recommended by the manufacturer, verification of state of charge for the DG batteries requires a lower current than is specified in CTS. This change is acceptable because the float current specified in CTS is not associated with an established percentage of state of charge for the DG batteries. Therefore, specifying a manufacturer's recommended float current to ensure the DG batteries are at least 98% recharged will ensure the DG batteries are in a fully charged state. This change is designated as more restrictive because the acceptance criteria for the DG batteries Surveillance in ITS will ensure a higher state of charge than required in CTS.

M04 CTS 4.8.2.3.2.e requires verifying that the vital battery capacity is at least 82% of the manufacturer's rating when subjected to a performance discharge test with no limitations on plant conditions under which this test can be performed. ITS 3.8.6.6 requires verifying each required vital battery capacity is ≥ 82% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test with a Note placing MODE limitations on when the test can be performed. ITS SR 3.8.6.6 Note states that this Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed on in-service vital batteries 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 adding restrictions, modified by some allowances, defining under what plant MODES the test can be performed.

The purpose of CTS 4.8.2.3.2.e is to verify the OPERABILITY of the vital DC batteries. The addition of the Note limiting the conditions in which the Surveillance can be performed is acceptable because performing the Surveillance on in-service vital batteries would perturb the electrical distribution system and challenge safety systems, although credit may be taken for unplanned events that satisfy this SR. This change is designated as more restrictive because restraints have been added limiting when a Surveillance Requirement can be performed.

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.8.1.1.3.a and 4.8.2.3.2.a require verifying pilot cell float voltage in Table 4.8-1a and Table 4.8.2 (CTS Table 4.8-2 for Unit 2) are within limits at least once per 31 days, as changed by DOC L02. CTS 4.8.1.1.b and 4.8.2.3.2.b require verifying electrolyte level in Table 4.8-1a and Table 4.8.2 (CTS Table 4.8-2 for Unit 2), and electrolyte temperature at least once per 31 days, as changed by DOC M01. CTS 4.8.2.3.2.e requires verification of battery capacity at least once per 60 months. ITS SR 3.8.6.7 is initially proposed to be added with a Frequency of 7 days as discussed in DOC M02. ITS SRs 3.8.6.1, 3.8.6.2, 3.8.6.3, 3.8.6.4, 3.8.6.5, and partially SRs 3.8.6.6 and 3.8.6.7 require a similar Surveillance and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 4.8.1.1.3.b.3 and 4.8.2.3.2.b.3 require, in part, verifying the average electrolyte temperature of 6 connected cells above 60°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 will be placed in the SQN UFSAR. This changes the CTS by moving the specified temperature value for this SR to the SQN UFSAR.

Enclosure 2, Volume 13, Rev. 0, Page 425 of 638

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

The specific limiting value for the battery electrolyte temperature is relocated to a licensee controlled document. 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. Depending on the available excess capacity of the associated battery, the minimum temperature necessary to support operability of the battery can vary. Relocating these values to the UFSAR is acceptable because these battery parameter values will continue to be controlled at their current level, changes will be evaluated in accordance with 10 CFR 50.59 and reported in accordance with 10 CFR 50.71, and actions to restore deficient values will be implemented in accordance with the TVA's corrective action program. 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.

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, as modified by DOC M01, 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 DG and vital 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 SQN UFSAR. This changes the CTS by moving the specified limits for this SR to the SQN UFSAR.

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 4.8.1a and Table 4.8.2 (CTS Table 4.8-2 for Unit 2) represent appropriate monitoring levels and appropriate preventive maintenance levels for long-term battery quality and extended battery life. Relocating these values to the UFSAR is acceptable because these battery parameter values will continue to be controlled at their current level, changes will be evaluated in accordance with 10 CFR 50.59 and reported in accordance with 10 CFR 50.71, and actions to restore deficient values will be implemented in accordance with the TVA's corrective action program. 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.

LA04 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 4.8.2.3.2.f requires the performance of a battery performance

Enclosure 2, Volume 13, Rev. 0, Page 426 of 638

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.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.8.1.1, 3.8.1.2, 3.8.2.3, and 3.8.2.4 provide ACTIONS and associated Completion Times for when a DG or Vital battery is inoperable due to battery parameters not within limits. In addition, CTS Table 4.8.1a and CTS Table 4.8.2 (CTS Table 4.8-2 for Unit 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 CTS 3.8.1.1, 3.8.1.2, 3.8.2.3, and 3.8.2.4 ACTIONS is to provide a finite period for continued operation when a DG or Vital 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 in order 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

Enclosure 2, Volume 13, Rev. 0, Page 427 of 638

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

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 parameters to within limits. ITS 3.8.6 ACTION A covers the condition of one or more batteries 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 or more batteries 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 or more batteries 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. Because with electrolyte level below the top of the plates there is a potential for dryout and plate degradation, 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 or more batteries 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 one or more batteries in redundant subsystems with battery parameters not within limits, and requires restoration of the battery parameters for one battery to within limits within 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 more batteries with one or more battery cells float voltage and float current are not within limits, if SR 3.8.6.6 is not met, or SR 3.8.6.7 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. In addition, when one or more batteries in redundant subsystems have battery parameters not within limit, only 2 hours is allowed to restore at least one subsystem's batteries before declaring the battery(ies) inoperable. 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)* CTS 4.8.1.1.3.a and 4.8.2.3.2.a require the verification that the pilot cell voltage is greater than or equal to the specified limit every 7 days. ITS SR 3.8.6.2 requires the verification of each pilot battery cell voltage every 31 days. This changes the CTS by extending the Surveillance interval for verification of pilot cell voltage from 7 days to 31 days.

Enclosure 2, Volume 13, Rev. 0, Page 428 of 638

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

The purpose of CTS 4.8.1.1.3.a and 4.8.2.3.2.a is to verify that the pilot cell voltages are within limits. ITS 3.8.6.2 ensures the pilot cell float voltages are equal to or greater than the short term absolute minimum voltage. This change extends the Surveillance Frequency from 7 days to 31 days for verification of pilot cell voltage. This change is acceptable because the new Surveillance Frequency ensures an acceptable level of equipment reliability and is consistent with the Frequency recommended in IEEE-450-2002. This change is also acceptable since ITS 5.5.15, "Battery Monitoring and Maintenance Program," has been added which requires actions to be taken to restore battery cells with float voltage < 2.13 V. This program will help ensure the cell voltage will not approach the ITS SR 3.8.6.2 limit of 2.07 V. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L03 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.8.1.1.3.b.2 and 4.8.2.3.2.b.2 require verification that there is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms. CTS 4.8.1.1.3.c and 4.8.2.3.2.c, in part, require verification that the cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration, the battery-to-battery and terminal connections are clean, tight and coated with anti-corrosion material, and the resistance of each cell-to-terminal connection is less than or equal to 150×10^{-6} ohms. 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 CTS 4.8.1.1.3.b.2, 4.8.1.1.3.c, 4.8.2.3.2.b.2, and CTS 4.8.2.3.2.c, and the Vital and DG batteries, is to ensure that the proper preventative maintenance type of battery activities are performed. 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 type 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 5.5.15, "Battery Monitoring and Maintenance Program," requires a program for battery maintenance based on the recommendations of IEEE 450-2002. The requirement to perform these battery preventative maintenance activities are consistent with IEEE 450-2002, and as such, will be maintained in the plant procedures implementing ITS 5.5.15. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

Enclosure 2, Volume 13, Rev. 0, Page 429 of 638

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

L04 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.8.1.1.3.b.3 and 4.8.2.3.2.b.3 require, in part, verifying the average electrolyte temperature of 6 connected cells is within limits. ITS SR 3.8.6.4 requires, in part, verification that each required battery pilot cell temperature is within limits. This changes the CTS by only requiring verifying the pilot cell temperature instead of the average of 6 connected cells.

The purpose of monitoring cell temperature is to monitor battery capability because as the temperature of the electrolyte increases, the internal resistance decreases and the electrochemical reaction rates increase conversely as temperature decreases. Because batteries have very large thermal inertia; the batteries are designed with significant margins (i.e., temperature, aging, and design); and there is monitoring and correction of low battery room temperatures, the pilot cell temperature is an accurate representation of the temperature of the battery bank and is adequate to ensure that the minimum electrolyte temperature is maintained. ITS 5.5.15, Battery Monitoring and Maintenance Program, requires a program that includes provisions for limits on average electrolyte temperature and battery room temperature is routinely monitored. Thus, this change is considered acceptable because electrolyte temperature limits are provided in the Battery Monitoring and Maintenance Program and the battery room temperature is routinely monitored. Therefore, the pilot cell temperature is considered a sufficiently accurate representation of the temperature of the battery bank. 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 5 – Deletion of Surveillance Requirement)* CTS 4.8.1.1.3.a.1 requires verifying the parameters in Table 4.8-1a meet Category A limits at least once per 7 days for the DG batteries. CTS 4.8.2.3.2.a.1 requires verifying the parameters in Table 4.8.2 meet Category A limits at least once per 7 days for the Vital Batteries. CTS Table 4.8-1a and Table 4.8.2 (CTS Table 4.8-2 for Unit 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." CTS 4.8.1.1.3.b.1 requires verifying the parameters in Table 4.8-1a meet Category B limits at least once per 92 days. CTS 4.8.2.3.2.b.1 requires verifying the parameters in Table 4.8-2 meet Category B limits at least once per 92 days. CTS Table 4.8-1a and Table 4.8.2 (CTS Table 4.8-2 for Unit 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 Vital and DG battery connected cell electrolyte level is greater than or equal to minimum established design limits in accordance with the Surveillance Frequency Control Program. Changes for the Frequency for verification of each connected cells electrolyte level and relocating this Frequency to the Surveillance Frequency Control Program are discussed in other DOCs. This changes the CTS by deleting the requirement to verify the pilot cells electrolyte level is within limits at least once per 7 days.

Enclosure 2, Volume 13, Rev. 0, Page 430 of 638

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

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 5.5.15, Battery Monitoring and Maintenance Program," requires a program providing controls for battery restoration and maintenance that shall be in accordance with IEEE 450-2002 as endorsed by Regulatory Guide 1.129, Revision 2, with exceptions and other provisions. IEEE 450-2002 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, "Program," 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.

L06 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.8.1.1.3.b.1 requires verifying the parameters in Table 4.8.1a meet Category B limits at least once per 92 days for the DG batteries. CTS 4.8.2.3.2.b.1 requires verifying the parameters in Table 4.8.2 (CTS Table 4.8-2 for Unit 2) meet Category B limits at least once per 92 days for the vital batteries. CTS Table 4.8.1a and Table 4.8.2 (CTS Table 4.8-2 for Unit 2) Category B contains the parameter 'Electrolyte Level' with an allowable value for each connected cell of "Above top of plates, and not overflowing." In addition Note (3) states that with any Category B parameter not within its allowable value indicates an inoperable battery. ITS SR 3.8.6.3 requires verifying each battery connected cell electrolyte level is greater or equal to minimum established design limits at a Frequency of every 31 days. (DOC M01 discusses changing the CTS Frequency of 92 days to the ISTS Frequency of 31 days. DOC LA01 discusses moving this Frequency to the Surveillance Frequency Control Program.) ITS 3.8.6 Required Action C.1 requires restoration of battery's electrolyte level to above the top of the plates within 8 hours or Condition F is entered with a Required Action to declare the associated battery inoperable immediately. This changes the CTS by relaxing the requirement of immediately declaring the battery inoperable, and allows 8 hours to restore the battery parameter to within limits before having to declare the battery inoperable.

The purpose of CTS Category B allowable value on each connected cell for electrolyte level and its related Frequency is to ensure that the plates suffer no physical damage and maintain adequate electron transfer capability to ensure the battery can perform its intended function and maintain a margin of safety.

Enclosure 2, Volume 13, Rev. 0, Page 431 of 638

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

Electrolyte level cannot decrease to below the top of the plates or be overflowing unless it has exceeded the limits prescribed in ITS SR 3.8.6.3. If battery electrolyte level is found outside the minimum established design limits ITS 3.8.6 Condition C is entered with Required Action C.1 requiring restoring electrolyte level to above the top of the plates within 8 hours or declaring the battery inoperable. With electrolyte level below the top of the plates there is a potential for dryout and plate degradation. ITS 5.5.15, Battery Monitoring and Maintenance Program," requires a program providing controls for battery restoration and maintenance that shall be in accordance with IEEE 450-2002 as endorsed by Regulatory Guide 1.129, Revision 2, with exceptions and other provisions. IEEE 450-2002 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. New Required Actions C.1 and C.2 restore the electrolyte level and ensure that the cause of the loss of electrolyte level is not due to a leak in the battery cell jar. These changes, with the additional requirements in the Battery Monitoring and Maintenance Program, are adequate to ensure that minimum electrolyte levels are maintained. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L07 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.8.1.1.3.b.1 and 4.8.2.3.2.b.1 require verification that each connected cell voltage is > 2.07 V at least every 92 days. 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 CTS 4.8.1.1.3.b.1 and 4.8.2.3.2.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 2.063 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.

Enclosure 2, Volume 13, Rev. 0, Page 432 of 638

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

L08 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.8.1.1.3.a.1 and 4.8.2.3.2.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 criteria for pilot cell voltage limits 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. 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. This changes the CTS by reducing the acceptance criteria for pilot cell voltage limits from ≥ 2.13 V to ≥ 2.07 V. At this lower 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 5.5.15, "Battery Monitoring and Maintenance Program," has been added and requires actions to be taken to restore battery cells with float voltage < 2.13 V. This program will help 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 less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L09 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.8.1.1.3.a.1 requires the verification that DG battery pilot cell specific gravity is within limit (Category A limits of Table 4.8.1a) and CTS 4.8.1.1.3.b.1 requires the verification that the DG battery connected cells specific gravity is within limits (Category B limits of Table 4.8.1a, as modified by footnote (a)). CTS 4.8.2.3.2.a.1 requires the verification that the pilot cell specific gravity is within limit (the Category A limits of Table 4.8.2 (CTS Table 4.8-2 for Unit 2), as modified by footnote (a)) and CTS 4.8.2.3.2.b.1 requires the verification that the connected cell specific gravity is within limit (the Category B limits of Table 4.8.2 (CTS Table 4.8-2 for Unit 2)). As indicated in CTS Table 4.8.1a and CTS Table 4.8.2 (CTS Table 4.8-2 for Unit 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 CTS 4.8.1.1.3.a.1, 4.8.1.1.3.b.1, 4.8.2.3.2.a.1, and 4.8.2.3.2.b.1 is to ensure the state of charge of each DG and Vital 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

Enclosure 2, Volume 13, Rev. 0, Page 433 of 638

assumed safety function. While the specified Surveillances have been deleted, the alternative Surveillances of CTS Table 4.8.1a, footnote (b), to verify DG battery float current < 2 amps, and CTS Table 4.8.2 (CTS Table 4.8-2 for Unit 2), footnote (b) to verify Vital battery float current is < 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. (See DOC M03 for the discussion on changing the DG battery float current acceptance criterion to ≤ 1 amp.) IEEE 450-2002 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.

L10 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.8.2.3.2.b requires 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 L09 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 CTS 4.8.2.3.2.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 Vital battery float current is ≤ 2 amps every 7 days. 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 5.5.15, "Battery Monitoring and Maintenance Program," requires a program for battery maintenance based on the recommendations of IEEE 450-2002. The requirement to perform these battery preventative maintenance activities are consistent with IEEE 450-2002, and as such, will be maintained in the plant procedures implementing ITS 5.5.15. This change is designated as less restrictive because Surveillances will be performed less frequently under ITS than under CTS.

L11 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.8.2.3.2.e requires the performance of a battery performance discharge test on the vital 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 CTS 4.8.2.3.2.e is to determine overall battery degradation due to age and usage. A performance test, as defined in IEEE 450-2002, 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

DISCUSSION OF CHANGES
ITS 3.8.6, BATTERY PARAMETERS

test, as defined in IEEE 450-2002, 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 450-2002, 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 450-2002 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.

L12 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.8.2.3.2.f requires an increased Frequency (Annually) from that in CTS 4.8.2.3.2.e (60 months) for vital 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 manufacture’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 CTS 4.8.2.3.2.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.

Enclosure 2, Volume 13, Rev. 0, Page 435 of 638

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

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

3.8.1.1, 3.8.1.2, 3.8.2.3, 3.8.2.4

LCO 3.8.6 Battery parameters for Train A and Train B Vital batteries and diesel generator (DG) batteries ~~electrical power subsystem~~ shall be within limits. 1

Applicability

APPLICABILITY: When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE. 1

ACTIONS

----------NOTE----------

DOC A03

Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 A. One ~~[~~or ~~two]~~ more 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. AND A.2 Perform SR 3.8.6.1. AND A.3 Restore affected cell voltage ≥ ~~[~~2.07~~]~~ V.	2 hours 2 3 2 2 hours 24 hours
DOC L01 B. One ~~[~~or ~~two]~~ more Vital batter~~[y][~~ies ~~on one subsystem]~~ with float current > ~~[~~2~~]~~ amps.	B.1 Perform SR 3.8.4.1. AND B.2 Restore Vital battery float current to ≤ ~~[~~2~~]~~ amps.	2 hours 2 3 ~~[~~12~~]~~ hours

INSERT 1 → .1

3

3

INSERT 1

DOC L01

OR One or more DG batteries with float current > 1 amp.	OR B.2.2 Restore DG battery float current to ≤ 1 amp.	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. (more)	----------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. AND C.2 Verify no evidence of leakage. AND C.3 Restore electrolyte level to greater than or equal to minimum established design limits.	8 hours 12 hours 31 days (2) (3)
DOC L01 D. One [or ~~two~~] batter[y][ies ~~on one subsystem~~] with pilot cell electrolyte temperature less than minimum established design limits. (more)	D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours (2) (3)
DOC L01 E. One or more batteries in redundant ~~subsystems~~ with battery parameters not within limits. (trains)	E.1 Restore battery parameters for batteries in one ~~subsystem~~ to within limits. (train)	2 hours (1)

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 more Vital One [or ~~two~~] batter[y][ies ~~on one subsystem~~] with one or more battery cells float voltage < [2.07] V and float current > [2] amps. INSERT 2	F.1 Declare associated battery inoperable.	Immediately

2 3

4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
4.8.1.1.3.a.1, 4.8.2.3.2.a.1 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. ---------- vital Verify each battery float current is ≤ [2] amps. and each DG battery float current is ≤ 1 amp	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

1 2 3

5

3

INSERT 2

DOC L01

OR

One or more DG batteries with one or more battery cells float voltage < 2.07 V and float current > 1 amp.

OR

SR 3.8.6.6 not met.

OR

SR 3.8.6.7 not met.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.3.a.1, 4.8.2.3.2.a.1	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, 5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	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]	5
4.8.1.1.3.b.3, 4.8.2.3.2.b.3	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]	5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	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, 5

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.6	----------NOTE---------- 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. ----------	on in-service Vital batteries (6)
4.8.2.3.2.e 4.8.2.3.2.f	Verify vital battery capacity is ≥ ~~[80~~82%~~]~~ 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 ~~]~~ (1) (2) (5) 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)

DOC M04

DOC L09

INSERT 3 → (3)

3

INSERT 3

DOC M02	SR 3.8.6.7	----------NOTE---------- Credit may be taken for unplanned events that satisfy this SR. ---------- Verify DG battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program AND 12 months when battery shows degradation, or has reached 85% of the expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

Enclosure 2, Volume 13, Rev. 0, Page 444 of 638

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

3.8.1.1, 3.8.1.2, 3.8.2.3, 3.8.2.4

LCO 3.8.6 Battery parameters for Train A and Train B Vital batteries and diesel generator (DG) batteries ~~electrical power subsystem~~ shall be within limits. (1)

Applicability

APPLICABILITY: When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE. (1)

ACTIONS

----------NOTE----------

DOC A03

Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 A. One ~~[~~or ~~two]~~ more 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. AND A.2 Perform SR 3.8.6.1. AND A.3 Restore affected cell voltage ≥ ~~[~~2.07~~]~~ V.	2 hours (2) (3) 2 hours (2) 24 hours
DOC L01 B. One ~~[~~or ~~two]~~ more Vital batter~~[y][~~ies ~~on one subsystem]~~ with float current > ~~[~~2~~]~~ amps.	B.1 Perform SR 3.8.4.1. AND B.2 Restore Vital battery float current to ≤ ~~[~~2~~]~~ amps.	2 hours ~~[~~12~~]~~ hours (2) (3) (3)

INSERT 1 → .1

3

INSERT 1

DOC L01

OR One or more DG batteries with float current > 1 amp.	OR B.2.2 Restore DG battery float current to ≤ 1 amp.	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. (more)	----------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. AND C.2 Verify no evidence of leakage. AND C.3 Restore electrolyte level to greater than or equal to minimum established design limits.	8 hours 12 hours 31 days (2) (3)
DOC L01 D. One [or ~~two~~] batter[y][ies ~~on one subsystem~~] with pilot cell electrolyte temperature less than minimum established design limits. (more)	D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours (2) (3)
DOC L01 E. One or more batteries in redundant ~~subsystems~~ with battery parameters not within limits. (trains)	E.1 Restore battery parameters for batteries in one ~~subsystem~~ to within limits. (train)	2 hours (1)

Enclosure 2, Volume 13, Rev. 0, Page 447 of 638

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 more Vital One [or ~~two~~] batter[y][ies ~~on one subsystem~~] with one or more battery cells float voltage < [2.07] V and float current > [2] amps. INSERT 2	F.1 Declare associated battery inoperable.	Immediately

2 3

4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
4.8.1.1.3.a.1, 4.8.2.3.2.a.1 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. ---------- vital Verify each battery float current is ≤ [2] amps. and each DG battery float current is ≤ 1 amp	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

1 2 3

5

3

INSERT 2

DOC L01

OR

One or more DG batteries with one or more battery cells float voltage < 2.07 V and float current > 1 amp.

OR

SR 3.8.6.6 not met.

OR

SR 3.8.6.7 not met.

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.3.a.1, 4.8.2.3.2.a.1	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, 5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	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]	5
4.8.1.1.3.b.3, 4.8.2.3.2.b.3	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]	5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	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, 5

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.6	----------NOTE---------- 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. ----------	on in-service Vital batteries (6)
DOC M04 4.8.2.3.2.e 4.8.2.3.2.f	Verify vital battery capacity is ≥ ~~[~~80~~]~~ 82% 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 ~~]~~ (1) (2) (5) AND 12 months when battery shows degradation, or has reached ~~[~~85~~]~~% of the expected life with capacity < 100% of manufacturer's rating (2) AND DOC L09 24 months when battery has reached ~~[~~85~~]~~% of the expected life with capacity ≥ 100% of manufacturer's rating (2)

INSERT 3 → (3)

Enclosure 2, Volume 13, Rev. 0, Page 451 of 638

3

INSERT 3

DOC M02	SR 3.8.6.7	----------NOTE---------- Credit may be taken for unplanned events that satisfy this SR. ---------- Verify DG battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	In accordance with the Surveillance Frequency Control Program AND 12 months when battery shows degradation, or has reached 85% of the expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating

Enclosure 2, Volume 13, Rev. 0, Page 452 of 638

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 Westinghouse 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 the differences in the acceptance criteria between the Vital batteries and the diesel generator (DG) batteries.

4. 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. Therefore, in the ISTS, LCO 3.0.3 would 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. In addition, because proposed ITS SR 3.8.6.7 is similar to ITS SR 3.8.6.6 but for different batteries, Condition F has been modified to cover the case when SR 3.8.6.7 is not met. ACTION F will require the associated battery to be declared inoperable. This is also consistent with the current Technical Specification requirements.

5. ISTS SR 3.8.6.1, ISTS SR 3.8.6.2, ISTS SR 3.8.6.3, ISTS SR 3.8.6.4, ISTS SR 3.8.6.5, and ISTS SR 3.8.6.6 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.6.1, ITS SR 3.8.6.2, ITS SR 3.8.6.3, ITS SR 3.8.6.4, ITS SR 3.8.6.5, and ITS SR 3.8.6.6 is "In accordance with the Surveillance Frequency Control Program."

6. The Note modifying ISTS SR 3.8.6.6 has be changed to reflect that no portion of the Vital battery performance discharge or modified performance discharge test can be performed on an in-service battery in MODES 1, 2, 3, or 4 without making the battery inoperable. This test is normally performed by removing the battery from service and placing the spare vital battery in-service. Furthermore, the test is not performed in steps, where only part of the test can be performed.

Enclosure 2, Volume 13, Rev. 0, Page 453 of 638

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]~~ also implements a program specified in Specification 5.5.~~17~~ for monitoring various battery parameters.

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 ~~[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. 2).~~

The DG battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. Each DG battery consists of 58 cells; however, a battery is considered OPERABLE with 57 cells if one is strapped out. Optimal long term performance is obtained by maintaining a float voltage of 2.20 to 2.25 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self-discharge.

The initial conditions of Design Basis Accident (DBA) and transient analyses in the 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.

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]~~ is conducted as specified in Specification 5.5.~~17~~.

Battery Monitoring and Maintenance Program

2 3

15

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

A.1, A.2, and A.3

With one or more cells in one 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.

5 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

vital

or one or more DG batteries with float current > 1 amp

One 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

1 5 2

BASES

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) (5) .1 or B.2.2

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 "OR" 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 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) (2) (5) .1 or B.2.2

~~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).~~ (6)

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 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. 5

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.~~17~~15, 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.~~17~~15.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 3 2

D.1

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. 5

BASES

ACTIONS (continued)

E.1

With one or more batteries in redundant ~~subsystems~~ trains 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 not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one ~~subsystem~~ train within 2 hours.

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, 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 vital 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.~~

INSERT 1

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~~

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

VKG022

The minimum required procedural time to measure battery float current will be 30 seconds or as recommended by the float current measurement instrument manufacturer. The minimum float current measurement time is required to provide a more accurate battery float current reading.

5 **INSERT 1**

Similarly, discovering one or more DG batteries with one or more battery cells float voltage less than 2.07 V and float current greater than 1 amp indicates that the battery capacity may not be sufficient to perform the intended functions. The associated vital or DG battery must therefore be declared inoperable. In addition, if SR 3.8.6.6 or SR 3.8.6.7 are not met, the associated vital or DG battery is declared inoperable.

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.~~

~~]~~ 6

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

129 V for vital batteries and 124 V for DG batteries

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 ~~[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.~~17~~. 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. 1 2 2 3 2 15

~~[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).~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

~~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.~~

~~]~~ 6

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 31 days is consistent with IEEE-450 (Ref. 1).

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

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.
] 6

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]°F). 60 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

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

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.
] 6

INSERT 2 8

8 **INSERT 2**

SR 3.8.6.5

See SR 3.8.6.2 Bases.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.6 and SR 3.8.6.7 (8)

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. INSERT 3 (2) (1)

~~[The Surveillance Frequency for this test is normally 60 months.~~ (7)

(1) **INSERT 3**

The minimum battery capacity for the vital batteries has been raised from 80% to 82% to allow for possible discharge during the 5-minute delay associated with the Diesel Generator Start and Load Shed Timer.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

~~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.~~

~~]~~ 6

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. These Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1). 2

3.8.6.6

~~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. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR. 5 5

INSERT 4 9

9 **INSERT 4**

SR 3.8.6.7 is modified by a Note stating that credit may be taken for unplanned events that satisfy this SR.

BASES

REFERENCES

1. IEEE-450-2002
2. FSAR, Chapter 8.
3. FSAR, Chapter ~~[~~6~~]~~.
4. FSAR, Chapter ~~[~~15~~]~~.
5. IEEE-485-~~[~~1983~~]~~, June 1983.

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]~~ also implements a program specified in Specification 5.5.~~17~~ for monitoring various battery parameters.

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 ~~[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. 2).~~

VKG023

The DG battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. Each DG battery consists of 58 cells; however, a battery is considered OPERABLE with 57 cells if one is strapped out. Optimal long term performance is obtained by maintaining a float voltage of 2.20 to 2.25 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self-discharge.

The initial conditions of Design Basis Accident (DBA) and transient analyses in the 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.

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]~~ is conducted as specified in Specification 5.5.~~17~~.

Battery Monitoring and Maintenance Program

2 3

15

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

A.1, A.2, and A.3

With one or more cells in one 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.

5 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

vital

or one or more DG batteries with float current > 1 amp

One 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

1 5 2

BASES

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.

.1 or B.2.2

2 5

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 "OR" 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 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

2 5

.1 or B.2.2

~~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).~~

6

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 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. 5

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.~~17~~15, 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.~~17~~15.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 3 2

D.1

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. 5

BASES

ACTIONS (continued)

E.1

With one or more batteries in redundant ~~subsystems~~ trains 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 not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one ~~subsystem~~ train within 2 hours. 1 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, 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 vital 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.~~ 5 2 5

INSERT 1

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).~~ VKG022

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

The minimum required procedural time to measure battery float current will be 30 seconds or as recommended by the float current measurement instrument manufacturer. The minimum float current measurement time is required to provide a more accurate battery float current reading.

5 **INSERT 1**

Similarly, discovering one or more DG batteries with one or more battery cells float voltage less than 2.07 V and float current greater than 1 amp indicates that the battery capacity may not be sufficient to perform the intended functions. The associated vital or DG battery must therefore be declared inoperable. In addition, if SR 3.8.6.6 or SR 3.8.6.7 are not met, the associated vital or DG battery is declared inoperable.

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.~~

~~]~~ 6

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

129 V for vital batteries and 124 V for DG batteries

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 ~~[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.~~17~~. 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).~~

15 1 2 2 3 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

~~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.~~

~~]~~ 6

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 31 days is consistent with IEEE-450 (Ref. 1).~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

~~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.~~
~~]~~ 6

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]~~°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).~~ 60 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

~~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.~~
~~]~~ 6

INSERT 2 8

8 **INSERT 2**

SR 3.8.6.5

See SR 3.8.6.2 Bases.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.6 and SR 3.8.6.7 (8)

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. INSERT 3 (2) (1)

~~[The Surveillance Frequency for this test is normally 60 months.~~ (7)

(1) **INSERT 3**

The minimum battery capacity for the vital batteries has been raised from 80% to 82% to allow for possible discharge during the 5-minute delay associated with the Diesel Generator Start and Load Shed Timer.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 7

~~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.~~

~~]~~ 6

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. These Frequencies are consistent with the recommendations in IEEE-450 (Ref. 1). 2

3.8.6.6

~~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. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR. 5 5

INSERT 4 9

9 **INSERT 4**

SR 3.8.6.7 is modified by a Note stating that credit may be taken for unplanned events that satisfy this SR.

BASES

REFERENCES

1. IEEE-450-2002
2. FSAR, Chapter 8.
3. FSAR, Chapter ~~[~~6~~]~~.
4. FSAR, Chapter ~~[~~15~~]~~.
5. IEEE-485-~~[~~1983~~]~~, June 1983.

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 Westinghouse 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. Changes have been made to reflect changes made to the Specification.

6. 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.

7. ISTS SR 3.8.6.1, ISTS SR 3.8.6.2, ISTS SR 3.8.6.3, ISTS SR 3.8.6.4, ISTS SR 3.8.6.5, and ISTS 3.8.6.6 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.6.1, ITS SR 3.8.6.2, ITS SR 3.8.6.3, ITS SR 3.8.6.4, ITS SR 3.8.6.5, and ITS 3.8.6.6 is "In accordance with the Surveillance Frequency Control Program."

8. Editorial changes made for enhanced clarity or reflecting specification changes.

9. ITS SR 3.8.6.7 requires performance testing or modified performance testing of the DG batteries. Because this testing would not perturb the electrical distribution system as testing the vital batteries, the MODE restrictions are not applied, but the Note allowing unplanned events to be credited as satisfying this SR is included.

Enclosure 2, Volume 13, Rev. 0, Page 483 of 638

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.

Enclosure 2, Volume 13, Rev. 0, Page 485 of 638

ATTACHMENT 7

ITS 3.8.7, INVERTERS - OPERATING

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

ITS

A01

ITS 3.8.7

ELECTRICAL POWER SYSTEMS

3/4.8.2 ONSITE POWER DISTRIBUTION SYSTEMS

A.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

A01

inverters

See ITS 3.8.9

3.8.2.1 The following A.C. electrical boards shall be OPERABLE and energized with tie breakers open between redundant boards:

6900	Volt Shutdown Board	1A-A
6900	Volt Shutdown Board	1B-B
6900	Volt Shutdown Board	2A-A
6900	Volt Shutdown Board	2B-B
480	Volt Shutdown Board	1A1-A
480	Volt Shutdown Board	1A2-A
480	Volt Shutdown Board	1B1-B
480	Volt Shutdown Board	1B2-B
480	Volt Shutdown Board	2A1-A
480	Volt Shutdown Board	2A2-A
480	Volt Shutdown Board	2B1-B
480	Volt Shutdown Board	2B2-B

See ITS 3.8.9

See ITS 3.8.9

LCO 3.8.7

120 Volt A.C. Vital Instrument Power Board Channels 1-I and 2-I energized from ~~inverters 1-I and 2-I connected to D.C. Channel I~~*#@.

120 Volt A.C. Vital Instrument Power Board Channels 1-II and 2-II energized from ~~inverters 1-II and 2-II connected to D.C. Channel II~~*#@.

120 Volt A.C. Vital Instrument Power Board Channels 1-III and 2-III energized from ~~inverters 1-III and 2-III connected to D.C. Channel III~~*#@.

120 Volt A.C. Vital Instrument Power Board Channels 1-IV and 2-IV energized from ~~inverters 1-IV and 2-IV connected to D.C. Channel IV~~*#@.

LA01

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

See ITS 3.8.9

REQUIRED ACTION A.1 NOTE

a. With less than the above complement of A.C. boards OPERABLE and energized, restore the inoperable boards 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.

ACTION A

ACTION B

b. With one inverter inoperable, energize the associated Vital Instrument Power Board within 8 hours; restore the inoperable inverter to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

See ITS 3.8.9

SR 3.8.7.1

4.8.2.1 The specified A.C. boards and inverters shall be determined OPERABLE and energized with tie breakers open between redundant boards ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the busses.

inverter voltage, frequency, and

In accordance with the Surveillance Frequency Control Program

M01

LA02

LCO 3.8.7 NOTE

* Two inverters may be disconnected from their D.C. source for up to 24 hours for the purpose of performing an equalizing charge on their associated battery bank provided (1) the vital instrument power board is OPERABLE and energized, and (2) the vital instrument power boards associated with the other battery banks are OPERABLE and energized from their respective inverters connected to their respective D.C. source.

M02

from inverter using internal AC source

\# D.C. Channel V may be substituted for any one channel of channels I-IV.

See ITS 3.8.9

@ ~~The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.~~

LA01

ITS

A01

ITS 3.8.7

ELECTRICAL POWER SYSTEMS

3/4.8.2 ONSITE POWER DISTRIBUTION SYSTEMS

A.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

LCO 3.8.7

3.8.2.1 The following A.C. electrical boards and inverters shall be OPERABLE and energized with tie breakers open between redundant boards:

See ITS 3.8.9

6900	Volt Shutdown Board 1A-A
6900	Volt Shutdown Board 1B-B
6900	Volt Shutdown Board 2A-A
6900	Volt Shutdown Board 2B-B
480	Volt Shutdown Board 1A1-A
480	Volt Shutdown Board 1A2-A
480	Volt Shutdown Board 1B1-B
480	Volt Shutdown Board 1B2-B
480	Volt Shutdown Board 2A1-A
480	Volt Shutdown Board 2A2-A
480	Volt Shutdown Board 2B1-B
480	Volt Shutdown Board 2B2-B

See ITS 3.8.9

See ITS 3.8.9

120	Volt A.C. Vital Instrument Power Board Channels 1-I and 2-I energized from ~~inverters 1-I and 2-I connected to D.C. Channel I~~*#@.
120	Volt A.C. Vital Instrument Power Board Channels 1-II and 2-II energized from ~~inverter 1-II and 2-II connected to D.C. Channel II~~*#@.
120	Volt A.C. Vital Instrument Power Board Channels I-III and 2-III energized from ~~inverter 1-III and 2-III connected to D.C. Channel III~~*#@.
120	Volt A.C. Vital Instrument Power Board Channels I-IV and 2-IV energized from ~~inverter 1-IV and 2-IV connected to D.C. Channel IV~~*#@.

LA01

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

REQUIRED ACTION A.1 NOTE

a. With less than the above complement of A.C. boards OPERABLE and energized, restore the inoperable boards 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.

See ITS 3.8.9

ACTION A

ACTION B

b. With one inverter inoperable, energize the associated Vital Instrument Power Board within 8 hours; restore the inoperable inverter to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

See ITS 3.8.9

SR 3.8.7.1

4.8.2.1 The specified A.C. boards and inverters shall be determined OPERABLE and energized with tie breakers open between redundant boards ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the busses.

inverter voltage, frequency, and

M01

In accordance with the Surveillance Frequency Control Program

LA02

LCO 3.8.7 NOTE

* Two inverters may be disconnected from their D.C. source for up to 24 hours for the purpose of performing an equalizing charge on their associated battery bank provided (1) the vital instrument power board is OPERABLE and energized, and (2) the vital instrument power boards associated with the other battery banks are OPERABLE and energized from their respective inverters connected to their respective D.C. sources.

M02

from inverter using internal AC source

\# D.C. Channel V may be substituted for any one channel of channels I - IV.

See ITS 3.8.9

@ ~~The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.~~

LA01

DISCUSSION OF CHANGES
ITS 3.8.7, INVERTERS - OPERATING

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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-1431, Rev. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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 CTS 4.8.2.1 requires, in part, the specified inverters to 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 the 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 vital bus when powered by the associated inverter. This change is acceptable because the Surveillance will continue to verify OPERABILITY of the required inverters. Proper voltage and frequency is supplied to the instrumentation channels that provide inputs to the Reactor Trip 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.

M02 CTS 3.8.2.1 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. One of the provisions is that the vital instrument power board is OPERABLE and energized. ITS 3.8.7 Note provides a similar allowance, and specifies that the affected vital instrument power board is powered from the inverter connected to its internal AC source. 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 internal AC source.

The purpose of CTS 3.8.2.1 is to ensure stable and reliable AC electrical power for the system instrumentation required for a safe reactor shut down. CTS 3.8.2.1 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 vital instrument board to be energized from its respective inverter powered from the internal AC source ensures the vital instrument board continues to be powered from a stable power source to minimize perturbations on the vital instrumentation board. This change

Enclosure 2, Volume 13, Rev. 0, Page 490 of 638

DISCUSSION OF CHANGES
ITS 3.8.7, INVERTERS - OPERATING

is designated as more restrictive because ITS requires the vital instrumentation boards associated with a inverters disconnected from their DC source during an equalizing charge on the associated battery bank to be energized from a specific source of power.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.2.1 states, in part, inverters 1-I and 2-I connected to D.C. Channel I, inverters 1-II and 2-II connected to D.C. Channel II, inverters 1-III and 2-III connected to D.C. Channel III, and inverters 1-IV and 2-IV connected to D.C. Channel IV. CTS 3.8.2.1 Note @ states, in part, the spare inverter for a specified channel may be substituted for one of the two inverters of the same channel. ITS 3.8.7 does not contain this level of detail information. This changes the CTS by moving the level of detail of inverter designators and alignment to the DC channel and details that spare inverter may be substituted for one of the two inverters of the same channel 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 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 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.8.2.1 requires, in part, verification of the correct breaker alignment for the inverters at least once per 7 days. ITS SR 3.8.7.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequency for the SR to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain

Enclosure 2, Volume 13, Rev. 0, Page 491 of 638

DISCUSSION OF CHANGES
ITS 3.8.7, INVERTERS - OPERATING

in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

Enclosure 2, Volume 13, Rev. 0, Page 492 of 638

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

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

3.8.2.1 LCO 3.8.7 The required Train A and Train B inverters shall be OPERABLE.

VKG024

T

----------NOTE----------

source

[[One/two] 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:

instrument power board

3.8.2.1 Note * a. The associated AC vital bus(es) [is/are] energized from [its/their] [Class 1E constant voltage source transformers] [inverter using internal AC source], and

instrument power boards

b. All other AC vital buses are energized from their associated OPERABLE inverters.]

connected to their DC source

----

2 1

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION b A. One [required] inverter inoperable.	A.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating" with any AC vital bus de-energized. ---------- instrument power board Restore inverter to OPERABLE status.	2 1 24 hours
ACTION b B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND	6 hours

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.8.2.1	SR 3.8.7.1	Verify correct inverter voltage, ~~[~~frequency~~]~~, and alignment to required AC vital ~~buses~~. instrument power boards	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	1 2 3 VKG024

Enclosure 2, Volume 13, Rev.1, Page 495 of 638

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

3.8.2.1 LCO 3.8.7 The required Train A and Train B inverters shall be OPERABLE.

T

----------NOTE----------

3.8.2.1 Note * [[~~One/~~two~~]~~ 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:

source

instrument power board

a. The associated AC vital ~~bus~~(es) [~~is/~~are~~]~~ energized from [~~its/~~their~~]~~ ~~[Class 1E constant voltage source transformers]~~ [inverter using internal AC source~~]~~, and

instrument power boards

b. All other AC vital ~~buses~~ are energized from their associated OPERABLE inverters. ~~]~~

connected to their DC source

VKG024

2 1

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION b A. One [~~required~~] inverter inoperable.	A.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating" with any AC vital ~~bus~~ de-energized. ---------- instrument power board Restore inverter to OPERABLE status.	2 1 24 hours
ACTION b B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND	6 hours

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.8.2.1	SR 3.8.7.1	Verify correct inverter voltage, ~~[~~frequency~~]~~, and alignment to required AC vital ~~buses~~. instrument power boards	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	1, 2, 3, VKG024

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.7, 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 Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. ISTS SR 3.8.7.1 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.7.1 is "In accordance with the Surveillance Frequency Control Program."

Enclosure 2, Volume 13, Rev. 0, Page 498 of 638

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

VKG024 instrument power boards

BASES

BACKGROUND

The inverters are the preferred source of power for the AC vital ~~buses~~ because of the stability and reliability they achieve. INSERT 1 The function of the inverter is to provide AC electrical power to the vital ~~buses~~. The inverters can be powered from an internal AC source/rectifier or from the station battery. The station batter~~y~~ 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 FSAR, Chapter ~~[~~8~~]~~ (Ref. 1).

instrument power boards

ies

U

1 1 1 1 1 2

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, 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.

U

1 2

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 AC vital ~~buses~~ OPERABLE during accident conditions in the event of:

instrument power boards

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 distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The inverters ensure the availability of 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

INSERT 1

instrument power boards

There are two unit inverters and one spare inverter per channel, each capable of supplying its associated AC vital ~~buses~~, making a total of twelve inverters. Inverters 1-I and 2-I are connected to DC Channel I, inverters 1-II and 2-II are connected to DC Channel II, inverters 1-III and 2-III are connected to DC Channel III, and inverters 1-IV and 2-IV are connected to DC Channel IV. The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.

VKG024

BASES

LCO (continued)

eight inverters (two per channel)

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 AC electrical power to the AC vital ~~buses~~ even if the ~~4.16 kV~~ safety ~~buses~~ are de-energized.

VKG024

instrument power boards

480 volt

boards

board

OPERABLE inverters require the associated 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.

instrument power board

n

the remaining required

This LCO is modified by a Note that allows ~~[one/~~two~]~~ inverters to be disconnected from a ~~[~~common~]~~ battery for ≤ 24 hours, if the vital ~~bus~~(es) is powered from a ~~[Class 1E constant voltage transformer or~~ inverter using internal AC source~]~~ during the period and ~~all other~~ inverters are operable. This allows an equalizing charge to be placed on one battery. If the inverters 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 vital ~~bus~~ while taking into consideration the time required to perform an equalizing charge on the battery bank.

instrument power board

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.

remaining required

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

instrument power board

VKG024

With a required inverter inoperable, its associated AC vital ~~bus~~ becomes inoperable until it is ~~[~~manually~~]~~ re-energized from its ~~[Class 1E constant voltage source transformer or~~ inverter using internal AC source~~]~~.

For this reason a Note has been included in Condition A requiring the entry into the Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating." This ensures that the vital ~~bus~~ is re-energized within ~~2~~ hours.

board

8

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. 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 ~~bus~~ is powered from its constant voltage source, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the AC vital ~~buses~~ is the preferred source for powering instrumentation trip setpoint devices.

instrument power board

instrument power board

B.1 and B.2

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 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 plant 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 ~~buses~~ energized from the 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 ~~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.~~

instrument power boards

instrument power boards

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ 4

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

REFERENCES U

1. FSAR, Chapter ~~[~~8~~]~~.
2. FSAR, Chapter ~~[~~6~~]~~.
3. FSAR, Chapter ~~[~~15~~]~~.

1 2

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.7 Inverters - Operating

VKG024

BASES

BACKGROUND

The inverters are the preferred source of power for the AC vital ~~buses~~ instrument power boards because of the stability and reliability they achieve. The function of the inverter is to provide AC electrical power to the vital ~~buses~~ instrument power boards. The inverters can be powered from an internal AC source/rectifier or from the station batter~~y~~ies. The station batter~~y~~ies 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 FSAR, Chapter ~~[~~8~~]~~ (Ref. 1).

INSERT 1

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, 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.

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 AC vital ~~buses~~ instrument power boards OPERABLE during accident conditions in the event of:

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 distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The inverters ensure the availability of 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

INSERT 1

instrument power boards

VKG024

There are two unit inverters and one spare inverter per channel, each capable of supplying its associated AC vital ~~buses~~, making a total of twelve inverters. Inverters 1-I and 2-I are connected to DC Channel I, inverters 1-II and 2-II are connected to DC Channel II, inverters 1-III and 2-III are connected to DC Channel III, and inverters 1-IV and 2-IV are connected to DC Channel IV. The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.

BASES

LCO (continued)

eight inverters (two per channel)

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 AC electrical power to the AC vital ~~buses~~ even if the ~~4.16 kV~~ safety ~~buses~~ are de-energized.

VKG024

instrument power boards

480 volt

boards

board

OPERABLE inverters require the associated 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.

instrument power board

n

the remaining required

This LCO is modified by a Note that allows ~~[one/~~two~]~~ inverters to be disconnected from a ~~[~~common~]~~ battery for ≤ 24 hours, if the vital ~~bus~~(es) is powered from a ~~[Class 1E constant voltage transformer or~~ inverter using internal AC source~]~~ during the period and ~~all other~~ inverters are operable. This allows an equalizing charge to be placed on one battery. If the inverters 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 vital ~~bus~~ while taking into consideration the time required to perform an equalizing charge on the battery bank.

instrument power board

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.

remaining required

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

instrument power board

VKG024

With a required inverter inoperable, its associated AC vital ~~bus~~ becomes inoperable until it is ~~[~~manually~~]~~ re-energized from its ~~[Class 1E constant voltage source transformer or~~ inverter using internal AC source~~]~~.

1

2

For this reason a Note has been included in Condition A requiring the entry into the Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating." This ensures that the vital ~~bus~~ is re-energized within ~~2~~ hours.

1

1

instrument power board

8

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. 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 ~~bus~~ is powered from its constant voltage source, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the AC vital ~~buses~~ is the preferred source for powering instrumentation trip setpoint devices.

instrument power board

1

instrument power boards

1

B.1 and B.2

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 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 plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

instrument power boards

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 of the RPS and ESFAS 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

instrument power boards

1

4

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ 4

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

REFERENCES U

1. FSAR, Chapter ~~[~~8~~]~~.
2. FSAR, Chapter ~~[~~6~~]~~.
3. FSAR, Chapter ~~[~~15~~]~~.

1 2

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 Westinghouse 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. ISTS SR 3.8.7.1 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.7.1 is "In accordance with the Surveillance Frequency Control Program.

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.

Enclosure 2, Volume 13, Rev. 0, Page 510 of 638

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.

Enclosure 2, Volume 13, Rev. 0, Page 512 of 638

ATTACHMENT 8

ITS 3.8.8, INVERTERS - SHUTDOWN

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

ITS

A01

ELECTRICAL POWER SYSTEMS

A.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

to support one train of the 120 V AC vital board electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

A02

LCO 3.8.8

3.8.2.2 As a minimum, the following A.C. electrical boards and inverters shall be OPERABLE and energized:

See ITS 3.8.10

2 - 6900 volt shutdown boards, either 1A-A and 2A-A or 1B-B and 2B-B,

4 - 480 volt shutdown boards associated with the required OPERABLE 6900 volt shutdown boards,

See ITS 3.8.10

See ITS 3.8.10

LCO 3.8.8

2 - 120 volt A.C. vital instrument power boards either Channels I and III or Channels II and IV energized from their respective inverters# ~~connected to their respective D.C. battery banks*~~, ~~and 480 volt shutdown boards~~.

LA03

LA02

L01

Applicability

APPLICABILITY: MODES 5 and 6.

M01

, During movement of irradiated fuel assemblies.

ACTION:

Add ACTIONS Note

With less than the above complement of A.C. boards and inverters OPERABLE and energized, ~~establish CONTAINMENT INTEGRITY within 8 hours.~~

See ITS 3.8.10

Add proposed Required Actions A.1, A.2, and A.3

L02

SURVEILLANCE REQUIREMENTS

See ITS 3.8.10

SR 3.8.8.1

4.8.2.2 The specified A.C. boards and inverters shall be determined OPERABLE and energized ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the bus.

inverter voltage, frequency, and

M02

in accordance with the Surveillance Frequency Control Program

LA01

~~* Any one of the inverters may be connected to D.C. Battery Bank V.~~

~~# The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.~~

LA02

A01

ECTRICAL POWER SYSTEMS

A.C. DISTRIBUTION - SHUTDOWN

to support one train of the 120 V AC vital board electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

A02

LIMITING CONDITION FOR OPERATION

LCO 3.8.8

3.8.2.2 As a minimum, the following A.C. electrical boards and inverters shall be OPERABLE and energized:

See ITS 3.8.10

2 - 6900 volt shutdown boards, either 1A-A and 2A-A or 1B-B and 2B-B,

4 - 480 volt shutdown boards associated with the required OPERABLE 6900 volt shutdown boards,

See ITS 3.8.10

LCO 3.8.8

2 - 120 volt A.C. vital instrument power boards either Channels I and III or Channels II and IV energized from their respective inverters~~# connected to their respective D.C. battery banks,* and 480 volt shut-down boards~~.

See ITS 3.8.10

LA03

LA02

L01

Applicability

APPLICABILITY: MODES 5 and 6~~.~~

, During movement of irradiated fuel assemblies.

M01

ACTION:

Add ACTIONS Note

With less than the above complement of A.C. boards and inverters OPERABLE and energized,~~ establish CONTAINMENT INTEGRITY within 8 hours.~~

See ITS 3.8.10

Add proposed Required Actions A.1, A.2, and A.3

L02

SR 3.8.8.1

SURVEILLANCE REQUIREMENTS

See ITS 3.8.10

4.8.2.2 The specified A.C. boards and inverters shall be determined OPERABLE and energized ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the bus.

inverter voltage, frequency, and

M02

in accordance with the Surveillance Frequency Control Program

LA01

~~* Any one of the inverters may be connected to D.C. Battery Bank V.~~

~~# The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.~~

LA02

Enclosure 2, Volume 13, Rev. 0, Page 516 of 638

DISCUSSION OF CHANGES
ITS 3.8.8, INVERTERS - SHUTDOWN

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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-1431, Rev. 4.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.8.2.2 requires, in part, two OPERABLE 120 V AC vital instrument boards (either Channels I and III or Channels II and IV) energized from their respective inverters connected to their respective DC battery banks and 480 V shutdown boards. (See DOC L01 for the discussion related to deleting the requirement for the inverters to be connected to 480 V shutdown boards. See DOC LA03 for the discussion related to moving the requirement for the inverters to be connected to their respective DC battery bank.) ITS 3.8.8 requires two inverters to be OPERABLE to support one train of the 120 V AC vital electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown." This changes the CTS by providing a specific LCO for inverters.

The purpose of CTS 3.8.2.2 is to 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 change is acceptable because ITS 3.8.8 maintains this purpose for the part associated with the inverters. No changes are made to CTS inverter requirements. The change is in format from CTS to ITS and maintains the inverters technical requirements. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.8.2.2 is applicable in MODES 5 and 6. ITS LCO 3.8.8 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 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 the appropriate ACTIONS are taken (i.e. stop fuel movement) when the minimum

Enclosure 2, Volume 13, Rev. 0, Page 517 of 638

electrical supply is not available. (See DOC L02 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 3.8.8 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, not only in MODES 5 and 6.

M02 CTS 4.8.2.2 requires, in part, verification that the specified inverters are OPERABLE every 7 days by verifying correct breaker alignment. ITS SR 3.8.8.1 requires the verification of correct inverter voltage, frequency, and alignments to required AC vital boards. This changes the CTS by requiring the specific verification of the inverter voltage and frequency every 7 days.

The purpose of CTS 4.8.2.2 is to ensure the instrumentation channels are provided with the proper voltage and frequency when powered by the associated inverter. This change is acceptable because the Surveillance will continue to verify OPERABILITY of the required inverters by verifying proper voltage and frequency are supplied to the instrumentation channels that provide inputs to the Reactor Trip System and Engineered Safety Features Actuation System. This change is designated as more restrictive because the ITS requires verification of the correct inverter voltage and frequency, where the CTS does not provide explicit requirements for the inverter.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.8.2.2 requires, in part, the specified inverters shall be determined OPERABLE once per seven days by verifying correct breaker alignment. ITS SR 3.8.8.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequency for this SR and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance

DISCUSSION OF CHANGES
ITS 3.8.8, INVERTERS - SHUTDOWN

Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.2.2 footnote # states, the spare inverter for the specified channel may be substituted for one of the two inverters of the same channel and CTS 3.8.2.2 footnote * states, any one of the inverters may be connected to the D.C. Battery Bank V. ITS 3.8.8 requires, in part, the inverters to be OPERABLE to support the onsite class 1E AC vital board electrical power distribution subsystem(s) required by LCO 3.8.10. This changes the CTS by moving this level of detail information into the ITS Bases. Note that ITS 3.8.8 Bases refers to the Bases for LCO 3.8.7, "Inverters – Operating," where this level of detail is located.

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 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.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.2.2 states, in part, two 120 volt A.C. vital instrument power boards either Channel I and III or Channels II and IV energized from their respective inverters connected to their respective D.C. battery banks. ITS 3.8.8, LCO states that two inverters shall be OPERABLE to support one train of the 120 V AC vital board electrical power distribution subsystem required by LCO 3.8.10, "Distribution Systems – Shutdown." This changes the CTS by moving this level of detail information into 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 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

Enclosure 2, Volume 13, Rev. 0, Page 519 of 638

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 1 – Relaxation of LCO Requirements)* CTS 3.8.2.2 requires, in part, two OPERABLE inverters that are connected to their respective DC battery banks and 480 volt shutdown boards in MODES 5 and 6. ITS 3.8.8 requires two OPERABLE inverters in MODES 5 and 6 and during the movement of irradiated fuel assemblies. (See DOC LA03 for the discussion related to moving the details regarding the inverters being connected to their respective DC battery banks. See DOC M01 for the discussion related to changes in the Applicability.) This changes the CTS by deleting the requirement that the inverters be connected to the 480 volt shutdown boards.

The purpose of CTS 3.8.2.2 is to ensure the availability of vital AC electrical power for the instrumentation associated with systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. This change is acceptable because the LCO requirements continue to ensure that the structures, systems, and components are maintained consistent with the safety analyses and licensing basis. CTS 3.8.2.1 provides the requirements for the 120 V AC vital boards and associated inverters in MODES 1, 2, 3 and 4 and specifies that an OPERABLE inverter is connected to its respective DC channel. Furthermore, CTS 3.8.2.1 Note * specifies that two inverters may be disconnected from their DC source for up to 24 hours for the performance of an equalizing charge on the associated battery bank provided the instrument power board is OPERABLE and energized, and the vital instrument power boards associated with the other battery banks are OPERABLE and energized from their respective inverters connected to their respective DC source. There are no special operations associated with MODES 5 and 6 that would require 480 V AC power to be connected to the required inverters to ensure their OPERABILITY. The requirements of ITS 3.8.5 will continue to require one train of vital DC electrical power to be OPERABLE to support the required subsystems of the distribution systems required to be OPERABLE by ITS 3.8.10, "Distribution Systems – Shutdown," in MODES 5 and 6 and during the movement of irradiated fuel assemblies. Therefore, the inverter required power source, as specified for operation in MODES 1, 2, 3 and 4, will be reflected as the required power source for inverter OPERABILITY in MODES 5 and 6 and during the movement of irradiated fuel assemblies. This change is designated as less restrictive because less stringent requirements are being applied in ITS than were applied in CTS.

L02 *(Category 4 – Relaxation of Required Action)* With less than the minimum required inverters OPERABLE, CTS 3.8.2.2 Action requires the establishment of containment integrity within 8 hours. ITS 3.8.8 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 actions to restore required inverters to OPERABLE status. This changes the CTS by replacing the existing Required

DISCUSSION OF CHANGES
ITS 3.8.8, INVERTERS - SHUTDOWN

Action to restore containment integrity with Actions that will minimize the probability of occurrence of postulated events.

The purpose of the CTS 3.8.2.2 Action is to isolate the containment to minimize any release from the plant if an event were to occur during shutdown conditions with no inverters 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 purposed Required Actions require the suspension of movement of irradiated fuel assemblies, suspension of operations involving a positive reactivity additions that could result in the loss of required SDM or boron concentration, and the initiation of actions to restore required inverter(s) 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 actions to restore the required inverter(s) to OPERABLE status will ensure the plant is placed in compliance with the LCO in an expeditious manner. The proposed actions will immediately 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 action to restore containment integrity has 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.

Enclosure 2, Volume 13, Rev. 0, Page 521 of 638

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

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters - Shutdown

VKG024

instrument power

3.8.2.2 LCO 3.8.8

~~[Inverters 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."]~~

Two

~~[One]~~ inverter~~[s]~~ shall be OPERABLE~~.]~~ to support one train of the 120 V AC vital board electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

1

~~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.~~

2

Applicability
DOC M01

APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies.

1

ACTIONS

---NOTE---

DOC M01 LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M03 A. One ~~[~~or more~~]~~ ~~[~~required~~]~~ inverter~~[s]~~ inoperable.	~~A.1 Declare affected required feature(s) inoperable.~~	~~Immediately~~
	~~OR~~	
DOC L02	~~A.2.1~~ Suspend movement of ~~[recently]~~ irradiated fuel assemblies. (A.1)	Immediately
	← AND	

3

1

3

SEQUOYAH UNIT 1

Amendment XXX

4

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L02	~~A.2.2~~ A.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately (3)
	AND	
	~~A.2.3~~ A.3 Initiate action to restore required inverters to OPERABLE status.	Immediately (3)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
4.8.2.2 DOC M02 SR 3.8.8.1	Verify correct inverter voltage, ~~[~~frequency,~~]~~ and alignments to required AC vital ~~buses~~ boards. instrument power boards VKG024	~~[7 days~~ (1) (2) ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (5)

Enclosure 2, Volume 13, Rev. 1, Page 524 of 638

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters - Shutdown

VKG024

instrument power

3.8.2.2 LCO 3.8.8 ~~[Inverters 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."]~~

Two

~~[One]~~ inverter~~[s]~~ shall be OPERABLE~~.]~~ to support one train of the 120 V AC vital board electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

1

~~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.~~

2

Applicability
DOC M01

APPLICABILITY: MODES 5 and 6,
During movement of ~~[recently]~~ irradiated fuel assemblies.

1

ACTIONS

---NOTE---

DOC M01 LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M03 A. One ~~[~~or more~~]~~ ~~[~~required~~]~~ inverter~~[s]~~ inoperable.	~~A.1 Declare affected required feature(s) inoperable.~~	~~Immediately~~
	~~OR~~	
DOC L02	~~A.2.1~~ Suspend movement of ~~[recently]~~ irradiated fuel assemblies. (A.1)	Immediately
	AND	

3

1

3

SEQUOYAH UNIT 2

Amendment XXX

4

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L02	~~A.2.2~~ A.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately (3)
	AND	
	~~A.2.3~~ A.3 Initiate action to restore required inverters to OPERABLE status.	Immediately (3)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
4.8.2.2 DOC M02 SR 3.8.8.1	Verify correct inverter voltage, ~~[~~frequency,~~]~~ and alignments to required AC vital ~~buses~~ boards instrument power boards. VKG024	~~[7 days~~ (1) (2) ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (5)

Enclosure 2, Volume 13, Rev. 1, Page 526 of 638

JUSTIFICATION FOR DEVIATIONS
ITS 3.8.8, INVERTERS - SHUTDOWN

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

2. 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.

3. ISTS 3.8.8 Required Action A.1 provides an option to declare affected required feature(s) inoperable with one or more required inverters inoperable. The ISTS Bases states this is acceptable because the remaining inverters may be capable of supporting sufficient features to allow continued fuel movement. This option has been deleted since only one train of inverters is required to be OPERABLE in MODES 5 and 6, and during the movement of irradiated fuel assemblies. Subsequent Required Actions have been renumbered and modified, as applicable.

4. 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.

5. ISTS SR 3.8.8.1 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.8.1 is "In accordance with the Surveillance Frequency Control Program."

Enclosure 2, Volume 13, Rev. 0, Page 527 of 638

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 FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 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 inverters to each AC vital ~~bus~~ board during MODES 5 and 6 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 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 AC and DC 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).]~~.

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 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

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 distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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 vital ~~bus[es]~~ even if the ~~4.16 kV safety buses~~ are de-energized. OPERABILITY of the inverter~~[s]~~ requires that ~~the AC 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]~~).

an
480 volt shutdown boards
boards
an
each required vital board is
1
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:

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.

A.1, A.2 and A.3 → ~~A.1, A.2.1, A.2.2, and A.2.3~~

~~[If two trains 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, and operations with a potential for positive reactivity additions.] 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]~~ 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 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.

INSERT 1 →

2

1

2

1 **INSERT 1**

With one or more required inverters inoperable, the minimum required vital AC electrical power source is not available.

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 constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with boards (1) 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 boards (1) 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.~~ (3)

~~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)

REFERENCES

1. (U) FSAR, Chapter [6]. (1) (2)
2. (U) FSAR, Chapter [15].

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 FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 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 inverters to each AC vital ~~bus~~ board during MODES 5 and 6 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 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 AC and DC 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).]~~.

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 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

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 distribution system and, as such, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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 vital ~~bus[es]~~ even if the ~~4.16 kV safety buses~~ are de-energized. OPERABILITY of the inverter~~[~~s~~]~~ requires that ~~the AC 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]~~).

an
480 volt shutdown boards
boards
each required vital board is
an
1
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:

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

SEQUOYAH UNIT 2
Amendment XXX

1

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.

A.1, A.2 and A.3 → ~~A.1, A.2.1, A.2.2, and A.2.3~~

~~[If two trains 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, and operations with a potential for positive reactivity additions.] 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]~~ 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 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.

INSERT 1 →

2

1

2

SEQUOYAH UNIT 2 ↓ Amendment XXX ↓

1 **INSERT 1**

With one or more required inverters inoperable, the minimum required vital AC electrical power source is not available.

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 constant voltage source transformer.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with boards (1) 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 boards (1) 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.~~ (3)

~~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)

REFERENCES

U 1. FSAR, Chapter [6]. (1) (2)

U 2. FSAR, Chapter [15].

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 Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. ISTS SR 3.8.8.1 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.8.1 is "In accordance with the Surveillance Frequency Control Program."

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.

Enclosure 2, Volume 13, Rev. 0, Page 539 of 638

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.

Enclosure 2, Volume 13, Rev. 0, Page 541 of 638

ATTACHMENT 9

ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

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

ITS

A01

ITS 3.8.9

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.9

L01

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

See ITS 3.8.1

b. ~~Four~~ separate and independent ~~diesel generator sets each with:~~

LA01

1. Two diesels driving a common generator
2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel, per tank

See ITS 3.8.1

3. A separate fuel storage system containing a minimum volume of 62,000 gallons of fuel,

See ITS 3.8.3

4. A separate fuel transfer pump, and

See ITS 3.8.1

5. ~~A separate 125 volt D.C. distribution panel,~~ 125-volt D.C. battery bank and associated charger.

LA01

See ITS 3.8.4

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Add proposed ACTION E

A02

a. With one offsite A.C. circuit of the above required A.C. electrical power source inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter. Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b.# With diesel generator set(s) 1A-A and/or 2A-A or 1B-B and/or 2B-B of the above required A.C. electrical power sources inoperable,* demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter, and determining OPERABLE diesel generator sets are not inoperable due to common cause failure or performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours; restore at least four diesel generator sets to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.8.1

Required actions, to verify OPERABLE diesel generator sets are not inoperable due to common cause failure or perform SR 4.8.1.1.2.a.4, shall be completed if this action is entered.

* No more than one diesel generator may be made simultaneously inoperable on a pre-planned basis for maintenance, modifications, or surveillance testing.

@ Offsite circuits utilizing USST 2A and USST 2B as the normal power sources require CSST A and CSST C to be available as the alternate power sources via automatic transfer at the associated 6.9 kV Unit Boards. (CSST B can be substituted for CSST A or CSST C.) This Note remains in effect until November 30, 2013, or until the USST modifications are implemented on Units 1 and 2, whichever occurs first.

Enclosure 2, Volume 13, Rev. 0, Page 544 of 638

ITS

A01

ITS 3.8.9

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying the diesel generator operates for at least 24 hours. During the first 2 hours to 2.25 hours of this test, the diesel generator shall be loaded between 4620 kw and 4840 kw and between 2380 kvar and 2600 kvar and during the remaining hours of this test, the diesel generator shall be loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar.

   The generator voltage and frequency shall be ≥ 6800 volts and ≥ 58.8 Hz within 10 seconds after the start signal. After energization, the steady state generator voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

   See ITS 3.8.1

4. Within 5 minutes of shutting down the diesel generator after it has operated ≥ 2 hours loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar, verify that the diesel generator starts within 10 seconds after receipt of the start signal and operates for greater than or equal to 5 minutes. After energization, the steady state voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

SR 3.8.9.1

4.8.1.1.3 The 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger for each diesel generator shall be demonstrated OPERABLE:

See ITS 3.8.4 and 3.8.6

a. At least once per 7 days by verifying:

   1. That the parameters in Table 4.8-1a meet the Category A limits.

   2. That the total battery terminal voltage is greater than or equal to 124-volts on float charge.

   See ITS 3.8.4 and 3.8.6

b. At least once per 92 days by:

   1. Verifying that the parameters in Table 4.8-1a meet the Category B limits,

   2. Verifying there is no visible corrosion at either terminals or connectors, or the cell to terminal connection resistance of these items is less than 150 x 10^{-6} ohms, and

   3. Verifying that the average electrolyte temperature of 6 connected cells is above 60°F.

c. At least once per 18 months by verifying that:

   1. The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.

   2. The battery to battery and terminal connections are clean, tight and coated with anti-corrosion material.

   3. The resistance of each cell to terminal connection is less than or equal to 150 x 10^{-6} ohms.

   See ITS 3.8.6

4.8.1.1.4 This surveillance has been deleted.

M01

Add proposed SR 3.8.9.1 with a Frequency of ~~7 days~~ In accordance with the Surveillance Frequency Control Program

LA02

December 16, 1998

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

LCO 3.8.9

3.8.2.1 The following A.C. electrical boards shall be OPERABLE and energized ~~with tie breakers open between redundant boards~~:

LA03

~~6900~~	~~Volt Shutdown Board~~	~~1A-A~~
~~6900~~	~~Volt Shutdown Board~~	~~1B-B~~
~~6900~~	~~Volt Shutdown Board~~	~~2A-A~~
~~6900~~	~~Volt Shutdown Board~~	~~2B-B~~
~~480~~	~~Volt Shutdown Board~~	~~1A1-A~~
~~480~~	~~Volt Shutdown Board~~	~~1A2-A~~
~~480~~	~~Volt Shutdown Board~~	~~1B1-B~~
~~480~~	~~Volt Shutdown Board~~	~~1B2-B~~
~~480~~	~~Volt Shutdown Board~~	~~2A1-A~~
~~480~~	~~Volt Shutdown Board~~	~~2A2-A~~
~~480~~	~~Volt Shutdown Board~~	~~2B1-B~~
~~480~~	~~Volt Shutdown Board~~	~~2B2-B~~

LA01

~~120 Volt A.C. Vital Instrument Power Board Channels 1-I and 2-I~~ energized from inverters 1-I and 2-I connected to D.C. Channel I*#@.

~~120 Volt A.C. Vital Instrument Power Board Channels 1-II and 2-II~~ energized from inverters 1-II and 2-II connected to D.C. Channel II*#@.

~~120 Volt A.C. Vital Instrument Power Board Channels 1-III and 2-III~~ energized from inverters 1-III and 2-III connected to D.C. Channel III*#@.

~~120 Volt A.C. Vital Instrument Power Board Channels 1-IV and 2-IV~~ energized from inverters 1-IV and 2-IV connected to D.C. Channel IV*#@.

See ITS 3.8.7

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

ACTION:

Add proposed Required Action A Note

A03

Add proposed ACTION E

L03

Unit 1

L01

ACTION A
ACTION B
ACTION F

G

a. With less than the above complement of A.C. boards OPERABLE and energized, restore the inoperable boards 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 D

L01

VKG025

b. With one inverter inoperable, energize the associated Vital Instrument Power Board within 8 hours; restore the inoperable inverter to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.8.7

Add proposed ACTION G

M02

H

SURVEILLANCE REQUIREMENTS

See ITS 3.8.7

SR 3.8.9.1

4.8.2.1 The specified A.C. boards and inverters shall be determined OPERABLE and energized ~~with tie breakers open between redundant boards~~ ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the busses.

LA03

In accordance with the Surveillance Frequency Control Program

* Two inverters may be disconnected from their D.C. source for up to 24 hours for the purpose of performing an equalizing charge on their associated battery bank provided (1) the vital instrument power board is OPERABLE and energized, and (2) the vital instrument power boards associated with the other battery banks are OPERABLE and energized from their respective inverters connected to their respective D.C. source.

LA02

See ITS 3.8.7

~~# D.C. Channel V may be substituted for any one channel of channels I-IV.~~

LA04

@ The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.

See ITS 3.8.7

ITS

A01

ITS 3.8.9

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTI0N - OPERATING

LIMITING CONDITION FOR OPERATION

LCO 3.8.9

3.8.2.3 The following D.C. vital battery channels shall be energized and OPERABLE:

LA01

~~CHANNEL I Consisting of 125 volt D.C. board No. I~~, 125 - volt D.C. battery bank No. I* and a full capacity charger.

~~CHANNEL II Consisting of 125 volt D.C. board No. II~~, 125 - volt D.C. battery bank No. II*, and a full capacity charger.

~~CHANNEL III Consisting of 125 volt D.C. board No. III~~, 125 - volt D.C. battery bank No. III*, and a full capacity charger.

VKG025

~~CHANNEL IV Consisting of 125 volt D.C. board No. IV~~, 125 - volt D.C. battery bank No. IV*, and a full capacity charger.

See ITS 3.8.4

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

ACTION: or more

L02

ACTION C

ACTION F

G

a. With one 125-volt D.C. board inoperable, restore the inoperable board to OPERABLE status within 2 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 125-volt D.C. battery bank and/or its charger inoperable, restore the inoperable battery bank and/or charger to OPERABLE status 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 3.8.4

*D.C. Battery Bank V may be substituted for any other Battery Bank as needed.

See ITS 3.8.4

ITS

ITS 3.8.9

A01

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

In accordance with the Surveillance Frequency Control Program — LA02

LA03

SR 3.8.9.1 4.8.2.3.1 Each D.C. bus train shall be determined OPERABLE and energized ~~with tie breakers open between redundant busses~~ ~~at least once per 7 days~~ by verifying correct breaker alignment, indicated power availability from the charger and battery, and voltage on the bus ~~of greater than or equal to 125 volts~~. — See ITS 3.8.4

LA05

4.8.2.3.2* Each 125-volt battery bank and charger shall be demonstrated OPERABLE: — See ITS 3.8.4 and 3.8.6

a. At least once per 7 days by:

1. Verifying that the parameters in Table 4.8-2 meet the Category A limits, and — See ITS 3.8.6

2. Verifying total battery terminal voltage is greater than or equal to 129-volts on float charge. — See ITS 3.8.4

b. At least once per 92 days and within 7 days after a battery discharge (battery terminal voltage below 110-volts), or battery overcharge (battery terminal voltage above 150-volts), by:

1. Verifying that the parameters in Table 4.8-2 meet the Category B limits, — See ITS 3.8.6

2. Verifying there is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150 x 10^{-6} ohms, and

3. Verifying that the average electrolyte temperature of 6 connected cells is above 60°F.

c. At least once per 18 months 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. The resistance of each cell-to-terminal connection is less than or equal to 150 x 10^{-6} ohms, and

4. The battery charger will supply at least 150 amperes at 125 volts for at least 4 hours. — See ITS 3.8.4

* This surveillance includes Battery Bank V, but not charger V. — See ITS 3.8.4

ITS

A01

ITS 3.8.9

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

Add proposed LCO 3.8.9

L01

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

See ITS 3.8.1

b. ~~Four~~ separate and independent ~~diesel generator sets each with~~:

LA01

1. Two diesels driving a common generator
2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel, per tank

See ITS 3.8.1

3. A separate fuel storage system containing a minimum volume of 62,000 gallons of fuel,

See ITS 3.8.3

4. A separate fuel transfer pump, and

See ITS 3.8.1

5. ~~A separate 125-volt D.C. distribution panel,~~ 125-volt D.C. battery bank and associated charger.

LA01

See ITS 3.8.4

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Add proposed ACTION E

A02

a. With one offsite A.C. circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter. Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b.# With diesel generator set(s) 1A-A and/or 2A-A or 1B-B and/or 2B-B of the above required A.C. electrical power sources inoperable,* demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter, and determining OPERABLE diesel generator sets are not inoperable due to common cause failure or performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours; restore at least four diesel generator sets to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.8.1

Required actions, to verify OPERABLE diesel generator sets are not inoperable due to common cause failure or perform SR 4.8.1.1.2.a.4, shall be completed if this action is entered.

* No more than one diesel generator may be made simultaneously inoperable on a pre-planned basis for maintenance, modifications, or surveillance testing.

@ Offsite circuits utilizing USST 2A and USST 2B as the normal power sources require CSST A and CSST C to be available as the alternate power sources via automatic transfer at the associated 6.9 kV Unit Boards. (CSST B can be substituted for CSST A or CSST C.) This Note remains in effect until November 30, 2013, or until the USST modifications are implemented on Units 1 and 2, whichever occurs first.

ITS

A01

ITS 3.8.9

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying the diesel generator operates for at least 24 hours. During the first 2 hours to 2.25 hours of this test, the diesel generator shall be loaded between 4620 kw and 4840 kw and between 2380 kvar and 2600 kvar and during the remaining hours of this test, the diesel generator shall be loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar.

   The generator voltage and frequency shall be ≥ 6800 volts and ≥ 58.8 Hz within 10 seconds after the start signal. After energization, the steady state generator voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

   See ITS 3.8.1

4. Within 5 minutes of shutting down the diesel generator after it has operated ≥ 2 hours loaded between 3960 kw and 4400 kw and between 2140 kvar and 2370 kvar, verify that the diesel generator starts within 10 seconds after receipt of the start signal and operates for greater than or equal to 5 minutes. After energization, the steady state voltage and frequency shall be maintained ≥ 6800 volts and ≤ 7260 volts and ≥ 58.8 Hz and ≤ 61.2 Hz during this test.

See ITS 3.8.4 and 3.8.6

SR 3.8.9.1 4.8.1.1.3 The 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger for each diesel generator shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying:

   1. That the parameters in Table 4.8-1a meet the Category A limits.

   2. That the total battery terminal voltage is greater than or equal to 124 volts on float charge.

See ITS 3.8.4 and 3.8.6

b. At least once per 92 days by:

   1. Verifying that the parameters in Table 4.8-1a meet the Category B limits,

   2. Verifying there is no visible corrosion at either terminals or connectors, or the cell to terminal connection resistance of these items is less than 150 x 10^{-6} ohms, and

   3. Verifying that the average electrolyte temperature of 6 connected cells is above 60°F.

c. At least once per 18 months by verifying that:

   1. The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.

   2. The battery to battery and terminal connections are clean, tight and coated with anti-corrosion material.

   3. The resistance of each cell to terminal connection is less than or equal to 150 x 10^{-6} ohms.

See ITS 3.8.6

M01

Add proposed SR 3.8.9.1 with a Frequency of ~~7 days~~ In accordance with the Surveillance Frequency Control Program

LA02

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

LCO 3.8.9

3.8.2.1 The following A.C. electrical boards and inverters shall be OPERABLE and energized ~~with tie breakers open between redundant boards:~~ LA03

~~6900 Volt Shutdown Board 1A-A~~
~~6900 Volt Shutdown Board 1B-B~~
~~6900 Volt Shutdown Board 2A-A~~
~~6900 Volt Shutdown Board 2B-B~~
~~480 Volt Shutdown Board 1A1-A~~
~~480 Volt Shutdown Board 1A2-A~~
~~480 Volt Shutdown Board 1B1-B~~
~~480 Volt Shutdown Board 1B2-B~~
~~480 Volt Shutdown Board 2A1-A~~
~~480 Volt Shutdown Board 2A2-A~~
~~480 Volt Shutdown Board 2B1-B~~
~~480 Volt Shutdown Board 2B2-B~~ LA01

~~120 Volt A.C. Vital Instrument Power Board Channels 1-I and 2-I~~ See ITS 3.8.7
energized from inverters 1-I and 2-I connected to D.C. Channel I*#@.

~~120 Volt A.C. Vital Instrument Power Board Channels 1-II and 2-II~~
energized from inverter 1-II and 2-II connected to D.C. Channel II*#@.

~~120 Volt A.C. Vital Instrument Power Board Channels I-III and 2-III~~
energized from inverter 1-III and 2-III connected to D.C. Channel III*#@.

~~120 Volt A.C. Vital Instrument Power Board Channels I-IV and 2-IV~~
energized from inverter 1-IV and 2-IV connected to D.C. Channel IV*#@.

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

Add proposed Required Action A Note — A03

L03

ACTIONS

ACTION: Add proposed ACTION E — Unit 2 — L01

ACTION A
ACTION B
ACTION ~~F~~ G

a. With less than the above complement of A.C. boards OPERABLE and energized, restore the inoperable boards 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 D — L01

VKG025

b. With one inverter inoperable, energize the associated Vital Instrument Power Board within 8 hours; restore the inoperable inverter to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. See ITS 3.8.7

Add proposed ACTION ~~G~~ H — M02

SURVEILLANCE REQUIREMENTS

See ITS 3.8.7

SR 3.8.9.1

4.8.2.1 The specified A.C. boards and inverters shall be determined OPERABLE and energized ~~with tie breakers open between redundant boards~~ ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the busses. LA03

In accordance with the Surveillance Frequency Control Program

* Two inverters may be disconnected from their D.C. source for up to 24 hours for the purpose of performing an equalizing charge on their associated battery bank provided (1) the vital instrument power board is OPERABLE and energized, and (2) the vital instrument power boards associated with the other battery banks are OPERABLE and energized from their respective inverters connected to their respective D.C. sources. LA02 — See ITS 3.8.7

~~# D.C. Channel V may be substituted for any one channel of channels I - IV.~~ LA04

@ The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel. See ITS 3.8.7

ITS

A01

ITS 3.8.9

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

LCO 3.8.9

3.8.2.3 The following D.C. vital battery channels shall be OPERABLE and energized:

LA01

~~CHANNEL I~~ ~~Consisting of 125 - volt D.C. board No. I~~, 125 - volt D.C. battery bank No. I* and a full capacity charger.

~~CHANNEL II~~ ~~Consisting of 125 - volt D.C. board No. II~~, 125 - volt D.C. battery bank No. II*, and a full capacity charger.

~~CHANNEL III~~ ~~Consisting of 125 - volt D.C. board No. III~~, 125 - volt D.C. battery bank No. III*, and a full capacity charger.

~~CHANNEL IV~~ ~~Consisting of 125 - volt D.C. board No. IV~~, 125 - volt D. C. battery bank No. IV*, and a full capacity charger.

See ITS 3.8.4

Applicability

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTIONS

ACTION:

or more

L02

a. With one 125-volt D.C. board inoperable or not energized, restore the inoperable board to OPERABLE and energized status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION C

ACTION F

G

VKG025

b. With one 125-volt D.C. battery bank and/or its charger inoperable or not energized, restore the inoperable battery bank and/or charger to OPERABLE and energized status 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 3.8.4

SURVEILLANCE REQUIREMENTS

LA02

In accordance with the Surveillance Frequency Control Program

SR 3.8.9.1

4.8.2.3.1 Each D.C. bus train shall be determined OPERABLE and energized ~~with tie breakers open between redundant busses~~ ~~at least once per 7 days~~ by verifying correct breaker alignment, indicated power availability from the charger and battery, and voltage on the bus ~~of greater than or equal to 125 volts.~~

LA03

See ITS 3.8.4

LA05

4.8.2.3.2** Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying that the parameters in Table 4.8-2 meet the Category A limits, and

See ITS 3.8.4 and 3.8.6

* D.C. Battery Bank V may be substituted for any other Battery Bank as needed.
** This surveillance includes Battery Bank V, but not Charger V.

See ITS 3.8.4

DISCUSSION OF CHANGES
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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-1431, Rev. 4.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS does not contain specific ACTIONS for the condition where a diesel generator (DG) DC distribution subsystem is inoperable. However, the CTS definition of OPERABLE-OPERABILITY, CTS 1.19, states, in part, that a system, subsystem, train, or component or device shall be OPERABLE or have OPERABILITY when all necessary auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s). ITS 3.8.9, ACTION ~~E~~ F specifically states that when a DG DC ~~distribution subsystem~~ electrical power distribution panel is inoperable to declare the associated DG inoperable immediately. This changes the CTS by specifically stating the CTS 1.19 requirement in ITS LCO 3.8.9.

The purpose of ITS 3.8.9 is to ensure the necessary AC, vital DC, DG DC, and AC vital instrument electrical power distribution subsystems are available to provide emergency electrical power to ensure the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded and to mitigate postulated events. The change is acceptable since it is consistent with the requirements in CTS 1.19 that all attendant equipment must be capable of performing its related support function to support a required feature. Although not explicitly stated in CTS, this action is always applied due to the application of CTS 1.19. This change is designated as administrative because it does not result in technical changes to the CTS. VKG025

A03 CTS 3.8.2.1 ACTION a states, in part, that with less than the above complement of AC boards OPERABLE and energized, to restore the inoperable boards to OPERABLE status within 8 hours. ITS 3.8.9 Required Action A.1 allows 8 hours to restore ~~the associated unit's~~ AC electrical power distribution subsystem(s) to OPERABLE status. In addition, Required Action A.1 includes a Note that requires entry into applicable Conditions and Required Actions of LCO 3.8.4, "DC Sources – Operating," for vital DC ~~Sources~~ AC electrical power trains made inoperable by inoperable power distribution subsystems. This changes the CTS by explicitly requiring the compensatory actions for DC ~~Sources~~ AC electrical to be taken if made inoperable by inoperable power distribution subsystems. The discussion for limiting the Required Actions to the associated unit's AC boards is contained in DOC L01.

This change is acceptable because no changes are made to CTS requirements. The change in format from the CTS to the ITS maintains the technical requirements. The addition of the Note only acts as a reminder to enter the appropriate actions if the emergency bus which supplies the Train A or Train B shutdown

Enclosure 2, Volume 13, Rev. 1, Page 553 of 638

battery charger becomes de-energized. In the event an emergency board is inoperable such that a Train A or Train B battery charger were inoperable, ITS LCO 3.0.6 would allow taking only the Distribution System - Operating ACTIONS; taking exception to complying with the DC Sources - Operating ACTIONS. Since the Distribution System - Operating ACTIONS may not be sufficiently conservative in this event (i.e., a battery charger may be without power), specific direction to take appropriate ACTIONS for the DC Sources - Operating is added (ITS 3.8.9, Note to ACTION A) when there is no power to support the associated required battery charger. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 4.8.1.1.3 requires, in part, that the 125 volt DC distribution panel for each DG be demonstrated OPERABLE. ITS SR 3.8.9.1 requires, in part, verifying correct breaker alignments and voltage to the 125 volt DC distribution subsystem ~~for each DG~~. This changes the CTS by requiring correct breaker alignment verification and correct voltage for the DG DC ~~bus~~ electrical power distribution subsystem.

VKG025

The purpose of CTS 4.8.1.1.3 is to provide assurance that necessary power to required supported systems is available with sufficient capacity, capability, redundancy, and reliability to ensure the fuel, RCS, and containment design limits are not exceeded and postulated accidents are mitigated. This change is acceptable because it provides additional assurance that the panels associated with the DG DC bus electrical power distribution subsystem are OPERABLE. This change is designated as more restrictive because it adds a new Surveillance Requirement to the CTS for verification of correct breaker alignment and voltage.

M02 CTS 3.8.2.1 ACTION a states that with less than the above complement of AC boards OPERABLE and energized, to restore the inoperable boards to OPERABLE status within 8 hours. CTS 3.8.2.3 ACTION a states that with one 125 volt DC board inoperable, to restore the inoperable boards to OPERABLE status within 2 hours. However, there are no limitations to preclude a loss of function due to numerous concurrently inoperable AC and DC boards. ITS 3.8.9 ACTION ~~G~~ has been added, requiring entry into ITS 3.0.3 if the loss of two or more required electrical power distribution subsystems result in a loss of safety function. This changes CTS by adding an explicit Action to enter LCO 3.0.3 for a loss of two or more electrical power distribution subsystems that result in a loss of safety function.

H

The purpose of the CTS ACTIONS is to limit the time the unit can operate under these conditions. CTS 3.8.2.3 ACTION a specifies the compensatory actions for one inoperable DC board. With two inoperable DC boards, CTS 3.8.2.3 does not provide any actions and entry into LCO 3.0.3 would be required. CTS 3.8.2.1 ACTION a is applicable to all inoperable AC boards even if there is a loss of safety function. Certain combinations of inoperable AC and DC electrical power distribution subsystems result in a loss of safety function (e.g., an inoperable Train A AC electrical power distribution subsystem in combination with an

DISCUSSION OF CHANGES
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

H VKG025 inoperable Train B vital DC electrical power distribution subsystem). ITS 3.8.9 includes ACTION G, which requires immediate entry into LCO 3.0.3 if the loss of one or more required electrical power distribution subsystems boards results in a loss of safety function. ITS 3.8.9 Required Action G.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 required AC and/or DC boards inoperable that results in a loss of safety function. H

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.1.1.3.b.5 requires, in part, a separate 125 volt DC distribution panel to be OPERABLE for each DG. CTS 3.8.2.1 requires, in part, the AC electrical boards to be OPERABLE and lists the specific AC shutdown boards and AC vital instrument power board channels, including the applicable nominal voltage. CTS 3.8.2.3 requires, in part, vital DC boards to be OPERABLE and lists the specific boards and includes the nominal voltage. ITS LCO 3.8.9 requires the applicable electrical power distribution subsystems to be OPERABLE. This changes the CTS by moving the specific names of the buses and the associated nominal bus voltages (i.e., 6900 V, 480 V, 125 V, and 120 V) 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 3.8.9 retains the requirement for the required distribution subsystems to be OPERABLE. In addition, 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, requiring an 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 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.8.1.1.3 requires, in part, verification that the 125 volt DC distribution panel for each diesel generator is demonstrated OPERABLE. CTS 4.8.2.1 requires, in part, the specified AC boards to be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and indicated voltage on the busses. CTS 4.8.2.3.1 requires, in part, each DC bus train to be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment, indicated power availability from the charger and battery, and voltage on the bus. DOC M01 discusses addition of a surveillance requirement to verify correct alignments and voltage for the DG

Enclosure 2, Volume 13, Rev. 1, Page 555 of 638

DISCUSSION OF CHANGES
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

DC distribution subsystem with a frequency of 7 days. ITS SR 3.8.9.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA03 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 3.8.2.1 requires the AC electrical boards to be OPERABLE and energized "with tie breakers open between redundant boards." CTS 4.8.2.1 also requires the AC boards to be determined OPERABLE and energized from AC sources "with tie breakers open between redundant busses" by verifying correct breaker alignment and indicated voltage on the buses. CTS 4.8.2.3.1 requires, in part, the DC bus trains to be determined OPERABLE and energized "with tie breakers open between redundant buses". 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 alignments and voltage to required AC, vital DC, DG DC, and AC vital electrical power distribution subsystems. This changes the CTS by moving the procedural detail that the boards must have their tie breakers open between redundant boards from the CTS to the ITS Bases.

VKG025

instrument

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 alignments and voltage to required AC, vital DC, DG DC, and AC vital electrical power distribution subsystems. In addition, this change is acceptable because these types of procedural details 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

instrument

Enclosure 2, Volume 13, Rev. 1, Page 556 of 638

of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA04 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 4.8.2.1 states, in part, that the specified A.C. boards shall be determined OPERABLE by verifying correct breaker alignment. CTS 3.8.2.1 includes Note # that allows D.C. Channel V to be substituted for any one channel of channels I-IV, thus verification of correct breaker alignment is required when Channel V is substituted. ITS SR 3.8.9.1 does not contain this design information. This changes the CTS by moving the details that DC channel V can be substituted for any one of channels I-IV from the CTS to the ITS Bases.

VKG025

C

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 3.8.9 retains the requirement for the required distribution subsystems to be OPERABLE. In addition, 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, requiring an 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.

LA05 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 4.8.2.3.1 requires, in part, each DC bus to be determined OPERABLE by verifying voltage of greater than or equal to 125 volt DC on the bus. ITS SR 3.8.9.1 requires, in part, verification of correct breaker alignment and voltage to the DG DC electrical power distribution subsystems. This changes the CTS by removing the specified voltage limit from the surveillance and placing it in 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 requirement to verify the correct voltage to each diesel generator 125 volt DC distribution panel and to each vital DC board. In addition, 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.

LESS RESTRICTIVE CHANGES

L01 CTS 3.8.2.1 ACTION a requires that with less than the listed AC electrical boards OPERABLE and energized to restore the inoperable boards to OPERABLE status within 8 hours. ITS LCO 3.8.9 ACTION A requires that with one or more

due to one or more of the associated unit's AC shutdown boards inoperable

DISCUSSION OF CHANGES
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

VKG025

~~associated unit's~~ AC electrical power distribution subsystems ~~boards(s)~~ inoperable to restore AC electrical power distribution subsystem(s) to OPERABLE status within 8 hours. ITS 3.8.9 ACTION D requires that when one or more ~~opposite unit's~~ AC ~~boards~~ are inoperable to declare the associated supported required feature(s) inoperable immediately. This changes the CTS by providing a separate ACTION to declare the required supported feature(s) inoperable and follow the applicable ACTIONS for the affected shared system LCOs when the opposite unit's required AC boards are inoperable.

electrical power distribution subsystems

due to one or more of the opposite unit's AC shutdown boards inoperable

ITS 3.8.9 Condition D is modified by two notes. Note 1 states, "Only applicable during planned maintenance." Note 2 states, "Only applicable when Unit 2 [Unit 1] is defueled or in MODE 6 following defueled with Unit 2 [Unit 1] refueling water level ≥ 23 ft. above top of reactor vessel flange."

The safety function of the Standby AC Power System is to supply power to support the functioning of components and systems required to assure that (1) fuel design limits and reactor coolant pressure boundary design conditions are not exceeded due to anticipated operational occurrences, and (2) the core is cooled and vital functions are maintained in the event of postulated accidents, subject to loss of the Preferred Power System and subject to any single failure in the Standby Power System. To accomplish its safety function, the onsite Class 1E AC distribution system supplies electrical power to two power trains for each unit. Each power train includes two Class 1E 6.9 kV shutdown boards powered from one of two separate and independent offsite power lines or a dedicated onsite DG. Two DGs in one train can provide the safety related functions to mitigate a loss-of-coolant accident (LOCA) in one unit and safely shut down the other unit. The core cooling and containment cooling system loads are unitized to the respective unit's 6.9 kV shutdown boards. Although the core cooling systems and containment systems credited in the mitigation of an anticipated operational occurrence (AOO) or postulated Design Basis Accident (DBA) are unitized (not shared with the opposite unit) and powered from the associated unit's shutdown boards, some safety-related systems (e.g., Essential Raw Cooling Water (ERCW), Component Cooling (CCS), Emergency Gas Treatment (EGTS), Auxiliary Building Gas Treatment, (ABGTS), Control Room Emergency Ventilation (CREVS), and Control Room ~~HVAC~~ (CRACS)) are shared between the units. ~~The AC sources for these loads are distributed across both unit's shutdown boards.~~ Therefore, in addition to requiring the associated unit's boards to be OPERABLE; the opposite unit's boards supplying power to a required shared system component is also required to be OPERABLE. The purpose of CTS 3.8.2.1 ACTION a is to limit the time AC boards can be inoperable. The proposed change maintains the CTS ACTIONS and allowed outage time for the associated unit's AC boards, and proposes a new ACTION that changes the allowed outage time for the opposite unit's AC boards. 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. These changes are acceptable because the Required Actions associated with the required features 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 the inoperable features. If the necessary repairs cannot be made within the established Completion Time, the applicable Conditions for the affected shared system LCOs establish the Required Actions to exit the MODE of Applicability for that inoperable required feature. This change is acceptable because the provided ACTIONS effect restoration of the opposite unit's AC boards

Air Conditioning

The AC sources for these loads are supplied from an A Train and B Train AC shutdown board from a single unit.

shutdown

Enclosure 2, Volume 13, Rev. 1, Page 558 of 638

DISCUSSION OF CHANGES
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

shutdown

commensurate with the importance of maintaining these AC boards capable of supporting the associated unit's required feature(s). This change is designated as less restrictive, because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

VKG025

L02 (*Category 4 - Relaxation of Required Action*) CTS 3.8.2.3 ACTION a. states, "With one 125-volt D.C. board inoperable, restore the inoperable board to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours." For more than one 125-volt DC board inoperable, CTS 3.8.2.3 does not contain a specific requirement; therefore, entry into LCO 3.0.3 is required. ITS 3.8.9 CONDITION C provides Required Actions for one or more vital DC electrical power distribution subsystems inoperable. ITS 3.8.9 Required Action C.1 requires restoration of vital DC electrical power distribution subsystem(s) to OPERABLE status within 2 hours. Additionally, ITS 3.8.9 ACTION H requires entry into LCO 3.0.3, immediately, if two or more inoperable electrical power distribution subsystems result in a loss of safety function. This changes the CTS by allowing more than one 125-volt DC board to be inoperable, provides an additional hour to restore inoperable 125-volt DC boards to OPERABLE status, and eliminates the requirement to enter LCO 3.0.3 if more than one 125-volt DC board is inoperable and a loss of safety function has not occurred.

The purpose of CTS 3.8.2.3 is to ensure that two trains (subsystems) of the vital DC electrical power distribution system (four 125-volt DC boards, two per train) are capable of supplying the associated loads during a design bases accident (DBA). 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 that only a small amount of time is provided to restore the required features, and the low probability of a DBA occurring during the repair period. Allowing an additional hour to restore one or more inoperable vital DC electrical power distribution subsystems (or more than one 125-volt DC board) is appropriate as it may avoid a shutdown, a unit transient, while the vital DC electrical power distribution subsystem is not in full working order. The ITS requires immediate entry into LCO 3.0.3 if the loss of more than one vital DC electrical power distribution system results in a loss of safety function, therefore, all safety analysis assumptions are being met. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Insert L03

Enclosure 2, Volume 13, Rev. 1, Page 559 of 638

L03 VKG025

INSERT L03
Page 1 of 2

CTS 3.8.2.1 ACTION a requires that with less than the listed AC electrical boards OPERABLE and energized to restore the inoperable boards to OPERABLE status within 8 hours. ITS 3.8.9 ACTION A requires that with one or more AC electrical power distribution subsystems inoperable due to one or more of the associated unit's AC shutdown boards inoperable to restore AC electrical power distribution subsystem(s) to OPERABLE status within 8 hours. ITS 3.8.9 ACTION D requires that with one or more AC electrical power distribution subsystems inoperable due to one or more opposite unit AC shutdown boards inoperable to declare the associated required feature(s) inoperable immediately. ITS 3.8.9 Action D is only applicable during planned maintenance when the opposite unit is defueled or in MODE 6 following defueled with the opposite unit refueling water level $\geq$ 23 feet above top of the reactor vessel flange. ITS 3.8.9 ACTION E requires that with one or more AC electrical power distribution subsystems inoperable due to one or more opposite unit AC shutdown boards inoperable for reasons other than Condition D to restore AC electrical power distribution subsystem(s) to OPERABLE status in 24 hours. This changes the CTS by providing a new ACTION that extends the time allowed to restore to OPERABLE status the AC electrical power distribution subsystem(s) made inoperable due to the opposite unit's AC shutdown boards for other than planned maintenance from 8 hours to 24 hours.

The safety function of the Standby AC Power System is to supply power to support the functioning of components and systems required to assure that (1) fuel design limits and reactor coolant pressure boundary design conditions are not exceeded due to anticipated operational occurrences, and (2) the core is cooled and vital functions are maintained in the event of postulated accidents, subject to loss of the Preferred Power System and subject to any single failure in the Standby Power System. To accomplish its safety function, the onsite Class 1E AC distribution system supplies electrical power to two power trains for each unit. Each power train includes two Class 1E 6.9 kV shutdown boards powered from one of two separate and independent offsite power circuits or a dedicated onsite DG. Two DGs in one train can provide the safety related functions to mitigate a loss-of-coolant accident (LOCA) in one unit and safely shut down the other unit. The major core cooling and containment cooling system loads are unitized to the respective unit's 6.9 kV shutdown boards. Although the major core cooling systems and containment systems credited in the mitigation of an anticipated operational occurrence (AOO) or postulated Design Basis Accident (DBA) are unitized (not shared with the opposite unit) and powered from the associated unit's shutdown boards, some safety-related systems (e.g., Essential Raw Cooling Water (ERCW), Component Cooling (CCS), Emergency Gas Treatment (EGTS), Auxiliary Building Gas Treatment (ABGTS), Control Room Emergency Ventilation (CREVS), and Control Room Air Conditioning (CRACS)) are shared between the units. The AC sources for these loads are supplied from an A train and B train AC shutdown board from a single unit. Therefore, in addition to requiring the associated unit's boards to be OPERABLE, the opposite unit's boards supplying power to both trains of required shared system components are also required to be OPERABLE. The purpose of CTS 3.8.2.1 ACTION a is to limit the time AC boards can be inoperable. The proposed change maintains the CTS ACTIONS and allowed outage time for the associated unit's AC shutdown boards, and proposes a new ITS ACTION E that changes the allowed outage time from 8 hours to 24 hours for the opposite unit's AC shutdown boards that are inoperable for reasons other than planned maintenance. 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. These changes are acceptable because the 24 hour limit for the AC electrical power distribution

INSERT L03
Page 2 of 2

subsystems made inoperable due to the opposite unit's AC shutdown boards is more conservative than Completion Times allowed for the components that would be without power. This change is designated as less restrictive, because additional time is allowed to restore the OPERABILITY of the AC electrical power distribution subsystem(s) when the AC electrical power distribution subsystems are inoperable due to the opposite unit's AC shutdown boards under the ITS than under the CTS. VKG025

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

3.8 ELECTRICAL POWER SYSTEMS

VKG025

3.8.9 Distribution Systems - Operating

Two

vital

, and diesel generator (DG) DC

3.8.1.1
3.8.2.1
3.8.2.3

LCO 3.8.9 ~~Train A and Train B AC, DC, and AC vital bus~~ electrical power distribution ~~subsystems~~ shall be OPERABLE. 1 5

trains

Applicability
3.8.1.1
3.8.2.1
3.8.2.3

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
Unit 1 A. One or more AC electrical power distribution subsystems inoperable. due to one or more Unit 1 AC shutdown boards 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. vital electrical power AC electrical ---------- Unit 1 Restore AC electrical power distribution subsystem(s) to OPERABLE status.	8 hours
B. One or more AC vital ~~buses~~ inoperable. subsystems instrument power distribution	B.1 Restore AC vital ~~bus~~ subsystem(s) to OPERABLE status. instrument power distribution	8 ~~2~~ hours
C. One ~~or more~~ DC electrical power distribution subsystems inoperable. vital	C.1 Restore DC electrical power distribution subsystem~~(s)~~ to OPERABLE status. vital	2 hours

3.8.2.1 ACTION a. 2
DOC A03 2
1
1
3.8.2.1 ACTION a. 2
3.8.2.1 ACTION a. 1
3.8.2.3 ACTION a. DOC L02 1

STET

INSERT 1 2

VKG025

2 **INSERT 1**

D. One or more ~~Unit 2~~ AC electrical power distribution subsystems inoperable due to one or more Unit 2 AC shutdown boards inoperable	D.1	Declare associated required feature(s) inoperable.	Immediately
F ~~E.~~ One or more ~~required~~ DG DC ~~subsystems~~ electrical power distribution panels inoperable.	F ~~E.~~1	Declare associated supported DG inoperable.	Immediately

DOC L01

DOC A02

2

2

NOTES

1. Only applicable during planned maintenance.

2. Only applicable when Unit 2 is defueled or in MODE 6 following defueled with Unit 2 refueling water cavity level ≥ 23 ft. above top of reactor vessel flange.

6

E. One or more AC electrical power distribution subsystems inoperable due to one or more Unit 2 AC shutdown boards inoperable for reasons other than Condition D.	E.1 Restore Unit 2 AC electrical power distribution subsystem(s) to OPERABLE status.	24 hours

DOC L03

6

CTS

VKG025

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.8.2.1 ACTION a. 3.8.2.3 ACTION a. F G ~~D~~. Required Action and associated Completion Time not met. for Condition A, B, or C	G F ~~D~~.1 Be in MODE 3. AND G F ~~D~~.2 Be in MODE 5.	6 hours 36 hours (2)
H G ~~E~~. Two or more electrical power distribution subsystems inoperable that result in a loss of safety function. DOC M02	G H ~~E~~.1 Enter LCO 3.0.3.	Immediately (2)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
4.8.2.1 4.8.2.3.1 DOC M01 SR 3.8.9.1 Verify correct breaker alignments and voltage to ~~[~~required~]~~ AC, DC, and AC vital ~~bus~~ electrical power distribution subsystems. (vital; DG DC,; instrument)	~~[7 days~~ (3) (1) ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (4)

3.8 ELECTRICAL POWER SYSTEMS

VKG025

3.8.9 Distribution Systems - Operating

Two

vital

, and diesel generator (DG) DC

3.8.1.1
3.8.2.1
3.8.2.3

LCO 3.8.9 ~~Train A and Train B AC, DC, and AC vital bus~~ electrical power distribution ~~4~~ 5
~~subsystems~~ shall be OPERABLE.

trains

Applicability
3.8.1.1
3.8.2.1
3.8.2.3

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
Unit 2 A. One or more AC electrical power distribution subsystems inoperable. due to one or more Unit 2 AC shutdown boards 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. vital electrical power AC electrical ---------- Unit 2 Restore AC electrical power distribution subsystem(s) to OPERABLE status.	8 hours
B. One or more AC vital ~~buses~~ inoperable. subsystems instrument power distribution	B.1 Restore AC vital ~~bus~~ subsystem(s) to OPERABLE status. instrument power distribution	8 ~~2~~ hours
C. One ~~or more~~ DC electrical power distribution subsystem~~s~~ inoperable. vital	C.1 Restore DC electrical power distribution subsystem~~(s)~~ to OPERABLE status. vital	2 hours

3.8.1 ACTION a.
3.8.2.1 ACTION a.
DOC A03
3.8.2.1 ACTION a.
3.8.2.1 ACTION a.
3.8.2.3 ACTION a.
DOC L02

STET

INSERT 1

2 **INSERT 1**

VKG025

DOC L01 D. One or more ~~Unit 1~~ AC electrical power distribution subsystems inoperable due to one or more Unit 1 AC shutdown boards inoperable	D.1	Declare associated required feature(s) inoperable.	Immediately
DOC A02 F ~~E.~~ One or more ~~required~~ DG DC ~~subsystems~~ electrical power distribution panels inoperable.	F ~~E.~~1	Declare associated supported DG inoperable.	Immediately

NOTES

1. Only applicable during planned maintenance.

2. Only applicable when Unit 1 is defueled or in MODE 6 following defueled with Unit 1 refueling water cavity level ≥ 23 ft. above top of reactor vessel flange.

DOC L03

E. One or more AC electrical power distribution subsystems inoperable due to one or more Unit 1 AC shutdown boards inoperable for reasons other than Condition D.	E.1 Restore AC electrical power distribution subsystem(s) to OPERABLE status.	24 hours

CTS

VKG025

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.8.2.1 ACTION a. 3.8.2.3 ACTION a. F G ~~D~~. Required Action and associated Completion Time not met. for ~~Condition A, B, or C~~	G F ~~D~~.1 Be in MODE 3. AND G F ~~D~~.2 Be in MODE 5.	6 hours 36 hours (2)
DOC M02 H G ~~E~~. Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.	G H ~~E~~.1 Enter LCO 3.0.3.	Immediately (2)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
4.8.2.1 4.8.2.3.1 DOC M01 SR 3.8.9.1	Verify correct breaker alignments and voltage to ~~[~~required~~]~~ AC, DC, and AC vital ~~bus~~ electrical power distribution subsystems. (vital; DG DC,; instrument)	~~[7 days~~ (3) (1) ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (4)

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. Changes are made to the ISTS to reflect the interaction between an operating unit's electrical distribution subsystem and those credited features needing support from the opposite unit's associated electrical distribution subsystem.

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

4. ISTS SR 3.8.9.1 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.9.1 is "In accordance with the Surveillance Frequency Control Program." VKG025

5. ISTS LCO 3.8.9 is modified to: "Two electrical power distribution trains shall be OPERABLE." This change is made to simplify and clarify what is required to meet the LCO. As described in the ISTS Bases, each train consists of specific AC and DC electrical power distribution subsystems. Therefore, it is unnecessary to state in ISTS LCO 3.8.9 the specific electrical power distribution subsystems of Train A and B that are required to meet the LCO.

6. ISTS LCO 3.8.9 is modified to specify the Conditions that could be entered when an opposite unit's AC electrical power distribution subsystem is inoperable. During planned maintenance, the Condition entered will allow for an extended Completion Time versus the Condition if the subsystem is inoperable for reasons other than planned maintenance. The Condition that would be entered for planned maintenance also includes specific plant parameters that must be met in order to allow for an extended Completion Time.

Enclosure 2, Volume 13, Rev. 1, Page 567 of 638

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

VKG025

BASES

BACKGROUND

The onsite Class 1E AC, DC, and AC vital ~~bus~~ electrical power distribution systems are divided ~~by train~~ into ~~[~~two~~]~~ redundant and independent ~~AC, DC, and AC vital bus electrical power distribution subsystems.~~

Each ~~The~~ AC electrical power subsystem ~~for each train~~ consists of ~~a primary Engineered Safety Feature (ESF) 4.16 kV bus~~ and secondary ~~[~~480 ~~and 120]~~ V ~~buses, distribution panels, motor control centers and load centers~~. Each ~~[4.16 kV ESF bus]~~ has ~~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 bus]~~ is normally connected to a preferred offsite source. ~~After a loss of the preferred offsite power source to a 4.16 kV ESF bus, a transfer to the alternate offsite source is accomplished by utilizing a time delayed bus undervoltage relay.~~ If ~~all~~ offsite source~~s~~ ~~are~~ unavailable, the onsite emergency DG supplies power to the ~~4.16 kV ESF 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 buses, load centers, motor control centers, and distribution panels~~ shown in Table B 3.8.9-1.

consists of two Unit 1 120 V AC vital instrument power boards and two Unit 2 120 V AC vital instrument power boards

~~The~~ 120 VAC vital ~~buses~~ ~~are arranged in two load groups per train~~ and are ~~normally~~ powered from the inverters. ~~The alternate power supply for the vital 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~~ DC electrical power distribution subsystem consists of ~~[~~125~~]~~ V ~~bus(es) and distribution panel(s)~~.

The 125 V vital DC electrical power distribution subsystem has manual access to a fifth vital battery. The fifth vital battery is intended to serve as a replacement for any one of the four 125 V DC vital batteries with no loss of system reliabilty under any mode of operation.

The list of ~~all required~~ DC and ~~vital~~ AC distribution ~~buses [and panels]~~ is presented in Table B 3.8.9-1.

electrical power boards and distribution panels required for the

INSERT 6

1

INSERT 1

The two units share several structures and systems including the preferred and emergency (standby) electric power systems (UFSAR Chapter 8.0). The vital DC Power System is shared to the extent that a few loads (e.g., the vital inverters) in one nuclear unit are energized by the DC power channels assigned primarily to power loads of the other unit. In no case does the sharing inhibit the safe shutdown of one unit while the other unit is experiencing an accident. The Standby Power System serving each unit is divided into two redundant load groups (power trains). These power trains (Train A and Train B for each unit) supply power to safety-related equipment. Generally, the Engineered Safety Feature (ESF) loads assigned to a unit are supplied by the unit designated trains. For example, Safety Injection (SI) pump 1A-A (associated with Unit 1) is supplied by Shutdown Board 1A-A (also associated with Unit 1) while SI pump 2A-A (associated with Unit 2) is supplied by Shutdown Board 2A-A (also associated with Unit 2).

Separate and similar systems and equipment are provided for each unit when required. In certain instances, both units share systems or some components of a system. Shared systems are the exception to the unit/power system association. Because both units share the power system, one unit's power system(s) supports certain components required by the other unit (e.g., emergency gas treatment system). ~~To show the unit, train, board, and panel association, Table B 3.8.9-1 lists these power system components by train and unit designation.~~

VKG025

Each electrical power distribution train consists of:
a. an AC electrical power distribution subsystem,
b. an AC vital instrument power distribution subsystem,
c. a vital DC electrical power distribution subsystem, and
d. a diesel generator (DG) DC electrical power distribution subsystem.

1

INSERT 2

~~In addition, each diesel generator (DG) has an associated DC electrical power distribution panel.~~

1

INSERT 3

Each

electrical power

consists of two

DC

s that supply power to the respective DG's auxiliary loads

~~The~~ DG ~~125 Volt~~ DC distribution subsystem ~~includes a~~ 125 V distribution panel ~~for each DG~~. During normal operation, power is supplied to the distribution panel by a 480 VAC board through a battery charger. During emergency operation of the DG (loss of offsite power source), the distribution panel is supplied power from a ~~58 cell~~ battery. This panel supplies power for DG control, protection, and the engine DC lube oil circulating pump.

dedicated

(1) **INSERT 6**

VKG025

Associated with each board listed in Table B 3.8.9-1 are a number of safety significant electrical loads. When one or more of the boards specified in Table B 3.8.9-1 becomes inoperable, entry into the appropriate ACTIONS of LCO 3.8.9 is required. Some boards, distribution panels, and motor control centers (MCCs), which help comprise the AC and DC electrical power distribution subsystems, are not listed in Table B 3.8.9-1. The loss of electrical loads associated with these boards, panels, or MCCs may not result in a complete loss of a safety function necessary to shut down the reactor and maintain it in a safe condition. Therefore, should one or more of these boards, panels, or MCCs become inoperable due to a failure not affecting the OPERABILITY of a board listed in Table B 3.8.9-1 (e.g., a breaker supplying a single distribution panel fails open), the individual loads associated with the board, panel, or MCC are declared inoperable, and the appropriate Conditions and Required Actions of the LCOs governing the individual loads are entered.

BASES

VKG025

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter ~~[~~6~~]~~ (Ref. 1), and in the FSAR, 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.

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

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.~~

Insert 7

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.

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]~~.

VKG025

1 4 **INSERT 7**

Two electrical power distribution trains are required to be OPERABLE. Each train includes:

a. an AC electrical power distribution subsystem (i.e., one Unit 1 6.9 kV shutdown board, one Unit 2 6.9 kV shutdown board, and associated 480 V shutdown boards),
b. an AC vital instrument power distribution subsystem (i.e., two Unit 1 120 V AC instrument power boards and two Unit 2 120 V AC instrument power boards),
c. a vital DC electrical power distribution subsystem (i.e., two 125 V DC boards), and
d. a DG DC electrical power distribution subsystem (i.e., two 125 V DG distribution panels).

VKG025

BASES

LCO (continued)

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, that 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~~ 6.9 kV Shutdown Boards from being powered from the same offsite circuit.

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

With one or more ~~Unit 1~~ ~~Train A and B~~ required AC ~~boards~~ ~~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.

Condition A worst case 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

BASES

ACTIONS (continued)

VKG025

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 buses inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC vital buses are capable 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 bus must be restored to OPERABLE status within 2 hours by powering the bus from the associated [inverter via inverted DC-inverter using internal AC source, or Class 1E constant voltage transformer].

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, minimizing the potential for loss of power to the remaining vital buses and restoring power to the affected vital bus.

BASES

ACTIONS (continued)

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, that 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 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.

VKG025

The ~~2~~ hour Completion Time takes into account the importance to safety 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

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 distribution panels~~ must be restored to OPERABLE status within 2 hours by powering the ~~bus~~ from the associated battery or charger.

Condition C represents one ~~or more~~ DC ~~buses or distribution panels~~ 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~~.

BASES

ACTIONS (continued)

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that 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 DC ~~buses~~ is consistent with Regulatory Guide 1.93 (Ref. 3).

INSERT 4

~~F~~ G

~~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 plant systems.

VKG025

~~G~~ H

~~E~~.1

~~E~~ H

Condition ~~E~~ corresponds to a level of degradation in the electrical power 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.

1 4 **INSERT 4**

D.1

~~With one or more Unit 2 AC electrical power distribution subsystems (except AC vital) inoperable, the associated required feature(s) must be declared inoperable immediately and the appropriate Condition(s) entered. The Required Actions of these appropriate Conditions will determine the impact of the inoperable Unit 2 AC electrical power distribution subsystem.~~

F ~~E~~.1 electrical power distribution panels

affected

VKG025

With one or more ~~required~~ DG DC ~~subsystems~~ inoperable there is no longer assurance the supported DG is able to start and perform its necessary safety function. The DG must therefore be declared inoperable immediately and the ~~appropriate~~ Condition(s) entered.

(s) corresponding (s)

With one or more AC electrical power distribution subsystems (except AC vital instrument boards) inoperable due to one or more inoperable Unit 2 AC shutdown boards 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 associated required feature(s) must be declared inoperable immediately and the corresponding Condition(s) entered. The Required Action(s) of these Condition(s) will determine the impact of the inoperable Unit 2 AC shutdown board(s).

Condition D is modified by two notes that limit the conditions and parameters that allow entry into Condition D. The first note states that Condition D is only applicable during planned maintenance. This will allow the plant configuration to be aligned to minimize features being inoperable when the opposite unit shutdown board is made inoperable. The second note limits the applicability of Condition D to the time period when the opposite unit is either defueled or in MODE 6 following defueled with refueling water cavity level ≥ 23 ft. above the top of the reactor vessel flange. This note limits the time period allowing Condition D to be entered, minimizing when the allowance can be utilized. The allowance for Condition D is acceptable based on the following:

a. The opposite unit's AC shutdown boards are not as critical to the operating unit (fewer operating unit loads) as the operating unit's AC shutdown boards.

b. Performing maintenance on these components will increase the reliability of the Class 1E AC Electrical Power Distribution System.

c. The Required Actions associated with the features declared inoperable provide compensatory measures during the performance of the planned maintenance.

d. The limited opportunities that allow the planned maintenance to occur.

During the planned maintenance of the Unit 2 AC shutdown boards, if a condition is discovered on these boards requiring corrective maintenance, this maintenance may be performed under Condition D.

E.1

With one or more AC electrical power distribution subsystems (except AC vital instrument boards) inoperable due to one or more inoperable Unit 2 AC shutdown boards for reasons other than Condition D 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 inoperable Unit 2 AC electrical power distribution subsystem(s) must be returned to OPERABLE status within 24 hours. The 24 hour time limit before requiring a unit shutdown in this Condition is acceptable because the opposite unit's AC shutdown boards are not as critical to the operating unit (fewer operating unit loads) as the operating unit's AC shutdown boards.

VKG025

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

instrument

vital sub DG DC,

This Surveillance verifies that the ~~[~~required~~]~~ AC, DC, and AC vital ~~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.~~

power distribution trains

board

boards

2 1 4

1

6

~~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.~~

~~]~~

7

REFERENCES

U

1. FSAR, Chapter ~~[~~6~~]~~.

U

2. FSAR, Chapter ~~[~~15~~]~~.

3. Regulatory Guide 1.93, December 1974.

1 2

Safety Related Onsite

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

VKG025

INSERT 5

TYPE	VOLTAGE	TRAIN A*	TRAIN B*
AC safety buses	[4160 V]	[ESF Bus] [NB01]	[ESF Bus] [NB02]
	[480 V]	Load Centers [NG01, NG03]	Load Centers [NG02, NG04]
	[480 V]	Motor Control Centers [NG01A, NG01I, NG01B, NG03C, NG03I, NG03D]	Motor Control Centers [NG02A, NG02I, NG02B, NG04C, NG04I, NG04D]
	[120 V]	Distribution Panels [NP01, NP03]	Distribution Panels [NP02, NP04]
DC buses	[125 V]	Bus [NK01]	Bus [NK02]
		Bus [NK03]	Bus [NK04]
		Distribution Panels [NK41, NK43, NK51]	Distribution Panels [NK42, NK44, NK52]
AC vital buses	[120 V]	Bus [NN01]	Bus [NN02]
		Bus [NN03]	Bus [NN04]

1

* Each train of the AC and DC electrical power distribution systems is a subsystem.

1

VKG025

3.8.9

1 **INSERT 5**

TYPE	VOLTAGE (nominal)	SR 3.8.9.1 Voltage Range	TRAIN A*		TRAIN B*	
			SUBSYSTEMS		SUBSYSTEMS	
Vital DC ~~battery boards~~	125 V	≥ 129 V and ≤ 140 V	Board I	Board III	Board II	Board IV
AC ~~safety boards~~			Unit 1	Unit 2	Unit 1	Unit 2
	6900 V	≥ 6560 V and ≤ 7260 V	SD BD 1A-A	SD BD 2A-A	SD BD 1B-B	SD BD 2B-B
	480 V	≥ 440 V and ≤ 508 V	SD BD 1A1-A 1A2-A	SD BD 2A1-A 2A2-A	SD BD 1B1-B 1B2-B	SD BD 2B1-B 2B2-B
			~~Rx MOV Bd 1A1-A 1A2-A~~	~~Rx MOV Bd 2A1-A 2A2-A~~	~~Rx MOV Bd 1B1-B 1B2-B~~	~~Rx MOV Bd 2B1-B 2B2-B~~
			~~C & A Vent Bd 1A1-A~~	~~C & A Vent Bd 2A1-A~~	~~C & A Vent Bd 1B1-B~~	~~C & A Vent Bd 2B1-B~~
			~~Diesel Aux Bd 1A1-A 1A2-A~~	~~Diesel Aux Bd 2A1-A 2A2-A~~	~~Diesel Aux Bd 1B1-B 1B2-B~~	~~Diesel Aux Bd 2B1-B 2B2-B~~
			~~ERCW MCC 1A-A~~	~~ERCW MCC 2A-A~~	~~ERCW MCC 1B-B~~	~~ERCW MCC 2B-B~~
AC vital instrument power ~~boards~~	120 V	≥ 120.6 V and ≤ 126.6 V	Unit 1 Board 1-I Board 1-III	Unit 2 Board 2-I Board 2-III	Unit 1 Board 1-II Board 1-IV	Unit 2 Board 2-II Board 2-IV
DG DC ~~boards~~	125 V	≥ 124 V and ≤ 135 V	DG 1A-A Dist. Pnl.	DG 2A-A Dist. Pnl.	DG 1B-B Dist. Pnl.	DG 2B-B Dist. Pnl.

electrical power

electrical

electrical power

This page is replaced by Revised Insert 5. Changes made to INSERT 5 are illustrated on this page. Insertions are indicated by a text box with an arrow. Deletions are indicated with lines drawn through deleted text and highlighting. The subsystems in ITS Table B 3.8.9-1 have been reordered to align with the order of their description in the Bases Background Section.

(1) **REVISED INSERT 5** VKG025

TYPE	VOLTAGE (nominal)	SR 3.8.9.1 Voltage Range	TRAIN A SUBSYSTEMS		TRAIN B SUBSYSTEMS	
AC electrical power	6900 V	≥ 6560 V and ≤ 7260 V	Unit 1 SD BD 1A-A	Unit 2 SD BD 2A-A	Unit 1 SD BD 1B-B	Unit 2 SD BD 2B-B
	480 V	≥ 440 V and ≤ 508 V	SD BD 1A1-A 1A2-A	SD BD 2A1-A 2A2-A	SD BD 1B1-B 1B2-B	SD BD 2B1-B 2B2-B
AC vital instrument electrical power	120 V	≥ 120.6 V and ≤ 126.6 V	Unit 1 Board 1-I Board 1-III	Unit 2 Board 2-I Board 2-III	Unit 1 Board 1-II Board 1-IV	Unit 2 Board 2-II Board 2-IV
Vital DC electrical power	125 V	≥ 129 V and ≤ 140 V	Board I	Board III	Board II	Board IV
DG DC electrical power	125 V	≥ 124 V and ≤ 135 V	DG 1A-A Dist. Pnl.	DG 2A-A Dist. Pnl.	DG 1B-B Dist. Pnl.	DG 2B-B Dist. Pnl.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.9 Distribution Systems - Operating

VKG025

BASES

BACKGROUND

The onsite Class 1E AC, DC, and AC vital ~~bus~~ electrical power distribution systems are divided ~~by train~~ into ~~[~~two~~]~~ redundant and independent ~~AC, DC, and AC vital bus electrical power distribution subsystems.~~

The AC electrical power subsystem ~~for each train~~ consists of ~~a primary Engineered Safety Feature (ESF) 4.16 kV bus~~ and ~~secondary~~ ~~[~~480 ~~and 120]~~ V ~~buses, distribution panels, motor control centers and load centers~~. Each ~~[4.16 kV ESF bus]~~ has ~~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 bus]~~ is normally connected to a preferred offsite source. ~~After a loss of the preferred offsite power source to a 4.16 kV ESF bus, a transfer to the alternate offsite source is accomplished by utilizing a time delayed bus undervoltage relay.~~ If ~~all~~ offsite source~~s~~ ~~are~~ unavailable, the onsite emergency DG supplie~~s~~ power to the ~~4.16 kV ESF 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 buses, load centers, motor control centers, and distribution panels~~ shown in Table B 3.8.9-1.

The 120 VAC vital ~~buses~~ ~~are arranged in two load groups per train~~ and are ~~normally~~ powered from the inverters. ~~The alternate power supply for the vital 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 DC electrical power distribution subsystem consists of ~~[~~125~~]~~ V ~~bus(es) and distribution panel(s)~~.

The list of ~~all required~~ DC and ~~vital~~ AC distribution ~~buses [and panels]~~ is presented in Table B 3.8.9-1.

INSERT 6

1

INSERT 1

The two units share several structures and systems including the preferred and emergency (standby) electric power systems (UFSAR Chapter 8.0). The vital DC Power System is shared to the extent that a few loads (e.g., the vital inverters) in one nuclear unit are energized by the DC power channels assigned primarily to power loads of the other unit. In no case does the sharing inhibit the safe shutdown of one unit while the other unit is experiencing an accident. The Standby Power System serving each unit is divided into two redundant load groups (power trains). These power trains (Train A and Train B for each unit) supply power to safety-related equipment. Generally, the Engineered Safety Feature (ESF) loads assigned to a unit are supplied by the unit designated trains. For example, Safety Injection (SI) pump 1A-A (associated with Unit 1) is supplied by Shutdown Board 1A-A (also associated with Unit 1) while SI pump 2A-A (associated with Unit 2) is supplied by Shutdown Board 2A-A (also associated with Unit 2).

Separate and similar systems and equipment are provided for each unit when required. In certain instances, both units share systems or some components of a system. Shared systems are the exception to the unit/power system association. Because both units share the power system, one unit's power system(s) supports certain components required by the other unit (e.g., emergency gas treatment system). ~~To show the unit, train, board, and panel association, Table B 3.8.9-1 lists these power system components by train and unit designation.~~

Each electrical power distribution train consists of:
a. an AC electrical power distribution subsystem,
b. an AC vital instrument power distribution subsystem,
c. a vital DC electrical power distribution subsystem, and
d. a diesel generator (DG) DC electrical power distribution subsystem.

1

INSERT 2

VKG025

~~In addition, each diesel generator (DG) has an associated DC electrical power distribution panel.~~

1

INSERT 3

Each

electrical power

consists of two

DC

s that supply power to the respective DG's auxiliary loads

~~The~~ DG ~~125 Volt~~ DC distribution subsystem ~~includes a~~ 125 V distribution panel ~~for each DG~~. During normal operation, power is supplied to the distribution panel by a 480 VAC board through a battery charger. During emergency operation of the DG (loss of offsite power source), the distribution panel is supplied power from a ~~58 cell~~ battery. This panel supplies power for DG control, protection, and the engine DC lube oil circulating pump.

dedicated

(1) **INSERT 6**

VKG025

Associated with each board listed in Table B 3.8.9-1 are a number of safety significant electrical loads. When one or more of the boards specified in Table B 3.8.9-1 becomes inoperable, entry into the appropriate ACTIONS of LCO 3.8.9 is required. Some boards, distribution panels, and motor control centers (MCCs), which help comprise the AC and DC electrical power distribution subsystems, are not listed in Table B 3.8.9-1. The loss of electrical loads associated with these boards, panels, or MCCs may not result in a complete loss of a safety function necessary to shut down the reactor and maintain it in a safe condition. Therefore, should one or more of these boards, panels, or MCCs become inoperable due to a failure not affecting the OPERABILITY of a board listed in Table B 3.8.9-1 (e.g., a breaker supplying a single distribution panel fails open), the individual loads associated with the board, panel, or MCC are declared inoperable, and the appropriate Conditions and Required Actions of the LCOs governing the individual loads are entered.

BASES

VKG025

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter ~~[~~6~~]~~ (Ref. 1), and in the FSAR, 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.

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

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.~~

Insert 7

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.

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]~~.

(1) (4) **INSERT 7**

VKG025

Two electrical power distribution trains are required to be OPERABLE. Each train includes:

a. an AC electrical power distribution subsystem (i.e., one Unit 1 6.9 kV shutdown board, one Unit 2 6.9 kV shutdown board, and associated 480 V shutdown boards),
b. an AC vital instrument power distribution subsystem (i.e., two Unit 1 120 V AC instrument power boards and two Unit 2 120 V AC instrument power boards),
c. a vital DC electrical power distribution subsystem (i.e., two 125 V DC boards), and
d. a DG DC electrical power distribution subsystem (i.e., two 125 V DG distribution panels).

BASES

LCO (continued)

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, that 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~~ 6.9 kV Shutdown Boards from being powered from the same offsite circuit.

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

With one or more ~~Train A and B~~ Unit 2 required AC ~~buses, load centers, motor control centers, or distribution panels~~ boards (except AC vital ~~buses~~ portions of the), ~~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~~ boards must be restored to OPERABLE status within 8 hours.

Condition A worst case scenario is one train of Unit 2 boards 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 Unit 2 train by

BASES

ACTIONS (continued)

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.

VKG025

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 ~~buses~~ inoperable, and a loss of function has not yet occurred, the remaining OPERABLE AC vital ~~buses~~ are capable 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 ~~bus~~ must be restored to OPERABLE status within ~~2~~ hours by powering the ~~bus~~ from the associated ~~[~~inverter via inverted DC-inverter using internal AC source~~, or Class 1E constant voltage transformer]~~.

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, minimizing the potential for loss of power to the remaining vital ~~buses~~ and restoring power to the affected vital ~~bus~~.

BASES

ACTIONS (continued)

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, that 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 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.

VKG025

The ~~2~~ hour Completion Time takes into account the importance to safety 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

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 distribution panels~~ must be restored to OPERABLE status within 2 hours by powering the ~~bus~~ from the associated battery or charger.

Condition C represents one ~~or more~~ DC ~~buses or distribution panels~~ 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~~.

BASES

ACTIONS (continued)

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that 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.

VKG025

The 2 hour Completion Time for DC ~~buses~~ is consistent with Regulatory Guide 1.93 (Ref. 3).

INSERT 4

~~F~~ G

~~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 plant systems.

~~G~~ H

~~E~~.1

~~G~~ H

Condition ~~E~~ corresponds to a level of degradation in the electrical power 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.

1 4

INSERT 4

D.1

~~With one or more Unit 1 AC electrical power distribution subsystems (except AC vital) inoperable, the associated required feature(s) must be declared inoperable immediately and the appropriate Condition(s) entered. The Required Actions of these appropriate Conditions will determine the impact of the inoperable Unit 1 AC electrical power distribution subsystem.~~

F ~~E~~.1

electrical power distribution panels

VKG025

affected

With one or more ~~required~~ DG DC ~~subsystems~~ inoperable there is no longer assurance the supported DG is able to start and perform its necessary safety function. The DG must therefore be declared inoperable immediately and the ~~appropriate~~ Condition(s) entered.

(s) corresponding (s)

With one or more AC electrical power distribution subsystems (except AC vital instrument boards) inoperable due to one or more inoperable Unit 1 AC shutdown boards 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 associated required feature(s) must be declared inoperable immediately and the corresponding Condition(s) entered. The Required Action(s) of these Condition(s) will determine the impact of the inoperable Unit 1 AC shutdown board(s).

Condition D is modified by two notes that limit the conditions and parameters that allow entry into Condition D. The first note states that Condition D is only applicable during planned maintenance. This will allow the plant configuration to be aligned to minimize features being inoperable when the opposite unit shutdown board is made inoperable. The second note limits the applicability of Condition D to the time period when the opposite unit is either defueled or in MODE 6 following defueled with refueling water cavity level ≥ 23 ft. above the top of the reactor vessel flange. This note limits the time period allowing Condition D to be entered, minimizing when the allowance can be utilized. The allowance for Condition D is acceptable based on the following:

a. The opposite unit's AC shutdown boards are not as critical to the operating unit (fewer operating unit loads) as the operating unit's AC shutdown boards.

b. Performing maintenance on these components will increase the reliability of the Class 1E AC Electrical Power Distribution System.

c. The Required Actions associated with the features declared inoperable provide compensatory measures during the performance of the planned maintenance.

d. The limited opportunities that allow the planned maintenance to occur.

During the planned maintenance of the Unit 1 AC shutdown boards, if a condition is discovered on these boards requiring corrective maintenance, this maintenance may be performed under Condition D.

E.1

With one or more AC electrical power distribution subsystems (except AC vital instrument boards) inoperable due to one or more inoperable Unit 1 AC shutdown boards for reasons other than Condition D 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 inoperable Unit 1 AC electrical power distribution subsystem(s) must be returned to OPERABLE status within 24 hours. The 24 hour time limit before requiring a unit shutdown in this Condition is acceptable because the opposite unit's AC shutdown boards are not as critical to the operating unit (fewer operating unit loads) as the operating unit's AC shutdown boards.

Insert Page B 3.8.9-6

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the [required] AC, DC, and AC vital 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.

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.
----------]

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [15].
3. Regulatory Guide 1.93, December 1974.

Safety Related Onsite

VKG025

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

INSERT 5

TYPE	VOLTAGE	TRAIN A*	TRAIN B*
AC safety buses	[4160 V]	[ESF Bus] [NB01]	[ESF Bus] [NB02]
	[480 V]	Load Centers [NG01, NG03]	Load Centers [NG02, NG04]
	[480 V]	Motor Control Centers [NG01A, NG01I, NG01B, NG03C, NG03I, NG03D]	Motor Control Centers [NG02A, NG02I, NG02B, NG04C, NG04I, NG04D]
	[120 V]	Distribution Panels [NP01, NP03]	Distribution Panels [NP02, NP04]
DC buses	[125 V]	Bus [NK01]	Bus [NK02]
		Bus [NK03]	Bus [NK04]
		Distribution Panels [NK41, NK43, NK51]	Distribution Panels [NK42, NK44, NK52]
AC vital buses	[120 V]	Bus [NN01]	Bus [NN02]
		Bus [NN03]	Bus [NN04]

1

* Each train of the AC and DC electrical power distribution systems is a subsystem.

1

VKG025

3.8.9

1 **INSERT 5**

TYPE	VOLTAGE (nominal)	SR 3.8.9.1 Voltage Range	TRAIN A*		TRAIN B*	
			SUBSYSTEMS		SUBSYSTEMS	
Vital DC ~~battery boards~~	125 V	≥ 129 V and ≤ 140 V	Board I	Board III	Board II	Board IV
AC ~~safety boards~~			Unit 1	Unit 2	Unit 1	Unit 2
	6900 V	≥ 6560 V and ≤ 7260 V	SD BD 1A-A	SD BD 2A-A	SD BD 1B-B	SD BD 2B-B
	480 V	≥ 440 V and ≤ 508 V	SD BD 1A1-A 1A2-A	SD BD 2A1-A 2A2-A	SD BD 1B1-B 1B2-B	SD BD 2B1-B 2B2-B
			~~Rx MOV Bd 1A1-A 1A2-A~~	~~Rx MOV Bd 2A1-A 2A2-A~~	~~Rx MOV Bd 1B1-B 1B2-B~~	~~Rx MOV Bd 2B1-B 2B2-B~~
			~~C & A Vent Bd 1A1-A~~	~~C & A Vent Bd 2A1-A~~	~~C & A Vent Bd 1B1-B~~	~~C & A Vent Bd 2B1-B~~
			~~Diesel Aux Bd 1A1-A 1A2-A~~	~~Diesel Aux Bd 2A1-A 2A2-A~~	~~Diesel Aux Bd 1B1-B 1B2-B~~	~~Diesel Aux Bd 2B1-B 2B2-B~~
			~~ERCW MCC 1A-A~~	~~ERCW MCC 2A-A~~	~~ERCW MCC 1B-B~~	~~ERCW MCC 2B-B~~
AC vital instrument power ~~boards~~	120 V	≥ 120.6 V and ≤ 126.6 V	Unit 1 Board 1-I Board 1-III	Unit 2 Board 2-I Board 2-III	Unit 1 Board 1-II Board 1-IV	Unit 2 Board 2-II Board 2-IV
DG DC ~~boards~~	125 V	≥ 124 V and ≤ 135 V	DG 1A-A Dist. Pnl.	DG 2A-A Dist. Pnl.	DG 1B-B Dist. Pnl.	DG 2B-B Dist. Pnl.

electrical power

electrical

electrical power

This page is replaced by Revised Insert 5. Changes made to INSERT 5 are illustrated on this page. Insertions are indicated by a text box with an arrow. Deletions are indicated with lines drawn through deleted text and highlighting. The subsystems in ITS Table B 3.8.9-1 have been reordered to align with the order of their description in the Bases Background Section.

Insert Page B 3.8.9-8

(1) **REVISED INSERT 5**

VKG025

TYPE	VOLTAGE (nominal)	SR 3.8.9.1 Voltage Range	TRAIN A SUBSYSTEMS		TRAIN B SUBSYSTEMS	
AC electrical power	6900 V	≥ 6560 V and ≤ 7260 V	Unit 1 SD BD 1A-A	Unit 2 SD BD 2A-A	Unit 1 SD BD 1B-B	Unit 2 SD BD 2B-B
	480 V	≥ 440 V and ≤ 508 V	SD BD 1A1-A 1A2-A	SD BD 2A1-A 2A2-A	SD BD 1B1-B 1B2-B	SD BD 2B1-B 2B2-B
AC vital instrument electrical power	120 V	≥ 120.6 V and ≤ 126.6 V	Unit 1 Board 1-I Board 1-III	Unit 2 Board 2-I Board 2-III	Unit 1 Board 1-II Board 1-IV	Unit 2 Board 2-II Board 2-IV
Vital DC electrical power	125 V	≥ 129 V and ≤ 140 V	Board I	Board III	Board II	Board IV
DG DC electrical power	125 V	≥ 124 V and ≤ 135 V	DG 1A-A Dist. Pnl.	DG 2A-A Dist. Pnl.	DG 1B-B Dist. Pnl.	DG 2B-B Dist. Pnl.

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 Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. The punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

4. Changes are made to be consistent with changes made to the Specification.

5. Editorial changes made for enhanced clarity.

6. ISTS SR 3.8.9.1 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.9.1 is "In accordance with the Surveillance Frequency Control Program."

7. 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. VKG025

8. This redundant information has been deleted. Following the description of the electrical power distribution subsystems is a statement that a list of all boards and distribution panels is found in Table B 3.8.9-1.

9. Changes are made to ISTS 3.8.9 Bases Action A.1 to resolve a conflict within the first sentence. The first sentence states that, “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.” ISTS 3.8.9 Condition A states, “One or more AC electrical power distribution subsystems inoperable.” ISTS 3.8.9 Condition E states, “Two or more electrical power distribution subsystems inoperable that result in a loss of safety function.” Both Condition A and Condition E address a situation with more than one electrical power distribution subsystem inoperable. According to ITS Chapter 1.0, Use and Application, all applicable Conditions are required to be entered for an LCO. If it is discovered that the inoperability of more than one electrical power distribution subsystem results in a loss of safety function, then entry into ISTS 3.8.9 Conditions A and E would be required. If it is discovered that the inoperability does not result in a loss of safety function, then entry into ISTS 3.8.9 Condition A is all that is required regardless of the number of inoperable trains. ISTS 3.8.9 Condition A provides Required Actions if one or more AC electrical power distribution subsystems are inoperable and a loss of safety function has not occurred. It is not the intent of ISTS 3.8.9 Condition A to be applicable to only one inoperable train of AC electrical power distribution subsystems. Therefore, the phrase, “in one train,” has been deleted.

Enclosure 2, Volume 13, Rev. 1, Page 591 of 638

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGE L01

SQN is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." The proposed change involves making the Current Technical Specifications (CTS) less restrictive. Below are the description of this less restrictive change and the determination of No Significant Hazards Considerations for conversion to NUREG-1431.

CTS 3.8.2.1 ACTION a requires that with less than the listed AC electrical boards OPERABLE and energized to restore the inoperable boards to OPERABLE status within 8 hours. ITS LCO 3.8.9 ACTION A requires that with one or more associated unit's AC electrical power distribution subsystems boards(s) inoperable to restore AC electrical power distribution subsystem(s) to OPERABLE status within 8 hours. ITS 3.8.9 ACTION D requires that when one or more opposite unit's AC boards are inoperable to declare the associated supported required feature(s) inoperable immediately. This changes the CTS by providing a separate ACTION to declare the required supported feature(s) inoperable and follow the applicable ACTIONS for the affected shared system LCOs when the opposite unit's required AC boards are inoperable.

The safety function of the Standby AC Power System is to supply power to support the functioning of components and systems required to assure that (1) fuel design limits and reactor coolant pressure boundary design conditions are not exceeded due to anticipated operational occurrences, and (2) the core is cooled and vital functions are maintained in the event of postulated accidents, subject to loss of the Preferred Power System and subject to any single failure in the Standby Power System. To accomplish its safety function, the onsite Class 1E AC distribution system supplies electrical power to two power trains for each unit. Each power train includes two Class 1E 6.9 kV shutdown boards powered from one of two separate and independent offsite power lines or a dedicated onsite DG. Two DGs in one train can provide the safety related functions to mitigate a loss-of-coolant accident (LOCA) in one unit and safely shut down the other unit. The core cooling and containment cooling system loads are unitized to the respective unit's 6.9 kV shutdown boards. Although the core cooling systems and containment systems credited in the mitigation of an anticipated operational occurrence (AOO) or postulated Design Basis Accident (DBA) are unitized (not shared with the opposite unit) and powered from the associated unit's shutdown boards, some safety-related systems (e.g., Essential Raw Cooling Water (ERCW), Component Cooling (CCS), Emergency Gas Treatment (EGTS), Auxiliary Building Gas Treatment, (ABGTS), Control Room Emergency Ventilation (CREVS), and Control Room HVAC (CRACS)) are shared between the units. The AC sources for these loads are distributed across both unit's shutdown boards. Therefore, in addition to requiring the associated unit's boards to be OPERABLE; the opposite unit's boards supplying power to a required shared system component is also required to be OPERABLE. The purpose of CTS 3.8.2.1 ACTION a is to limit the time AC boards can be inoperable. The proposed change maintains the CTS ACTIONS and allowed outage time for the associated unit's AC boards, and proposes a new ACTION that changes the allowed outage time for the opposite unit's AC boards. 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

Enclosure 2, Volume 13, Rev. 0, Page 593 of 638

occurring during the repair period. These changes are acceptable because the Required Actions associated with the required features 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 the inoperable features. If the necessary repairs cannot be made within the established Completion Time, the applicable Conditions for the affected shared system LCOs establish the Required Actions to exit the MODE of Applicability for that inoperable required feature. This change is acceptable because the provided ACTIONS effect restoration of the opposite unit's AC boards commensurate with the importance of maintaining these AC boards capable of supporting the associated unit's required feature(s). This change is designated as less restrictive, because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Tennessee Valley Authority (TVA) has evaluated whether or not a significant hazards consideration is involved with these proposed Technical Specification changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change relaxes the Required Actions for the opposite unit's distribution system. This change will not affect the probability of an accident, since the distribution system are not initiators of any accident sequence analyzed in the Updated Final Safety Analysis Report (UFSAR). Rather, the opposite unit's distribution system support equipment used to mitigate accidents. The consequences of an analyzed accident will not be significantly increased since the minimum requirements for distribution systems will be maintained to ensure the availability of the required power to mitigate accidents assumed in the UFSAR. Operation in accordance with the proposed TS will ensure that sufficient onsite electrical distribution systems are OPERABLE as required to support the unit's required features. Therefore, the mitigating functions supported by the onsite electrical distribution systems will continue to provide the protection assumed by the accident analysis. The integrity of fission product barriers, plant configuration, and operating procedures as described in the UFSAR will not be affected by the proposed changes. Thus, the consequences of previously analyzed accidents will not increase by implementing these changes. Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No

The proposed change relaxes the Required Actions for the opposite unit's onsite electrical distribution systems. This change will not physically alter the plant (no new or different type of equipment will be installed). The proposed changes will maintain the minimum requirements for onsite electrical distribution systems to ensure the availability of the equipment required to mitigate accidents assumed in the UFSAR. Therefore,

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

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

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

Response: No.

The proposed change relaxes the Required Actions for the opposite unit's onsite electrical distribution system. The margin of safety is not affected by this change because the minimum requirements for onsite electrical distribution systems will be maintained to ensure the availability of the required power to shutdown the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Therefore, the proposed changes do not involve a significant reduction in a margin of safety

VKG025

Add INSERT 1

Enclosure 2, Volume 13, Rev. 1, Page 595 of 638

INSERT 1

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGE L03

VKG025

SQN is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." The proposed change involves making the Current Technical Specifications (CTS) less restrictive. Below are the description of this less restrictive change and the determination of No Significant Hazards Considerations for conversion to NUREG-1431.

CTS 3.8.2.1 ACTION a requires that with less than the listed AC electrical boards OPERABLE and energized to restore the inoperable boards to OPERABLE status within 8 hours. ITS LCO 3.8.9 ACTION A requires that with one or more AC electrical power distribution subsystems inoperable due to one or more of the associated unit's AC shutdown boards inoperable to restore the associated unit's AC electrical power distribution subsystem(s) to OPERABLE status within 8 hours. ITS 3.8.9 ACTION D requires that with one or more AC electrical power distribution subsystem(s) inoperable due to one or more opposite unit AC shutdown boards inoperable to declare the associated required feature(s) inoperable immediately. ITS 3.8.9 Action D is only applicable during planned maintenance when the opposite unit is defueled or in MODE 6 following defueled with the opposite unit refueling water level $\geq$23 feet above top of the reactor vessel flange. ITS 3.8.9 ACTION E requires that with one or more AC electrical power distribution subsystems inoperable due to one or more opposite unit AC shutdown boards inoperable for reasons other than Condition D to restore the opposite unit's AC electrical power distribution subsystem(s) to OPERABLE status in 24 hours. This changes the CTS by providing a new ACTION that extends the time allowed to restore to OPERABLE status the AC electrical power distribution subsystem(s) made inoperable due to the opposite unit's AC shutdown boards for other than planned maintenance from 8 hours to 24 hours.

The safety function of the Standby AC Power System is to supply power to support the functioning of components and systems required to assure that (1) fuel design limits and reactor coolant pressure boundary design conditions are not exceeded due to anticipated operational occurrences, and (2) the core is cooled and vital functions are maintained in the event of postulated accidents, subject to loss of the Preferred Power System and subject to any single failure in the Standby Power System. To accomplish its safety function, the onsite Class 1E AC distribution system supplies electrical power to two power trains for each unit. Each power train includes two Class 1E 6.9 kV shutdown boards powered from one of two separate and independent offsite power circuits or a dedicated onsite DG. Two DGs in one train can provide the safety related functions to mitigate a loss-of-coolant accident (LOCA) in one unit and safely shut down the other unit. The major core cooling and containment cooling system loads are unitized to the respective unit's 6.9 kV shutdown boards. Although the major core cooling systems and containment systems credited in the mitigation of an anticipated operational occurrence (AOO) or postulated Design Basis Accident (DBA) are unitized (not shared with the opposite unit) and powered from the associated unit's shutdown boards, some safety-related systems (e.g., Essential Raw Cooling Water (ERCW), Component Cooling (CCS), Emergency Gas Treatment (EGTS), Auxiliary Building Gas Treatment (ABGTS), Control Room Emergency Ventilation (CREVS), and Control Room Air Conditioning (CRACS)) are shared between the units. The AC sources for these loads are supplied from an A train and B train AC shutdown boards from a single unit.

Enclosure 2, Volume 13, Rev. 1, Page 595a of 638

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

VKG025

Therefore, in addition to requiring the associated unit's boards to be OPERABLE, the opposite unit's boards supplying power to both trains of required shared system components are also required to be OPERABLE. The purpose of CTS 3.8.2.1 ACTION a is to limit the time AC boards can be inoperable. The proposed change maintains the CTS ACTIONs and allowed outage time for the associated unit's AC shutdown boards, and proposes a new ITS ACTION E that changes the allowed outage time from 8 hours to 24 hours for the opposite unit's AC shutdown boards that are inoperable for reasons other than planned maintenance. 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. These changes are acceptable because the 24 hour limit for the AC electrical power distribution subsystems made inoperable due to the opposite unit's AC shutdown boards is more conservative than Completion Times allowed for the components that would be without power. This change is designated as less restrictive, because additional time is allowed to restore the OPERABILITY of the AC electrical power distribution subsystem(s) when the AC electrical power distribution subsystems are inoperable due to the opposite unit's AC shutdown boards under the ITS than under the CTS.

Tennessee Valley Authority (TVA) has evaluated whether or not a significant hazards consideration is involved with these proposed Technical Specification changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change relaxes the ACTIONs for the opposite unit's distribution system. This change will not affect the probability of an accident, since the distribution system is not an initiator of any accident sequence analyzed in the Updated Final Safety Analysis Report (UFSAR). Rather, the opposite unit's distribution system supports equipment used to mitigate accidents. The consequences of an analyzed accident will not be increased since the minimum requirements for distribution systems will be maintained to ensure the availability of the required power to mitigate accidents assumed in the UFSAR. Operation in accordance with the proposed TS will ensure that sufficient onsite electrical distribution systems are OPERABLE as required to support the unit's required features. Therefore, the mitigating functions supported by the onsite electrical distribution systems will continue to provide the protection assumed by the accident analysis. The integrity of fission product barriers, plant configuration, and operating procedures as described in the UFSAR will not be affected by the proposed changes. Thus, the consequences of previously analyzed accidents will not increase by implementing these changes. Therefore, the proposed changes do not involve an increase in the probability or consequences of an accident previously evaluated.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.8.9, DISTRIBUTION SYSTEMS - OPERATING

VKG025

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

Response: No

The proposed change relaxes the ACTIONs for the opposite unit's onsite electrical distribution systems. This change will not physically alter the plant (no new or different type of equipment will be installed). The proposed change will maintain the minimum requirements for onsite electrical distribution systems to ensure the availability of the equipment required to mitigate accidents assumed in the UFSAR. Therefore, operation of the facility in accordance with this proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The proposed change relaxes the ACTIONs for the opposite unit's onsite electrical distribution system. The margin of safety is not affected by this change because the minimum requirements for onsite electrical distribution systems will be maintained to ensure the availability of the required power to shutdown the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Therefore, the proposed changes do not involve a significant reduction in a margin of safety

ATTACHMENT 10

ITS 3.8.10, DISTRIBUTION SYSTEMS - SHUTDOWN

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

ELECTRICAL POWER SYSTEMS

SHUTD0WN

The necessary portion of the diesel generator (DG) DC distribution subsystem — M01

LIMITING CONDITION FOR OPERATION

to support equipment required to be OPERABLE. — M01

LCO 3.8.10

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 — See ITS 3.8.2

b. ~~Diesel~~ generator sets ~~1A-A and 2A-A or 1B-B and 2B-B each with~~: — LA01

1. Two diesels driving a common generator,

2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel per tank, — See ITS 3.8.2

3. A fuel storage system containing a minimum volume of 62,000 gallons of fuel, — See ITS 3.8.3

4. A fuel transfer pump, and — See ITS 3.8.2

5. ~~A separate 125-volt D.C. distribution panel~~, 125-volt D.C. battery bank and associated charger. — See ITS 3.8.5

Applicability

APPLICABILITY: MODES 5 and 6.

During movement of irradiated fuel assemblies — M02

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS and suspend operations involving positive reactivity additions that could result in loss of required shutdown margin or boron concentration. — See ITS 3.8.2

Add proposed ACTION B — A02

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

4.8.1.2 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 4.8.1.1.2.a.5), and 4.8.1.1.3. — See ITS 3.8.2

Add proposed SR 3.8.10.1 for DG DC distribution panels — M03

A01

ELECTRICAL POWER SYSTEMS

A.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

The necessary portion of — M01

See ITS 3.8.8

LCO 3.8.10

3.8.2.2 ~~As a minimum, the following~~ A.C. electrical boards and inverters shall be OPERABLE and energized~~:~~

to support equipment required to be OPERABLE. — M01

~~2~~ - ~~6900 volt shutdown boards, either 1A-A and 2A-A or 1B-B and 2B-B,~~

~~4~~ - ~~480 volt shutdown boards associated with the required OPERABLE 6900 volt shutdown boards,~~

LA01

~~2~~ - ~~120 volt A.C. vital instrument power boards either Channels I and III or Channels II and IV energized from their respective inverters~~# connected to their respective D.C. battery banks*, and 480 volt shutdown boards.

See ITS 3.8.8

Applicability

APPLICABILITY: MODES 5 and 6.

During movement of irradiated fuel assemblies — M02

ACTION:

Add proposed ACTIONS Note — M02

ACTION A

With less than the above complement of A.C. boards and inverters OPERABLE and energized, ~~establish CONTAINMENT INTEGRITY within 8 hours.~~

See ITS 3.8.8

Add Required Action A.2.1, A.2.2, A.2.3, and A.2.4 — L01

Add Required Action A.1 — M01

SURVEILLANCE REQUIREMENTS

See ITS 3.8.8

SR 3.8.10.1

4.8.2.2 The specified A.C. boards and inverters shall be determined OPERABLE and energized ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the bus.

In accordance with the Surveillance Frequency Control Program — LA02

* Any one of the inverters may be connected to D.C. Battery Bank V.

The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.

See ITS 3.8.8

ITS

A01

ITS 3.8.10

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

M01 — The necessary portions of the — See ITS 3.8.5

LCO 3.8.10

3.8.2.4 ~~As a minimum, the following~~ D.C. electrical equipment and boards shall be energized and 0PERABLE~~:~~ — M01 — to support equipment required to be OPERABLE.

~~2~~ - ~~125-volt D.C. boards either I and III or II and IV, and~~ — LA01

2* - 125-volt battery banks and chargers, one associated with each operable D.C. board — See ITS 3.8.5

Applicability

APPLICABILITY: MODES 5 and 6. — During movement of irradiated fuel assemblies — M02

ACTIONS

ACTION:

ACTION A

With less than the above complement of D.C. equipment and board OPERABLE, ~~establish CONTAINMENT INTEGRITY within 8 hours.~~ — Add Required Action A.2.1, A.2.2, A.2.3, and A.2.4 — L01

Add Required Action A.1 — M01

SURVEILLANCE REQUIREMENTS

In accordance with the Surveillance Frequency Control Program — LA02

SR 3.8.10.1

4.8.2.4.1 The above required 125-volt D.C. vital battery boards shall be determined OPERABLE and energized ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated power availability ~~with an overall battery voltage of greater than or equal to 125 volts~~. — LA01

4.8.2.4.2 The above required 125-volt D.C. vital battery banks and chargers shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2. — See ITS 3.8.5

* D.C. Battery Bank V may be substituted for any other Battery Bank. — See ITS 3.8.5

ELECTRICAL POWER SYSTEMS

3/4.8.3 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

CONTAINMENT PENETRATION CONDUCTOR OVERCURRENT PROTECTIVE DEVICES

LIMITING CONDITION FOR OPERATION

This specification is deleted.

(Pages 3/4 8-15 through 3/4 8-16 are deleted)

Enclosure 2, Volume 13, Rev. 0, Page 601 of 638

ELECTRICAL POWER SYSTEMS

MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION

LIMITING CONDITION FOR OPERATION

This specification is deleted.

(Page 3/4 8-17 is deleted)

Pages 3/4 8/18 through 3/4 8-19 intentionally deleted

Enclosure 2, Volume 13, Rev. 0, Page 603 of 638

ELECTRICAL POWER SYSTEMS

ISOLATION DEVICES

LIMITING CONDITION FOR OPERATION

This specification is deleted.

(Page 3/4 8-20 is deleted)

ITS

A01

ITS 3.8.10

ELECTRICAL POWER SYSTEMS

SHUTDOWN

The necessary portion of the diesel generator (DG) DC distribution subsystem — M01

LIMITING CONDITION FOR OPERATION

to support equipment required to be OPERABLE. — M01

LCO 3.8.10

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 — See ITS 3.8.2

b. ~~Diesel generator sets 1A-A and 2A-A or 1B-B and 2B-B each with~~: — LA01

1. Two diesels driving a common generator,

2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel per tank, — See ITS 3.8.2

3. A fuel storage system containing a minimum volume of 62,000 gallons of fuel, — See ITS 3.8.3

4. A fuel transfer pump, and — See ITS 3.8.2

5. ~~A separate 125-volt D.C. distribution panel~~, 125-volt D.C. battery bank and associated charger. — See ITS 3.8.5

Applicability

APPLICABILITY: MODES 5 and 6.

During movement of irradiated fuel assemblies — M02

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS and suspend operations involving positive reactivity additions that could result in loss of required shutdown margin or boron concentration. — See ITS 3.8.2

Add proposed ACTION B — A02

SR 3.8.10.1

SURVEILLANCE REQUIREMENTS

4.8.1.2 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 4.8.1.1.2.a.5), and 4.8.1.1.3. — See ITS 3.8.2

Add proposed SR 3.8.10.1 for DG DC distribution panels — M03

ITS

A01

ITS 3.8.10

ECTRICAL POWER SYSTEMS

A.C. DISTRIBUTION - SHUTDOWN

The necessary portion of — M01

LIMITING CONDITION FOR OPERATION

See ITS 3.8.8

LCO 3.8.10

3.8.2.2 ~~As a minimum, the following~~ A.C. electrical boards and inverters shall be OPERABLE and energized:

to support equipment required to be OPERABLE. — M01

~~2 - 6900 volt shutdown boards, either 1A-A and 2A-A or 1B-B and 2B-B,~~

~~4 - 480 volt shutdown boards associated with the required OPERABLE 6900 volt shutdown boards~~,

~~2 - 120 volt A.C. vital instrument power boards either Channels I and III or Channels II and IV energized from their respective inverters~~# connected to their respective D.C. battery banks,* and 480 volt shut-down boards.

LA01

See ITS 3.8.8

Applicability

APPLICABILITY: MODES 5 and 6.

During movement of irradiated fuel assemblies — M02

ACTION:

Add proposed ACTIONS Note — M02

ACTION A

With less than the above complement of A.C. boards and inverters OPERABLE and energized, ~~establish CONTAINMENT INTEGRITY within 8 hours~~.

See ITS 3.8.8

Add Required Action A.2.1, A.2.2, A.2.3, and A.2.4 — L01

Add Required Action A.1 — M01

SURVEILLANCE REQUIREMENTS

See ITS 3.8.8

SR 3.8.10.1

4.8.2.2 The specified A.C. boards and inverters shall be determined OPERABLE and energized ~~at least once per 7 days~~ by verifying correct breaker alignment and indicated voltage on the bus.

In accordance with the Surveillance Frequency Control Program — LA02

* Any one of the inverters may be connected to D.C. Battery Bank V.

The spare inverter for a specified channel may be substituted for one of the two inverters of the same channel.

See ITS 3.8.8

ITS

A01

ITS 3.8.10

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - SHUTDOWN

LIMITING CONDITION FOR OPERATION

M01 — The necessary portions of the — See ITS 3.8.5

LCO 3.8.10

3.8.2.4 ~~As a minimum, the following~~ D.C. electrical equipment and boards shall be and OPERABLE and energized~~:~~

M01 — to support equipment required to be OPERABLE.

~~2 - 125-volt D.C. boards either I and III or II and IV, and~~ — LA01

2* - 125-volt battery banks and chargers, one associated with each operable D.C. board — See ITS 3.8.5

Applicability

APPLICABILITY: MODES 5 and 6.

During movement of irradiated fuel assemblies — M02

ACTION:

ACTION A

With less than the above complement of D.C. equipment and board OPERABLE and energized~~, establish CONTAINMENT INTEGRITY within 8 hours~~.

Add Required Action A.2.1, A.2.2, A.2.3, and A.2.4 — L01

Add Required Action A.1 — M01

SURVEILLANCE REQUIREMENTS

In accordance with the Surveillance Frequency Control Program — LA02

SR 3.8.10.1

4.8.2.4.1 The above required 125-volt D.C. vital battery boards shall be determined OPERABLE and energized ~~at least once per 7 days~~ by verifying correct breaker alignment and voltage on the board ~~with an overall battery voltage of greater than or equal to 125 volts.~~ — LA01

4.8.2.4.2 The above required 125-volt D.C. vital battery banks and chargers shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2. — See ITS 3.8.5

* D.C. Battery Bank V may be substituted for any other Battery Bank. — See ITS 3.8.5

ELECTRICAL POWER SYSTEMS

3/4.8.3 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

CONTAINMENT PENETRATION CONDUCTOR OVERCURRENT PROTECTIVE DEVICES

LIMITING CONDITION FOR OPERATION

This specification is deleted.

(Pages 3/4 8-16 through 3/4 8-17 are deleted)

ELECTRICAL POWER SYSTEMS

MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION

SURVEILLANCE REQUIREMENT (Continued)

This specification is deleted.

(Page 3/4 8-18 is deleted)

Enclosure 2, Volume 13, Rev. 0, Page 609 of 638

Pages 3/4 8-19 through 3/4 8-20 intentionally deleted

ELECTRICAL POWER SYSTEMS

ISOLATION DEVICES

LIMITING CONDITION FOR OPERATION

This specification is deleted.

(Page 3/4 8-21 is deleted)

DISCUSSION OF CHANGES
ITS 3.8.10, DISTRIBUTION SYSTEMS - SHUTDOWN

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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-1431, Rev. 4.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

VKG025

A02 CTS 3.8.1.2.b.5 requires, in part, a separate and independent 125 volt DC distribution panel for diesel generator (DG) OPERABILITY. ITS 3.8.10 ACTION B requires for one or more inoperable DG DC electrical power distribution ~~subsystems~~ to immediately declare the associated DG inoperable. This changes the CTS by specifying an Action to declare a DG inoperable if its associated DC electrical power distribution ~~subsystem~~ is inoperable.

panels

panel

The purpose of CTS 3.8.1.2.b.5 is to specify the requirements for DG OPERABILITY. ITS 3.8.10 ACTION B preserves the intent of CTS 3.8.1.2.b.5 by declaring the DG inoperable if the associated DG DC distribution ~~subsystem~~ is inoperable. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

separate

M01 CTS 3.8.1.2.b.5 requires, in part, a ~~sparate~~ 125 volt DC distribution panel for each DG set to be OPERABLE. CTS 3.8.2.2 states, in part, that as a minimum the following AC electrical boards shall be OPERABLE and energized, and then lists the applicable boards. CTS 3.8.2.4 requires, in part, that as a minimum the following 125 volt DC boards shall be energized and OPERABLE as listed. ITS 3.8.10 states that the necessary portion of AC, vital DC, DG DC, and AC vital electrical power distribution subsystems shall 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 the CTS by requiring those necessary portions of electrical power distribution subsystems to be OPERABLE to support equipment required to be OPERABLE, which could require more distribution boards or panels to be OPERABLE than is currently required. In addition, an action has been added to allow an option to the existing actions.

instrument

The purpose of CTS 3.8.1.2.b.5, CTS 3.8.2.2 and CTS 3.8.2.4 is to ensure that at least one train of AC, vital DC, DG DC, and 120 volt AC vital electrical power distribution systems are OPERABLE. This change adds a requirement that the applicable portions of AC, vital DC, DG DC, and 120 volt AC vital electrical power distribution subsystems must be OPERABLE when required to support equipment required to be OPERABLE by the Technical Specifications. This

instrument

Enclosure 2, Volume 13, Rev. 1, Page 612 of 638

added restriction conservatively assures the needed electrical power distribution boards and panels are OPERABLE, even if this results in both trains of one or more of the electrical power distribution systems being required. Because 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 all 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, which requires the associated supported equipment to be declared inoperable, is also added. 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 and more boards may be required to be OPERABLE in ITS than in the CTS.

M02 CTS 3.8.1.2, CTS 3.8.2.2 and CTS 3.8.2.4 are applicable in MODES 5 and 6. ITS 3.8.10 is applicable in MODES 5 and 6 and during movement of irradiated fuel assemblies and contains an ACTIONS Note stating 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 a 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 electrical power subsystems 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 addition to the applicability is needed to ensure the appropriate electrical distribution system requirements are specified during fuel handling and to ensure the appropriate actions are taken (i.e., stop fuel movement) when the minimum electrical supply is not available. In addition, this change adds a clarification Note stating that LCO 3.0.3 is not applicable because LCO 3.0.3 has no Required Actions that restore safety. If moving irradiated fuel assemblies while in MODES 5 or 6, LCO 3.0.3 is not applicable because LCO 3.0.3 applicability is limited to MODES 1, 2, 3, and 4 only with a designated endpoint of MODE 5. In addition, 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 ITS 3.8.10 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 the activities with a potential for releasing radioactive materials. This change is designated as more restrictive because the ITS requires equipment to be OPERABLE during movement of irradiated fuel

assemblies both inside and outside of the containment, not only when in MODES 5 and 6.

M03 CTS 4.8.1.2 requires, in part, the performance of CTS 4.8.1.1.3, which includes a requirement that the 125 volt DC distribution panel for each DG be demonstrated OPERABLE. ITS SR 3.8.10.1 requires, in part, verification of the correct breaker alignments and voltage to the 125 volt DC distribution panel for each DG. This changes the CTS by adding a specific surveillance requiring verification of correct breaker alignment and correct voltage to the DG DC distribution subsystem.

The purpose of CTS 4.8.1.2 is to provide assurance that necessary power to required supported systems is available with sufficient capacity, capability, redundancy, and reliability to ensure the fuel, Reactor Coolant System, and containment design limits are not exceeded and postulated accidents are mitigated. This change is acceptable because it provides additional assurance that the distribution panels associated with the DG DC electrical power distribution subsystem are OPERABLE. This change is designated as more restrictive because it add a Surveillance Requirement to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.8.1.2 requires AC electrical power sources to be OPERABLE, listing the sources and subsystems. CTS LCO 3.8.2.2 requires AC electrical boards to be OPERABLE, listing the boards. CTS LCO 3.8.2.4 requires DC electrical equipment and boards to be energized and OPERABLE and CTS 4.8.2.4.1 requires the overall battery voltage to be greater than or equal to 125 volts. ITS LCO 3.8.10 requires necessary portions of the AC, vital DC, DG DC, and AC vital electrical power distribution subsystems to be OPERABLE to support equipment required to be OPERABLE. ITS SR 3.8.10.1 requires the verification of correct breaker alignment and voltage to each required AC, vital DC, and ~~vital~~ AC electrical power distribution subsystem. The details of the boards are contained in the ITS Bases. This changes the CTS by moving description of the boards and panels (including the nominal voltages and any specified limits) from the CTS to the ITS Bases.

VKG025

instrument

vital instrument

The removal of these details relating 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 requirement for the electrical power distribution subsystems to be OPERABLE and requires the verification of correct breaker alignment and voltage to required AC and DC electrical power distribution subsystems. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the

DISCUSSION OF CHANGES
ITS 3.8.10, DISTRIBUTION SYSTEMS - SHUTDOWN

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 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.8.2.2 requires, in part, that the specified AC boards be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and indicated voltage on the buses. CTS 4.8.2.4.1 requires, in part, that each required DC battery board be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and indicated power availability with an overall battery voltage of greater than or equal to 125 volts. ITS SR 3.8.10.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for this SR and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* With less than the minimum complement of AC boards OPERABLE and energized, CTS 3.8.2.2 requires the establishment of containment integrity within 8 hours. With less than the minimum complement of DC boards OPERABLE and energized, CTS 3.8.2.4 also requires the establishment of containment integrity within 8 hours. ITS 3.8.10 ACTION A requires, in part, 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, vital DC, and AC vital board electrical power distribution subsystems to OPERABLE status, and the declaration of the associated required residual heat removal subsystems(s) inoperable and not in

VKG025

instrument

Enclosure 2, Volume 13, Rev. 1, Page 615 of 638

DISCUSSION OF CHANGES
ITS 3.8.10, DISTRIBUTION SYSTEMS - SHUTDOWN

operation. This changes the CTS by replacing the existing Required Action to restore containment integrity.

The purpose of the CTS 3.8.2.2 Action and 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. This change is acceptable because the Required Actions establish remedial measures 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 including 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, vital DC, and AC vital electrical power distribution subsystems to OPERABLE status, and the declaration of the associated required residual 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 actions to restore required AC, vital DC, and AC vital electrical power distribution subsystems to OPERABLE status will place the plant in compliance with the LCO. Declaration of the associated required decay heat removal subsystems(s) inoperable and not in operation will require the plant to enter the applicable LCOs to apply additional Required Actions. The proposed actions will immediately minimize the potential for any accident releases outside of containment and are considered acceptable instead 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.

VKG025

instrument

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

3.8 ELECTRICAL POWER SYSTEMS

VKG025

3.8.10 Distribution Systems - Shutdown

3.8.1.2, 3.8.2.2, 3.8.2.4

LCO 3.8.10 The necessary portion of AC, DC, ~~and~~ AC vital ~~bus~~ electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

vital; instrument; , and diesel generator (DG) DC; 1

Applicability 3.8.1.2, 3.8.2.2, 3.8.2.4 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 3.8.2.2 3.8.2.4 DOC M01 A. One or more required AC, DC, or AC vital ~~bus~~ electrical power distribution subsystems inoperable. vital; instrument VKG025 DOC L01	A.1 Declare associated supported required feature(s) inoperable. OR A.2.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies. AND DOC L01 A.2.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND	Immediately 1 Immediately 2 Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.3 Initiate actions to restore required AC, DC, and AC vital ~~bus~~ electrical power distribution subsystems to OPERABLE status.	Immediately
	AND	
	A.2.4 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, ~~and~~ AC vital ~~bus~~ electrical power distribution subsystems. , and DG DC	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

1

INSERT 1

B.	One or more required DG DC electrical power distribution ~~subsystems~~ panels inoperable.	B.1	Declare associated DG(s) inoperable.	Immediately

DOC A02

VKG025

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

VKG025

3.8.1.2, 3.8.2.2, 3.8.2.4

LCO 3.8.10 The necessary portion of AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

vital; instrument; , and diesel generator (DG) DC; 1

Applicability 3.8.1.2, 3.8.2.2, 3.8.2.4 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 3.8.2.2 3.8.2.4 DOC M01 A. One or more required AC, DC, or AC vital bus electrical power distribution subsystems inoperable. (vital; instrument)	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	OR	
VKG025 DOC L01	A.2.1 Suspend movement of [recently] irradiated fuel assemblies.	Immediately
	AND	
DOC L01	A.2.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	AND	

1; 2

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2.3 Initiate actions to restore required AC, DC, and AC vital ~~bus~~ electrical power distribution subsystems to OPERABLE status.	Immediately
	AND	
	A.2.4 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, ~~and~~ AC vital ~~bus~~ electrical power distribution subsystems. , and DG DC	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

1

INSERT 1

B. One or more required DG DC electrical power distribution ~~subsystems~~ panels inoperable.	B.1	Declare associated DG(s) inoperable.	Immediately

DOC A02

VKG025

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 Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. ISTS SR 3.8.10.1 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.8.10.1 is "In accordance with the Surveillance Frequency Control Program."

Enclosure 2, Volume 13, Rev. 0, Page 624 of 638

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

VKG025

BACKGROUND

A description of the AC, DC, and AC vital ~~bus~~ electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the FSAR, Chapter ~~[~~6~~]~~ (Ref. 1) and Chapter ~~[~~15~~]~~ (Ref. 2), assume Engineered Safety Feature (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.

The OPERABILITY of the AC, DC, and AC vital ~~bus~~ electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC, DC, and AC vital ~~bus~~ electrical power distribution subsystems during MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel 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 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 and 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)]~~.

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 plant 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 distribution system necessary to support OPERABILITY of required systems, equipment, and components - all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

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.

VKG025

vital, DG DC, instrument

The AC, DC, and AC vital ~~bus~~ electrical power distribution subsystems 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. 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 subsystem 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 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.

2

2

Suspension of these activities does 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 residual heat removal (RHR) subsystem may be 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 RHR ACTIONS would not be entered. Therefore, Required Action A.2.~~5~~ is provided to direct declaring RHR inoperable, which results in taking the appropriate RHR actions.

3

3

4

3

and not in operation