ORAS 5/15/85
RBK 5/17/85

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Memo for: Dennis M. Crutchfield, AD for Safety Assessment, DL

Thomas M. Novak, AD for Licensing, DL

Much required from RB

From: L.S. Rubenstein, AD for Core and Plant Systems, DSI

Subject: Final Draft of the River Bend Unit 1 Technical Specifications

In response to your memorandum dated April 19, 1985, the Power Systems Branch has reviewed those sections of the River Bend Unit 1 Technical specifications which are in the Power Systems Branch area of responsibility. The sections reviewed by PSB are: Item 5 in Tables 3.3.3-1, 3.3.3-2, and 4.3.3.1-1; Section 3/4.8.8, Section 3/4.8, and Section B 3/4.8. PSB comments are provided in the enclosed marked-up pages of the River Bend Technical specifications. Because some issues are still undergoing resolution with the applicant, portions of the River Bend Technical specifications may require additional changes at a later date.

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B/11

TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP FUNCTION(a)	APPLICABLE OPERATIONAL CONDITIONS	ACTION
C. DIVISION 3 TRIP SYSTEM			
1. HPCS SYSTEM			
a. Reactor Vessel Water Level - Low, Low, Level 2	4(b)	1, 2, 3, 4*, 5*	34(e)
b. Drywell Pressure - High	4(b)	1, 2, 3	34(e)
c. Reactor Vessel Water Level-High, Level 8	2(c)	1, 2, 3, 4*, 5*	31
d. Condensate Storage Tank Level-Low	2(d)	1, 2, 3, 4*, 5*	35
e. Suppression Pool Water Level-High	2(d)	1, 2, 3, 4*, 5*	35
f. Pump Discharge Pressure-High (Bypass)	1	1, 2, 3, 4*, 5*	33
g. HPCS System Flow Rate-Low (Permissive)	1	1, 2, 3, 4*, 5*	33
h. Manual Initiation	1	1, 2, 3, 4*, 5*	33

	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS	APPLICABLE OPERATIONAL CONDITIONS	ACTION
D. LOSS OF POWER					
1. Division 1 and 2					
a. 4.16 kv Standby Bus Undervoltage (Sustained Undervoltage)	3/bus	2/bus	3/bus	1, 2, 3, 4**, 5**	37
b. 4.16 kv Standby Bus Undervoltage (Degraded Voltage)	3/bus	2/bus	3/bus	1, 2, 3, 4**, 5**	37
2. Division 3					
a. 4.16 kv Standby Bus Undervoltage (Sustained Undervoltage)	4/bus	2/bus	4/bus	1, 2, 3, 4**, 5**	37
b. 4.16 kV Standby Bus Undervoltage (Degraded Voltage)	4/bus	2/bus	4/bus	1, 2, 3, 4**, 5**	37

See footnotes on next page

Tentative, final configuration to be based upon resolution of outstanding issue

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TABLE 3.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

ACTION

ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. With one channel inoperable, place the inoperable channel in the tripped condition within one hour* or declare the associated system inoperable.
b. With more than one channel inoperable, declare the associated system inoperable.

ACTION 31 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, declare the associated ADS trip system or ECCS inoperable.

ACTION 32 - With the number of OPERABLE channels less than the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within one hour.

ACTION 33 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within 8 hours or declare the associated ADS valve or ECCS inoperable.

ACTION 34 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. For one trip system, place that trip system in the tripped condition within one hour* or declare the HPCS system inoperable.
b. For both trip systems, declare the HPCS system inoperable.

ACTION 35 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place at least one inoperable channel in the tripped condition within one hour* or declare the HPCS system inoperable.

ACTION ~~36~~ 37 - With the number of OPERABLE channels less than the Total Number of Channels, declare the associated emergency diesel generator inoperable and take the ACTION required by Specification 3.8.1.1 or 3.8.1.2, as appropriate.

Lawrence Kabbett

ACTION ~~38~~ 37 36 - With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable channel in the tripped condition within 1 hour*. Operation may then continue until performance of the next required CHANNEL FUNCTIONAL TEST.

*The provisions of Specification 3.0.4 are not applicable.

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TABLE 3.3.3-2 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
C. DIVISION 3 TRIP SYSTEM		
1. HPCS SYSTEM		
a. Reactor Vessel Water Level - (Low Low, Level 2)	≥ -45.5 inches*	≥ -47.7 inches
b. Drywell Pressure - High	≤ 1.68 psig	≤ 1.88 psig
c. Reactor Vessel Water Level - High, Level 8	≤ 52 inches*	≤ 54.2 inches
d. Condensate Storage Tank Level - Low	≥ 24 inches**	≥ 19 inches**
e. Suppression Pool Water Level - High	≤ 16 inches#	≤ 16.9 inches#
f. Pump Discharge Pressure - High	≤ 120 psig increasing	≤ 145 psig increasing
g. HPCS System Flow Rate - Low	≤ 500 gpm	≥ 625 gpm
h. Manual Initiation	NA	NA
D. LOSS OF POWER		
1. Division 1 and 2		
a. 4.16 kv Emergency Bus Undervoltage (Sustained Undervoltage)##	a. 4.16 kV Basis - 2970 volts b. ≤ 3 sec. time delay	2970 ± 148 volts ≤ 3±0.055 sec. time delay
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	a. 4.16 kv Basis - 3796 ~~3740~~ volts b. ≤ 60 sec. time delay (w/o LOCA) ≤ 3 sec. time delay (w/@ LOCA)	3795 ~~3740~~ 3740±107 volts 60±0.055 sec. time delay 3±0.055 sec. time delay

Tentative, final setpoints to be based upon resolution of outstanding issues.

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EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
D. LOSS OF POWER (continued)		
2. Division 3		
a. 4.16 kv Standby Bus Undervoltage (Sustained Undervoltage)		
a. 4.16 kv Basis - >3045± volts	3045±61 volts	
b. 120 v Basis - >87 volts	87±2 volts	
c. ≤ 3 sec. time delay	3±0.055 sec. time delay	
b. 4.16 kV Standby Bus Undervoltage (Degraded Voltage)		
a. 4.16 kV Basis - 3744 volts	3744 ± 40 volts	
b. ≤ 60 sec. time delay (w/o LOCA)	60±0.055 sec. time delay	
≤ 3 sec. time delay (w/LOCA)	3± 0.055 sec. time delay	

Tentative, final setpoints to be based upon resolution of outstanding issues.

*See Bases Figure B 3/4 3-1.

**(Bottom of CST is at EL 95'1." The levels are measured from the instrument zero level of EL 96'6."

#(Bottom of suppression pool is at EL 70'.) The levels are measured from the instrument zero level of EL 89'9."

##These are inverse time delay voltage relays or instantaneous voltage relays with a time delay. The voltages shown are the maximum that will not result in a trip. Lower voltage conditions will result in decreased trip times.

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TABLE 4.3.3.1-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED
C. DIVISION 3 TRIP SYSTEM				
1. HPCS SYSTEM				
a. Reactor Vessel Water Level - Low Low, Level 2	S	M	R(a)	1, 2, 3, 4*, 5*
b. Drywell Pressure-High	S	M	R(a)	1, 2, 3
c. Reactor Vessel Water Level-High, Level 8	S	M	R(a)	1, 2, 3, 4*, 5*
d. Condensate Storage Tank Level - Low	S	M	R(a)	1, 2, 3, 4*, 5*
e. Suppression Pool Water Level - High	S	M	R(a)	1, 2, 3, 4*, 5*
f. Pump Discharge Pressure-High	S	M	R(a)	1, 2, 3, 4*, 5*
g. HPCS System Flow Rate-Low	S	M	R(a)	1, 2, 3, 4*, 5*
h. Manual Initiation	NA	M(b)	NA	1, 2, 3, 4*, 5*
D. LOSS OF POWER				
1. Division 1 and 2				
a. 4.16 kv Standby Bus Undervoltage (Sustained Undervoltage)	S	M	R	1, 2, 3, 4**, 5**
b. 4.16 kv Standby Bus Undervoltage (Degraded Voltage)	S	M	R	1, 2, 3, 4**, 5**
2. Division 3				
a. 4.16 kv Standby Bus Undervoltage (Sustained Undervoltage)	S	M	R	1, 2, 3, 4**, 5**

Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 100 psig.
* When the system is required to be OPERABLE per Specification 3.5.2.
** Required when ESF equipment is required to be OPERABLE.
(a) Calibrate trip unit setpoint at least once per 31 days.
(b) All circuitry associated with manual initiation other than manual initiation switches shall receive a CHANNEL FUNCTIONAL TEST at least once per 31 days as a part of circuitry required to be tested for automatic system actuation. Manual initiation switches shall be tested at least once per 18 months during shutdown.

{ b. 4.16 kV Standby Bus Under-voltage (Degraded Voltage) S M R 1, 2, 3, 4**, 5**

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ACTION (Continued)

c. With diesel generator 1C of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a and 4.8.1.1.2.a.4 within one hour and at least once per 8 hours thereafter; restore the inoperable diesel generator 1C to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by Specification 3.5.1.

d. With diesel generator 1A or 1C / 1B of the above required A.C. / or c electrical power sources inoperable, in addition to ACTION a or b, as applicable, verify within 2 hours that all required systems, subsystems, trains, components and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and the C standby service water pump OPERABLE if diesel generator 1B is in operable; otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

e. With two of the above required offsite circuits inoperable, demonstrate the OPERABILITY of three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 within one hour and at least once per 8 hours thereafter, unless the diesel generators are already operating; restore at least one of the inoperable offsite circuits to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

f. With diesel generators 1A and 1B of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a and 4.8.1.1.2.a.4 within one hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators 1A and 1B to OPERABLE status within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore both diesel generators 1A and 1B to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

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

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months during shutdown by manually transferring unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE: *

a. In accordance with the frequency specified in Table 4.8.1.1.2-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day fuel tank.

2. Verifying the fuel level in the fuel storage tank.

3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.

4. Verifying the diesel starts from ambient condition and accelerates to at least 450 rpm for diesel generators 1A and 1B and 900 rpm for diesel generator 1C in less than or equal to 10 seconds. (*) The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 3 Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals: (1.2)

a) Manual.
b) Simulated loss of offsite power by itself.
c) Simulated loss of offsite power in conjunction with an ESF actuation test signal.
d) An ESF actuation test signal by itself.

*All diesel generator starts for the purpose of this surveillance test may be preceded by an engine prelube period. Further, all surveillance tests, with the exception of once per 184 days, may also be preceded by warmup procedures (e.g. gradual acceleration and/or gradual loading > 150 sec.) as recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

*The diesel generator start (10 sec) and subsequent loading (60 sec) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts and loading for the purpose of this surveillance testing may be preceded by an engine prelube period and/or other warmup procedure recommended by the manufacturer to minimize mechanical stress and wear on the engine.

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SURVEILLANCE REQUIREMENTS (Continued)

This may change depending on final resolution of TDI issues

5. Verifying the diesel generator is synchronized, loaded to ~~greater than or equal to~~ 3130 kw for diesel generators 1A and 1B and 2600 kw for diesel generator 1C in less than or equal to 60 seconds* and operates with this load for at least 60 minutes.

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

7. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 160 psig.

b. At least once per 24 hours by verifying for diesel generator 1A and 1B that the lube oil circulating pump is operating.

c. By removing accumulated water:

1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and

2) From the storage tank at least once per 31 days.

d e. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:

1) By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:

a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees.

b) A kinematic vicosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.

c) A flash point equal to or greater than 125°F, and

d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.

*The cor tes tes rec eng

2) By verifying that new fuel is added to the storage tanks in accordance with plant operating procedures.

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3 2) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

e At least once every 31 days by obtaining a sample of fuel oil from

2600 kw for diesel generator 1C in less than or equal to 60 seconds* and operates with this load for at least 60 minutes.

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

7. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 160 psig.

b. At least once per 24 hours by verifying for diesel generator 1A and 1B that the lube oil circulating pump is operating.

c. By removing accumulated water:

1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and

2) From the storage tank at least once per 31 days.

d e. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:

1) By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:

a) An API Gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees.

b) A kinematic vicosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.

c) A flash point equal to or greater than 125°F, and

d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.

*The cor tes tes rec eng

2) By verifying that new fuel is added to the storage tanks in accordance with plant operating procedures.

RIVE

3 2) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

e f. At least once every 31 days by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A.

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This may chan
depending on final
of TDI tests

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viscosity @ 40 C of/greater than/or equal to 1.9 but less than or equal to 4.1 when tested in accordance with ASTM-D975-77, and an impurity level of less than 2 mg. of insolubles per 100 ml. when tested in accordance with ASTM-D2274-70, except that the test of new fuel for impurity level shall be performed within 7 days after addition of the new fuel to the storage tank.

f. At least once per 18 months, during shutdown, by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

2. Verifying the diesel generator capability to reject a load of greater than or equal to 917.5 kw for diesel generator 1A, greater than or equal to 509.2 kw for diesel generator 1B, and greater than or equal to 1995 kw for diesel generator 1C while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz while maintaining engine speed to 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is less.

(≤) (1.2)

*The diesel generator start (10 sec) and subsequent loading (60 sec) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts and loading for the purpose of this surveillance testing may be preceded by an engine prelube period and/or other warmup procedure recommended by the manufacturer to minimize mechanical stress and wear on the engine.

See comment by 3/4 7-4

3. Verifying the diesel generator capability to reject a load of 3130 kw for diesel generators 1A and 1B and 2600 kw for diesel generator C without tripping. The generator voltage shall not exceed 4784 volts for diesel generators 1A and 1B or [illegible] volts for diesel generator 1C during and following the load rejection. (4784)

4. Simulating a loss of offsite power by itself, and:

   a) For divisions I and II:

      1) Verifying deenergization of the emergency busses and load shedding from the emergency busses.

      2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the sequencing logic and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± [illegible] Hz during this test. (1.2)

   This may change depending on final resolution of TDI issue

   b) For division III:

      1) Verifying de-energization of the emergency bus.

      2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with the permanently connected loads within 10 seconds and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady state voltage and frequency of the emergency bus shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.

5. Verifying that on an ECCS actuation test signal, without loss of offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± [illegible] Hz within 10 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test. (1.2)

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6. Simulating a loss of offsite power in conjunction with an ECCS actuation test signal, and:

   a) For divisions I and II:

      1) Verifying deenergization of the emergency busses and load shedding from the emergency busses.

      2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds, energizes the auto-connected shutdown loads through the load sequencing logic and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± [illegible] Hz during this test.

      (1.2) See comment pg 3/4 8-5

   b) For division III:

      1) Verifying de-energization of the emergency bus.

      2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with its loads and the auto-connected emergency loads within 10 seconds and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady state voltage and frequency of the emergency bus shall be maintained at 4160 ± 420 volts and 60 ± [illegible] Hz during this test.

      (1.2)

7. Verifying that all automatic diesel generator trips are automatically bypassed upon an ECCS actuation signal except:

   a) For divisions 1 and 2, engine overspeed and generator differential current.

   b) For division 3, engine overspeed and generator differential current.

8. Verifying the diesel generator operates for at least 24 hours. The diesel generators shall be loaded to 3130 kw for diesel generator 1A and 1B and 2600 kw for diesel generator 1C. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± [illegible] Hz within 10 seconds after the start signal; the steady

(1.2) May change

22

Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to ~~greater than or equal to (2-hour rating)~~ kw for 3130 diesel generators (1A) and (1B) and ~~(2-hour rating)~~ kw for diesel 2600 generator (1C). During the remaining 22 hours of this test, 2 the diesel generator shall be loaded to ~~(continuous rating)~~ kw 3130 for diesel generator (1A) and (1B) and ~~(continuous rating)~~ kw 2850 for diesel generator (1C).

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state generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.e.4.a)2) and b)2)*.

9. Verifying that the auto-connected loads to each diesel generator do not exceed [redacted] kw for diesel generator 1A and 1B and 2600 kw for diesel generator 1C. May change 3130

10. Verifying the diesel generator's capability to:

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

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

    c) Be restored to its standby status.

11. Verifying that with the diesel generator operating in a test mode and connected to its bus, a simulated ECCS actuation signal overrides the test mode by (1) returning the diesel generator to standby operation, and (2) automatically energizes the emergency loads with offsite power.

12. Verifying that the automatic load sequence timers are OPERABLE with the interval between each load block within ± 10% of its design interval for diesel generators 1A, 1B and [redacted]. 1C

13. Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:

    a) For Diesel Generators 1A and 1B:
       1) Diesel control panel loss or control power.
       2) Starting air pressure below 50 psi.
       3) Stop solenoid energized.
       4) Diesel in the maintenance mode (includes barring device engaged).
       5) Overspeed trip device actuated.
       6) Generator backup protection lockout relay tripped.

    b) For Diesel Generator 1C:
       1) Diesel generator lockout relays not reset.
       2) Diesel engine mode switch not in "AUTO" position.

*If Surveillance Requirements 4.8.1.1.2.e(4).a)2 and b)2) are not satisfactorily completed, it is not necessary to repeat the preceding 24 hour test. Instead, the diesel generator may be operated at 3130 kw for diesel generators 1A and 1B and 2600 kw for diesel generator 1C for one hour or until operating temperatures have stabilized. May change

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 144 volts, by verifying that:

1. The parameters in Table 4.8.2.1-1 meet the Category B limits,

2. 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. The average electrolyte temperature of at least one out of six 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, free of corrosion and coated with anti-corrosion material,

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

4. The battery charger will supply at least 300 amperes for chargers 1A and 1B and 50 amperes for charger 1C at a minimum of 130.2 volts for at least [illegible] hours.

d. At least once per 18 months, during shutdown, by verifying that either:

1. The battery capacity is adequate to supply and maintain in OPERABLE status all of the actual emergency loads for the design duty cycle when the battery is subjected to a battery service test, or

2. The battery capacity is adequate to supply a dummy load of the following profile in accordance with IEEE 450 while maintaining the battery terminal voltage greater than or equal to 105 volts.

a) Division I

≥ 671 amperes for the first 60 seconds
≥ 270 amperes for the next 9 minutes
≥ 336 amperes for the next 60 seconds
≥ 270 amperes for the next 228 minutes
≥ 451 amperes for the last 60 seconds

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b) Division II

≥ 502 amperes for the first 60 seconds
≥ 261 amperes for the next 9 minutes
≥ 327 amperes for the next 60 seconds
≥ 261 amperes for the next 228 minutes
≥ 327 amperes for the last 60 seconds

c) Division III

≥ 71.4 amperes for the first 60 seconds
≥ 11.1 amperes for the next 239 minutes

} This may change based upon most information from applicant #1

e. At least once per 60 months during shutdown by verifying that the battery capacity is at least 80% 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.

f. At least once per 18 months, during shutdown, 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.

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TABLE 4.8.2.1-1

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A(1)	CATEGORY B(2)	
	Limits for each designated pilot cell	Limits for each connected cell	Allowable(3) value for each connected cell
Electrolyte Level	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(c)	≥ 2.07 volts
Specific Gravity(a)	≥ 1.200(b) (Div. I&II) ≥ ~~1.205~~ 1.195(b) (Div. III)	≥ 1.195 (Div. I&II) ≥ 1.190 (Div. III)	Not more than .020 below the average of all connected cells
	Average of all connected cells		Average of all connected cells
	≥ 1.205 (Div. I&II) ≥ 1.200 (Div. III)		≥ 1.195(b) (Div. I&II) ≥ 1.190(b) (Div. III)

These numbers are acceptable only if manufacturer's recommended full charge specific gravity is 1.210

(a) Corrected for electrolyte temperature and level.
(b) Or battery charging current is less than 2 amperes when on float charge.
(c) May be corrected for average electrolyte temperature.
(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next ~~7~~ 6 days.
(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

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LIMITING CONDITION FOR OPERATION

3.8.3.2 As a minimum, the following power distribution system divisions shall be energized:

a. For A.C. power distribution, Division I or Division II, and when the HPCS system is required to be OPERABLE, Division III, with:

1. Division I consisting of:

a) 4160 volt A.C. bus 1ENS*SWG1A.
b) 480 volt A.C. bus 1EJS*LDC1A and 1EJS*LDC2A.
c) 480 volt A.C. MCCs 1EHS*MCC 2A, 2C, 2E, 2G, 2J, 2L, 8A, 14A, 15A and 16A.
d) 120 volt A.C. distribution panels 1SCV*PNL2A1, 2A2, 2C1, 2E1, 2G1, 2J1, 2L1, 8A1, 14A1, 15A1, and 16A1 in 480 volt MCCs 1EHS*MCC 2A, 2C, 2E, 2G, 2J, 2L, 8A, 14A, 15A and 16A with 1SCM*PNL01A energized from voltage regulating transformer 1SCM*XRC14A1, and 1VBS*PNL01A energized from Uninterruptible Power Supply (UPS) 1ENB*INV01A connected to D.C. Division I# 125 volt D.C. Bus 1ENB*SWG01A and 48 volt A.C. MCCs 1EHS*MCC 8A and 14A.

2. Division II consisting of:

a) 4160 volt A.C. bus 1ENS*SWG1B.
b) 480 volt A.C. bus 1EJS*LDC1B and 1EJS*LDC2B.
c) 480 volt A.C. MCCs 1EHS*MCC 2B, 2D, 2F, 2H, 2K, 8B, 14B, 15B and 16B.
d) 120 volt A.C. distribution panels 1SCV*PNL2B1, 2B2, 2D1, 2F1, 2H1, 2K1, 8B1, 14B1, 15B1 and 16B1 in 480 volt MCCs 1EHS*MCC 2B, 2D, 2F, 2H, 2K, 8B, 14B, 15B and 16B with 1SCM*PNL01B energized from voltage regulating transformer 1SCM*XRC14B1, and 1VBS*PNL01B energized from Uninterruptible Power Supply (UPS) 1ENB*INV01B connected to D.C. Division II# 125 volt D.C. Bus 1ENB*SWG01B and 480 volt A.C. MCCS 1EHS*MCC 8B and 14B.

3. Division III consisting of:

a) 4160 volt A.C. bus 1E22*S004.
b) 480 volt A.C. switchgear 1E22*S002.
c) 120 volt A.C. distribution panel 1E22*S002PNL and 480 volt MCC 1E22*S002.

Not needed as same equipment can stand equalizing charge voltage.

#One UPS may be disconnected from its D.C. source for up to 24 hours for the purpose of performing an equalizing charge on the associated battery bank provided (1) its busses/MCCs/panels are OPERABLE and energized, and (2) the busses/MCCs/panels associated with the other battery banks are OPERABLE and energized from their associated UPS to their associated D.C. bus.

b. For D.C. power distribution, Division I or Division II, and when the HPCS system is required to be OPERABLE, Division III, with:

1. Division I consisting of 125 volt D.C. bus 1ENB*SWG01A and distribution panels 1ENB*PNL02A and 1ENB*PNL03A and MCC 1ENB*MCC1.
2. Division II consisting of 125 volt D.C. bus 1ENB*SWG01B and distribution panels 1ENB*PNL02B and 1ENB*PNL03B.
3. Division III consisting of 25 volt D.C. distribution panel 1E22*S00PNL.

APPLICABILITY: OPERATIONAL CONDITIONS 4, 5 and #.

ACTION:

a. For A.C. power distribution:

1. With less than Division I and/or Division II of the above required A.C. distribution system energized, suspend CORE ALTERATIONS, handling of irradiated fuel in the primary or secondary containment and operations with a potential for draining the reactor vessel.
2. With Division III of the above required A.C. distribution system not energized, declare the HPCS system inoperable and take the ACTION required by Specification 3.5.2 and 3.5.3.

b. For D.C. power distribution:

1. With less than Division I and/or Division II of the above required D.C. distribution system energized, suspend CORE ALTERATIONS, handling of irradiated fuel in the ~~primary or secondary containment~~ Auxiliary Building and Enclosure Building and operations with a potential for draining the reactor vessel.
2. With Division III of the above required D.C. distribution system not energized, declare the HPCS system inoperable and take the ACTION required by Specification 3.5.2 and 3.5.3.

c. The provisions of Specification 3.0.3 are not applicable.

#When handling irradiated fuel in the primary or secondary containment.

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ELECTRICAL POWER SYSTEMS

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

A.C. CIRCUITS INSIDE CONTAINMENT

LIMITING CONDITION FOR OPERATION

3.8.4.1 ~~At least~~ The following A.C. circuits inside containment shall be de-energized*:

a. Circuit numbers (__, __, __ and __) in panel ( ).
b. Circuit numbers (__, __, __ and __) in panel ( ).

I reactor Polar Crane circuit and any other circuits requiring de-energization

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

With any of the above required circuits energized, trip the associated circuit breaker(s) in the specified panel(s) within 1 hour.

SURVEILLANCE REQUIREMENTS

4.8.4.1 Each of the above required A.C. circuits shall be determined to be de-energized at least once per 24 hours** by verifying that the associated circuit breakers are in the tripped condition.

*Except during entry into the containment.
**Except at least once per 31 days if locked, sealed or otherwise secured in the tripped condition.

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3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

PRIMARY CONTAINMENT PENETRATION CONDUCTOR OVERCURRENT PROTECTIVE DEVICES

LIMITING CONDITION FOR OPERATION

3.8.4.2 All primary containment penetration conductor overcurrent protective devices shown in Table 3.8.4.1-1 shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

a. With one or more of the primary containment penetration conductor overcurrent protective devices shown in Table 3.8.4.1-1 inoperable, declare the affected system or component inoperable and apply the appropriate ACTION statement for the affected system and:

   1. For 4.16 kV circuit breakers, de-energize the 4.16 kV circuit(s) by tripping the associated redundant circuit breaker(s) within 72 hours and verify the redundant circuit breaker to be tripped at least once per 7 days thereafter.

   2. For 480 volt circuit breakers, remove the inoperable circuit breaker(s) from service by racking out the breaker within 72 hours and verify the inoperable breaker(s) to be racked out at least once per 7 days thereafter.

   3. For 480 volt MCC circuit breaker/fuse combination starters, remove the inoperable starter(s) from service by locking the breakers open and removing the control power fuse within 72 hours and verify the inoperable starter(s) circuit breaker to be locked open with the control power fuse removed at least once per 7 days thereafter.

   4. For 120 volt circuit breakers, remove the inoperable circuit breaker(s) from service by racking out the breaker within 72 hours and verify the inoperable breaker(s) to be racked out at least once per 7 days thereafter.

   Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. The provisions of Specification 3.0.4 are not applicable to overcurrent devices in 4.16 kV circuits which have their redundant circuit breakers tripped or to 480 or 120 volt circuits which have the inoperable circuit breaker racked out or locked open.

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4.8.4.2 Each of the primary containment penetration conductor overcurrent protective devices shown in Table 3.8.4.1-1 shall be demonstrated OPERABLE:

a. At least once per 18 months:

1. By verifying that the medium voltage 4.16 KV circuit breakers are OPERABLE by selecting, on a rotating basis, at least one of the four circuit breakers and performing:

a) A CHANNEL CALIBRATION of the associated protective relays, and

b) An integrated system functional test which includes simulated automatic actuation of the system and verifying that each relay and associated circuit breakers and overcurrent control circuits function as designed.

c) For each circuit breaker found inoperable during these functional tests, an additional representative sample of at least one of the four circuit breakers of the inoperable type shall also be functionally tested until no more failures are found or all circuit breakers of that type have been functionally tested.

2. By selecting and functionally testing a representative sample of at least 10% of each type of lower voltage circuit breakers. Circuit breakers selected for functional testing shall be selected on a rotating basis. Testing of these circuit breakers shall consist of injecting currents in excess of the breaker's nominal setpoint and measuring the response time. The measured ~~response time~~ shall be compared to the manufacturer's data to ensure that it is less than or equal to a value specified by the manufacturer. Circuit breakers found inoperable during functional testing shall be restored to OPERABLE status prior to resuming operation. For each circuit breaker found inoperable during these functional tests, an additional representative sample of at least 10% of all the circuit breakers of the inoperable type shall also be functionally tested until no more failures are found or all circuit breakers of that type have been functionally tested.

of the long time delay and short time delay trip elements and setpoint of the instantaneous element.

data

3. By selecting and functionally testing a representative sample of at least 10% of each type of motor starter used for penetration redundant overcurrent protection, motor starters selected for functional testing shall be selected on a rotating basis. Testing of these motor starters shall consist of injecting a current with a value equal to the locked rotor current of the associated motor and verifying that the motor starter operates to interrupt the current within the associated thermal overload time delay band width for that current as specified by the manufacturer. Motor starters found inoperable during functional testing shall be restored to OPERABLE status prior to resuming operation. For each motor starter found inoperable during these functional tests, an additional representative sample of at least 10% of all the motor starters of the inoperable type shall also be functionally tested until no more failures are found or all motor starters of that type have been functionally tested.

b. At least once per 60 months by subjecting each circuit breaker to an inspection and preventive maintenance in accordance with procedures prepared in conjunction with its manufacturer's recommendations.

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OTHER OVERCURRENT PROTECTIVE DEVICES

LIMITING CONDITION FOR OPERATION

3.8.4.2 The overcurrent protection devices shown in Table 3.8.4.2-1 shall be OPERABLE.

APPLICABILITY: At all times.

ACTION:

With one or more of the overcurrent protective devices shown in Table 3.8.4.2-1 inoperable, remove the inoperable circuit breaker(s) from service by racking out the breaker within 72 hours and return the breaker(s) to OPERABLE status within 7 days. Otherwise be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.8.4.2 The overcurrent protective devices shall be demonstrated OPERABLE at least once per 18 months by selecting and testing one-half of each type of circuit breaker on a rotating basis. Testing of these circuit breakers shall consist of injecting currents in excess of the breaker's nominal setpoint and measuring the response time. The measured ~~response time~~ data shall be compared to the manufacturer's data to ensure that it is less than or equal to a value specified by the manufacturer.

of the long time delay and short time delay trip elements and setpoint of the instantaneous element.

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REACTOR PROTECTION SYSTEM ELECTRIC POWER MONITORING

LIMITING CONDITION FOR OPERATION

3.8.4.3 Two RPS electric power monitoring channels for the each inservice RPS MG set or alternate power supply shall be OPERABLE.

APPLICABILITY: At all times.

ACTION:

a. With one RPS electric power monitoring channel for an inservice RPS MG set or alternate power supply inoperable, restore the inoperable power monitoring channel to OPERABLE status within 72 hours or remove the associated RPS MG set or alternate power supply from service.

b. With both RPS electric power monitoring channels for an inservice RPS MG set or alternate power supply inoperable, restore at least one electric power monitoring channel to OPERABLE status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.

SURVEILLANCE REQUIREMENTS

4.8.4.3 The above specified RPS electric power monitoring channels shall be determined OPERABLE:

a. At least once per six months by performance of a CHANNEL FUNCTIONAL TEST; and By performance of a CHANNEL FUNCTIONAL TEST each time the unit is in COLD SHUTDOWN for a period of more than 24 hours, unless performed within the previous six months, and

b. At least once per 18 months by demonstrating the OPERABILITY of over-voltage, under-voltage and under-frequency protective instrumentation by performance of a CHANNEL CALIBRATION including simulated automatic actuation of the protective relays, tripping logic and output circuit breakers and verifying the following setpoints.

1. Over-voltage $\leq$ 132 VAC, Bus A, and $\leq$ (132) VAC, Bus B.
2. Under-voltage $\geq$ 108 VAC, Bus A, and $\geq$ (108) VAC, Bus B, and
3. Under-frequency $\geq$ 57 Hz, + 2, - 0%, Bus A and B.

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either de-energizing circuits not required during reactor operation or

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

and Class 1E/non Class 1E interfaces

Containment electrical penetrations, ~~and~~ penetration conductors, are protected by demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers by periodic surveillance.

and/or motor starters

starter

The surveillance requirements applicable to lower voltage circuit breakers ~~and fuses~~ provides assurance of breaker and ~~fuse~~ reliability by testing at least one representative sample of each manufacturers brand of circuit breaker and/or ~~fuse~~. Each manufacturer's molded case and metal case circuit breakers and/or ~~fuses~~ are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers and/or ~~fuses~~ are tested. If a wide variety exists within any manufacturer's brand of circuit breakers and/or ~~fuses~~, it is necessary to divide that manufacturer's breakers and/or ~~fuses~~ into groups and treat each group as a separate type of breaker or ~~fuses~~ for surveillance purposes.

starter → fuse

motor starters → fuses

starters → fuses

motor starters

starters

starter

The reactor protection system (RPS) electric power monitoring assemblies provide redundant protection to the RPS and other systems which receive power from the RPS buses by acting to disconnect the RPS from the power source circuits in the presence of an electrical fault in the power supply.

Specific surveillance tests on the bypass circuits of motor operated valves thermal overload protection is not required at River Bend because the circuits are integral with the starting circuits of the motor operated valves and are, therefore, tested during functional tests of the valves. For the motor operated valve thermal overloads not bypassed, the thermal overloads are tested under Section 4.8.4.2.a.3. These surveillance requirements are in accordance with RG 1.106 "Thermal Overload Protection for Electric Motors on Motor Operated Valves", Revision 1, March 1977.

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