

ATTACHMENT 1

Dresden Station Unit 2

Proposed Changes to DPR-19, Technical Specifications

Revised Pages:

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New Page:

148a

3541N

TABLE 3.2.2 (Cont.)

DPR-19

Min. No. of Operable Inst. Channels per Trip System (1)	Trip Function	Trip Level Setting	Remarks
2	Low Pressure Core Cooling Pump Discharge Pressure	50 psig $\leq p \leq$ 100 psig	Defers APR actuation pending confirmation of low pressure core cooling system operation.
2/Bus	Under Voltage on Emergency Buses	>3092 volts (equals $\frac{3255}{}$ less 5% tolerance)	<ol style="list-style-type: none"> 1. Initiates starting of diesel generators. 2. Permissive for starting ECCS pumps. 3. Removes nonessential loads from buses.
2	Sustained High Reactor Pressure	≤ 1070 psig for 15 seconds	Initiates isolation condenser.
2/Bus	Degraded Voltage on 4 KV Emergency Buses	>3708 volts (equals $\frac{3784}{}$ volts less 2% tolerance) after ≤ 5 minutes (+5% tolerance) with a 7-second (+20%) inherent time delay	Initiates alarm and picks up time delay relay. Diesel generator picks up load if degraded voltage not corrected after time delay.

Notes:

1. For all positions of the Reactor Mode Selector Switch (except for the containment interlock) whenever any ECCS subsystem is required to be operable, there shall be two operable or tripped trip systems. If the first column cannot be met for one of the trip systems, that system shall be tripped. If the first column cannot be met for both trip systems, immediately initiate an orderly shutdown to cold conditions.
2. Need not be operable when primary containment integrity is not required.
3. May be bypassed when necessary during purging for containment inerting or deinerting.
4. If an instrument is inoperable, it shall be placed (or simulated) in the tripped condition so that it will not prevent containment spray.

DPR-19
TABLE 4.2.1

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CORE AND CONTAINMENT COOLING
SYSTEMS INSTRUMENTATION, ROD BLOCKS, AND ISOLATIONS

<u>Instrument Channel</u>	<u>Instrument Functional Test (2)</u>	<u>Calibration (2)</u>	<u>Instrument Check (2)</u>
<u>ECCS INSTRUMENTATION</u>			
1. Reactor Low-Low Water Level	(1)	Once/3 Months	Once/Day
2. Drywell High Pressure	(1)	Once/3 Months	None
3. Reactor Low Pressure	(1)	Once/3 Months	None
4. Containment Spray Interlock			
a. 2/3 Core Height	(1)	Once/3 Months	None
b. Containment High Pressure	(1)	Once/3 Months	None
5. Low Pressure Core Cooling Pump Discharge	(1)	Once/3 Months	None
6. Undervoltage Emergency Bus	Refueling Outage	Refueling Outage	Once/3 Months
7. Degraded Voltage Emergency Bus	Refueling Outage (9)	Refueling Outage	Monthly
8. Sustained High Reactor Pressure	(1)	Once/3 Months	None
<u>ROD BLOCKS</u>			
1. APRM Downscale	(1) (3)	Once/3 Months	None
2. APRM Flow Variable	(1) (3)	Refueling Outage	None
3. APRM Upscale (Startup/Hot Standby)	(2) (3)	(2) (3)	(2)
4. IRM Upscale	(2) (3)	(2) (3)	(2)
5. IRM Downscale	(2) (3)	(2) (3)	(2)
6. IRM detector not fully inserted in the core	(2)	N/A	None
7. RBM Upscale	(1) (3)	Refueling Outage	None
8. RBM Downscale	(1) (3)	Once/3 Months	None
9. SRM Upscale	(2) (3)	(2) (3)	(2)
10. SRM Detector Not in Startup Position	(2) (3)	(2) (3)	(2)
<u>MAIN STEAM LINE ISOLATION</u>			
1. Steam Tunnel High Temperature	Refueling Outage	Refueling Outage	None
2. Steam Line High Flow	(1)	Once/3 Months	Once/Day
3. Steam Line Low Pressure	(1)	Once/3 Months	None
4. Steam Line High Radiation	(1) (3)	Once/3 Months (4)	Once/Day

NOTES:

7. Functional tests will be conducted before startup at the end of each refueling outage or after maintenance is performed on a particular Safety/Relief Valve.
8. If the number of position indicators is reduced to one indication on one or more valves, continued operation is permissible; however, if the reactor is in a shutdown condition, it may not be started up until all position indication is restored. In the event that all position indication is lost on one or more valves and such indication cannot be returned in thirty days, an orderly shutdown shall be initiated, and the reactor shall be depressurized to less than 90 psig in 24 hours.
9. Functional test shall include verification of the second level undervoltage (degraded voltage) timer bypass and shall verify operation of the degraded voltage 5-minute timer and inherent 7-second timer.

3.9 LIMITING CONDITION FOR OPERATION

3.9 AUXILIARY ELECTRICAL SYSTEMSApplicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power during plant operation.

Specification:

- A. The reactor shall not be made critical unless all the following requirements are satisfied:
1. One 138 KV line, associated switchgear, and the reserve auxiliary power transformer capable of carrying power to Unit 2.
 2. The Dresden 2 diesel generator and the Unit 2/3 diesel generator shall be operable.
 3. An additional source of power consisting of one of the following:
 - (a) One other 138 KV line, fully operational and capable of carrying auxiliary power to Unit 2.

4.9 SURVEILLANCE REQUIREMENT

4.9 AUXILIARY ELECTRICAL SYSTEMSApplicability:

Applies to the periodic testing requirements of the auxiliary electrical system.

Objective:

Verify the operability of the auxiliary electrical system.

Specification:

A. Station Batteries

1. Every week the specific gravity and voltage of the pilot cell and temperature of adjacent cells and overall battery voltage shall be measured.
2. Every three months the measurements shall be made of voltage of each cell to nearest 0.01 volt, specific gravity of each cell, and temperature of every fifth cell.
3. Every refueling outage, the station batteries shall be subjected to a rated load discharge test. Determine specific gravity and voltage of each cell after the discharge. If this specification has been complied with for a particular battery for Dresden Unit 3, it shall not be required for Dresden Unit 2.

3.9 LIMITING CONDITION FOR OPERATION

- (b) One 345 KV line from Unit 3 capable of carrying auxiliary power to an essential electrical bus of Unit 2 through the 4160 volt bus tie.
4. (a) 4160 volt buses 23-1 and 24-1 are energized.
- (b) 480 volt buses 28 and 29 are energized.
5. The unit 24/48 volt batteries, the two station 125 volt batteries and the two station 250 volt batteries and a battery charger for each required battery are operable.
- B. Except when the reactor is in the Cold Shut-down or Refueling modes with the head off, the availability of electric power shall be as specified in 3.9.A, except as specified in 3.9.B.1, 3.9.B.2, and 3.9.B.3.
1. From and after the date that incoming power is available from only one line, reactor operation is permissible only during the succeeding seven days unless an additional line is sooner placed in service providing both the Unit 2 and Unit 2/3 emergency diesel generators are operable. From and after the date that incoming power is not available from any line, reactor operation is permissible providing both the Unit 2 and Unit 2/3 emergency diesel generators are operating and all core and containment cooling systems are operable and the AEC is notified within 24 hours of the situation, the precautions to be taken during this situation, and the plans for prompt restoration of incoming power.

4.9 SURVEILLANCE REQUIREMENT

B. Diesel Fuel

Once a month the quantity of diesel fuel available shall be logged.

Once a month a sample of diesel fuel shall be checked for quality.

3.9 LIMITING CONDITION FOR OPERATION

2. From and after the date that one of the diesel generators and/or its associated bus is made or found to be inoperable for any reason, reactor operation is permissible according to Specification 3.5/4.5F and 3.9D only during the succeeding seven days unless such diesel generator and/or bus is sooner made operable, provided that during such seven days the operable diesel generator shall be demonstrated to be operable at least once each day and two off-site lines are available.
3. From and after the date that one of the two 125/250 battery systems is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such battery system is sooner made operable.

C. Diesel Fuel

There shall be a minimum of 10,000 gallons of diesel fuel supply on site for each diesel.

4.9 SURVEILLANCE REQUIREMENT

C. Diesel Generator Operability

1. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue until both the diesel engine and the generator are at equilibrium conditions of temperature while full load output is maintained.
2. During the monthly generator test the diesel starting air compressor shall be checked for operation and its ability to recharge air receivers.
3. During the monthly generator test the diesel fuel oil transfer pumps shall be operated.

3.9 LIMITING CONDITION FOR OPERATION

4.9 SURVEILLANCE REQUIREMENT

D. Diesel Generator Operability

Whenever the reactor is in the Cold Shutdown or Refueling modes, a minimum of one diesel generator (either the Dresden 2 diesel generator or the Unit 2/3 diesel generator) shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required.

4. Additionally, during each refueling outage, a simulated loss of off-site power in conjunction with an ECCS initiation signal test shall be performed on the 4160 volt emergency bus by:

- (a) Verifying de-energization of the emergency buses and load shedding from the emergency buses.
- (b) Verifying the diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer, and operates for ≥ 5 minutes while its generator is loaded with the emergency loads.

4.9 A. Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure.

In addition, the checks described also provide adequate indication that the batteries have the specified ampere hour capability.

- B. The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel would contribute to excessive corrosion of the system causing decreased reliability. The growth of micro-organisms results in slime formations which are one of the chief causes of jelling in hydro-carbon fuels. Minimizing of such slimes is also essential to assuring high reliability.
- C. The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel will be manually started, synchronized to the bus and load picked up. The diesel shall be loaded to at least half load to prevent fouling of the engine. It is expected that the diesel generator will be run for one to two hours. Diesel generator experience at other Commonwealth Edison generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required. In addition, during the test when the generator is synchronized to the

bus, it is also synchronized to the off-site power source and thus not completely independent of this source. To maintain the maximum amount of independence, a thirty-day testing interval is also desirable.

Each diesel generator has two air compressors and four air receiver tanks for starting. It is expected that the air compressors will run only infrequently. During the monthly check of the diesel, the receivers will be drawn down below the point at which the compressor automatically starts to check operation and the ability of the compressors to recharge the receivers. Pressure indicators are provided on each of the receivers.

Following the monthly test of the diesels, the fuel oil day tank will be approximately $\frac{1}{2}$ full based on a two-hour test at full load and 205 gallons per hour at full load. At the end of the monthly load test of the diesel generators, the fuel oil transfer pumps will be operated to refill the day tank and to check the operation of these pumps from the emergency source. The test of the emergency diesel generator during the refueling outage will be more comprehensive in that it will functionally test the system; i.e., it will check diesel starting and closure of diesel breaker and sequencing of loads on the diesel. The diesel will be started by simulation of a loss of coolant accident. In addition, an undervoltage condition will be imposed to simulate a loss of off-site power. The timing sequence will be checked to assure proper loading in the time required. The only load on the diesel is that due to friction and windage and a small amount bypass flow on each pump. Periodic tests between refueling outages verify the ability of the diesel to run at full load and the core and containment cooling pumps to deliver full flow. Periodic testing of the various components plus a functional test at a refueling interval are sufficient to maintain adequate reliability.

ATTACHMENT 2

Dresden Station Unit 3

Proposed Changes to DPR-25, Technical Specifications

Revised Pages:

41
43
45
146
147
148
150

New Page:

148a

3541N

TABLE 3.2.2 (Cont.)

DPR-25

Min. No. of Operable Inst. Channels per Trip System (1)	Trip Function	Trip Level Setting	Remarks
2	Low Pressure Core Cooling Pump Discharge Pressure	50 psig $\leq p \leq$ 100 psig	Defers APR actuation pending confirmation of low pressure core cooling system operation.
2/Bus	Under Voltage on Emergency Buses	>3092 volts (equals 3255 less 5% tolerance)	1. Initiates starting of diesel generators. 2. Permissive for starting ECCS pumps. 3. Removes nonessential loads from buses.
2	Sustained High Reactor Pressure	\leq 1070 psig for 15 seconds	Initiates isolation condenser.
2/Bus	Degraded Voltage on 4 KV Emergency Buses	>3708 volts (equals 3784 volts less 2% tolerance) after \leq 5 minutes (+5% tolerance) with a 7-second (+20%) inherent time delay	Initiates alarm and picks up time delay relay. Diesel generator picks up load if degraded voltage not corrected after time delay.

Notes:

1. For all positions of the Reactor Mode Selector Switch (except for the containment interlock) whenever any ECCS subsystem is required to be operable, there shall be two operable or tripped trip systems. If the first column cannot be met for one of the trip systems, that system shall be tripped. If the first column cannot be met for both trip systems, immediately initiate an orderly shutdown to cold conditions.
2. Need not be operable when primary containment integrity is not required.
3. May be bypassed when necessary during purging for containment inerting or deinerting.
4. If an instrument is inoperable, it shall be placed (or simulated) in the tripped condition so that it will not prevent containment spray.

DPR-25
TABLE 4.2.1

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CORE AND CONTAINMENT COOLING
SYSTEMS INSTRUMENTATION, ROD BLOCKS, AND ISOLATIONS

<u>Instrument Channel</u>	<u>Instrument Functional Test (2)</u>	<u>Calibration (2)</u>	<u>Instrument Check (2)</u>
<u>ECCS INSTRUMENTATION</u>			
1. Reactor Low-Low Water Level	(1)	Once/3 Months	Once/Day
2. Drywell High Pressure	(1)	Once/3 Months	None
3. Reactor Low Pressure	(1)	Once/3 Months	None
4. Containment Spray Interlock			
a. 2/3 Core Height	(1)	Once/3 Months	None
b. Containment High Pressure	(1)	Once/3 Months	None
5. Low Pressure Core Cooling Pump Discharge	(1)	Once/3 Months	None
6. Undervoltage Emergency Bus	Refueling Outage	Refueling Outage	Once/3 Months
7. Degraded Voltage Emergency Bus	Refueling Outage (9)	Refueling Outage	Monthly
8. Sustained High Reactor Pressure	(1)	Once/3 Months	None
<u>ROD BLOCKS</u>			
1. APRM Downscale	(1) (3)	Once/3 Months	None
2. APRM Flow Variable	(1) (3)	Refueling Outage	None
3. APRM Upscale (Startup/Hot Standby)	(2) (3)	(2) (3)	(2)
4. IRM Upscale	(2) (3)	(2) (3)	(2)
5. IRM Downscale	(2) (3)	(2) (3)	(2)
6. IRM detector not fully inserted in the core	(2)	N/A	None
7. RBM Upscale	(1) (3)	Refueling Outage	None
8. RBM Downscale	(1) (3)	Once/3 Months	None
9. SRM Upscale	(2) (3)	(2) (3)	(2)
10. SRM Detector Not in Startup Position	(2) (3)	(2) (3)	(2)
<u>MAIN STEAM LINE ISOLATION</u>			
1. Steam Tunnel High Temperature	Refueling Outage	Refueling Outage	None
2. Steam Line High Flow	(1)	Once/3 Months	Once/Day
3. Steam Line Low Pressure	(1)	Once/3 Months	None
4. Steam Line High Radiation	(1) (3)	Once/3 Months (4)	Once/Day

NOTES:

7. Functional tests will be conducted before startup at the end of each refueling outage or after maintenance is performed on a particular Safety/Relief Valve.
8. If the number of position indicators is reduced to one indication on one or more valves, continued operation is permissible; however, if the reactor is in a shutdown condition, it may not be started up until all position indication is restored. In the event that all position indication is lost on one or more valves and such indication cannot be returned in thirty days, an orderly shutdown shall be initiated, and the reactor shall be depressurized to less than 90 psig in 24 hours.
9. Functional test shall include verification of the second level undervoltage (degraded voltage) timer bypass and shall verify operation of the degraded voltage 5-minute timer and inherent 7-second timer.

3.9 LIMITING CONDITION FOR OPERATION**3.9 AUXILIARY ELECTRICAL SYSTEMS****Applicability:**

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power during plant operation.

Specification:

- A. The reactor shall not be made critical unless all the following requirements are satisfied:
1. One 345 KV line, associated switchgear, and the reserve auxiliary power transformer capable of carrying power to Unit 3.
 2. The Dresden 3 diesel generator and the Unit 2/3 diesel generator shall be operable.
 3. An additional source of power consisting of one of the following:
 - (a) One other 345 KV line, fully operational and capable of carrying auxiliary power to Unit 3.

4.9 SURVEILLANCE REQUIREMENT**4.9 AUXILIARY ELECTRICAL SYSTEMS****Applicability:**

Applies to the periodic testing requirements of the auxiliary electrical system.

Objective:

Verify the operability of the auxiliary electrical system.

Specification:**A. Station Batteries**

1. Every week the specific gravity and voltage of the pilot cell and temperature of adjacent cells and overall battery voltage shall be measured.
2. Every three months the measurements shall be made of voltage of each cell to nearest 0.01 volt, specific gravity of each cell, and temperature of every fifth cell.
3. Every refueling outage, the station batteries shall be subjected to a rated load discharge test. Determine specific gravity and voltage of each cell after the discharge.

3.9 LIMITING CONDITION FOR OPERATION

(b) One 138 KV line from Unit 2 capable of carrying auxiliary power to an essential electrical bus of Unit 3 through the 4160 volt bus tie.

4. (a) 4160 volt buses 33-1 and 34-1 are energized.

(b) 480 volt buses 38 and 39 are energized.

5. The unit 24/48 volt batteries, the two station 125 volt batteries and the two station 250 volt batteries and a battery charger for each required battery are operable.

B. Except when the reactor is in the Cold Shut-down or Refueling modes with the head off, the availability of electric power shall be as specified in 3.9.A, except as specified in 3.9.B.1, 3.9.B.2, and 3.9.B.3.

1. From and after the date that incoming power is available from only one line, reactor operation is permissible only during the succeeding seven days unless an additional line is sooner placed in service providing both the Unit 3 and Unit 2/3 emergency diesel generators are operable. From and after the date that incoming power is not available from any line, reactor operation is permissible providing both the Unit 3 and Unit 2/3 emergency diesel generators are operating and all core and containment cooling systems are operable and the AEC is notified within 24 hours of the situation, the precautions to be taken during this situation, and the plans for prompt restoration of incoming power.

4.9 SURVEILLANCE REQUIREMENT

B. Diesel Fuel

Once a month the quantity of diesel fuel available shall be logged.

Once a month a sample of diesel fuel shall be checked for quality.

3.9 LIMITING CONDITION FOR OPERATION

2. From and after the date that one of the diesel generators and/or its associated bus is made or found to be inoperable for any reason, reactor operation is permissible according to Specification 3.5/4.5F and 3.9D only during the succeeding seven days unless such diesel generator and/or bus is sooner made operable, provided that during such seven days the operable diesel generator shall be demonstrated to be operable at least once each day and two off-site lines are available.
3. From and after the date that one of the two 125/250 battery systems is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless such battery system is sooner made operable.

C. Diesel Fuel

There shall be a minimum of 10,000 gallons of diesel fuel supply on site for each diesel.

4.9 SURVEILLANCE REQUIREMENT**C. Diesel Generator Operability**

1. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue until both the diesel engine and the generator are at equilibrium conditions of temperature while full load output is maintained.
2. During the monthly generator test the diesel starting air compressor shall be checked for operation and its ability to recharge air receivers.
3. During the monthly generator test the diesel fuel oil transfer pumps shall be operated.

3.9 LIMITING CONDITION FOR OPERATION**D. Diesel Generator Operability**

Whenever the reactor is in the Cold Shutdown or Refueling modes, a minimum of one diesel generator (either the Dresden 3 diesel generator or the Unit 2/3 diesel generator) shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required.

4.9 SURVEILLANCE REQUIREMENT

4. Additionally, during each refueling outage, a simulated loss of off-site power in conjunction with an ECCS initiation signal test shall be performed on the 4160 volt emergency bus by:
 - (a) Verifying de-energization of the emergency buses and load shedding from the emergency buses.
 - (b) Verifying the diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer, and operates for ≥ 5 minutes while its generator is loaded with the emergency loads.

- 4.9 A. Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure.

In addition, the checks described also provide adequate indication that the batteries have the specified ampere hour capability.

- B. The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel would contribute to excessive corrosion of the system causing decreased reliability. The growth of micro-organisms results in slime formations which are one of the chief causes of jelling in hydro-carbon fuels. Minimizing of such slimes is also essential to assuring high reliability.
- C. The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel will be manually started, synchronized to the bus and load picked up. The diesel shall be loaded to at least half load to prevent fouling of the engine. It is expected that the diesel generator will be run for one to two hours. Diesel generator experience at other Commonwealth Edison generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required. In addition, during the test when the generator is synchronized to the

bus, it is also synchronized to the off-site power source and thus not completely independent of this source. To maintain the maximum amount of independence, a thirty-day testing interval is also desirable.

Each diesel generator has two air compressors and four air receiver tanks for starting. It is expected that the air compressors will run only infrequently. During the monthly check of the diesel, the receivers will be drawn down below the point at which the compressor automatically starts to check operation and the ability of the compressors to recharge the receivers. Pressure indicators are provided on each of the receivers.

Following the monthly test of the diesels, the fuel oil day tank will be approximately $\frac{1}{2}$ full based on a two-hour test at full load and 205 gallons per hour at full load. At the end of the monthly load test of the diesel generators, the fuel oil transfer pumps will be operated to refill the day tank and to check the operation of these pumps from the emergency source. The test of the emergency diesel generator during the refueling outage will be more comprehensive in that it will functionally test the system; i.e., it will check diesel starting and closure of diesel breaker and sequencing of loads on the diesel. The diesel will be started by simulation of a loss of coolant accident. In addition, an undervoltage condition will be imposed to simulate a loss of off-site power. The timing sequence will be checked to assure proper loading in the time required. The only load on the diesel is that due to friction and windage and a small amount bypass flow on each pump. Periodic tests between refueling outages verify the ability of the diesel to run at full load and the core and containment cooling pumps to deliver full flow. Periodic testing of the various components plus a functional test at a refueling interval are sufficient to maintain adequate reliability.

ATTACHMENT 3

Quad Cities Station Unit 1

Proposed Changes to DPR-29, Technical Specifications

Revised Pages:

3.2/4.2-12

3.2/4.2-13

3.2/4.2-16

3.2/4.2-17

3.9/4.9-1

3.9/4.9-3

3.9/4.9-4

TABLE 3.2.2

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum Number of Operable or Tripped Instrument Channels⁽¹⁾

Minimum Number of Operable or Tripped Instrument Channels ⁽¹⁾	Trip Function	Trip Level Setting	Remarks
4	Reactor low low water level	≥ 84 inches (+ 4 inches/-0 inch) above top of active fuel*	<ol style="list-style-type: none"> 1. In conjunction with low-reactor pressure initiates core spray and LPCI. 2. In conjunction with high-drywell pressure 120-second time delay and low-pressure core cooling interlock initiates auto blowdown. 3. Initiates HPCI and RCIC. 4. Initiates starting of diesel generators.
4 ⁽⁴⁾	High-drywell pressure ^{(2), (3)}	≤ 2 psig	<ol style="list-style-type: none"> 1. Initiates core spray, LPCI, HPCI, and SGTS. 2. In conjunction with low low water level, 120-second time delay, and low-pressure core cooling interlock initiates auto blowdown. 3. Initiates starting of diesel generators. 4. Initiates isolation of control room ventilation.
2	Reactor low pressure	$300 \text{ psig} \leq p \leq 350 \text{ psig}$	<ol style="list-style-type: none"> 1. Permissive for opening core spray and LPCI admission valves. 2. In conjunction with low low reactor water level initiates core spray and LPCI.
2 ⁽³⁾ 4 ⁽³⁾	Containment spray interlock 2/3 core height containment high pressure	$\geq 2/3$ core height $0.5 \text{ psig} \leq p \leq 1.5 \text{ psig}$	Prevents inadvertent operation of containment spray during accident conditions.
2	Timer auto blowdown	≤ 120 seconds	In conjunction with low low reactor water level, high-drywell pressure, and low-pressure core cooling interlock initiates auto blowdown.
4	Low-pressure core cooling pump discharge pressure Undervoltage on emergency buses	$100 \text{ psig} \leq p \leq 150 \text{ psig}$ 3045 + 5% volts	<p>Defers APR actuation pending confirmation of low-pressure core cooling system operation.</p> <ol style="list-style-type: none"> 1. Initiates starting of diesel generators. 2. Permissive for starting ECCS pumps. 3. Removes nonessential loads from buses. 4. Bypasses degraded voltage timer.

*Top of active fuel is defined as 360" above vessel zero for all water levels used in the LOCA analysis.

TABLE 3.2-2 (Cont'd)

Minimum Number of Operable or Tripped Instrument Channels (1)	Trip Function	Trip Level Setting	Remarks
2(5)/Bus	Degraded Voltage on 4 KV Emergency Buses	3840 volts \pm 2% with 5 \pm 5% minute time delay and 7 \pm 20% second inherent time delay	Initiates alarm and picks up time delay relay. Diesel Generator picks up load if degraded voltage not corrected after time delay.

NOTES

1. For all positions of the reactor mode selector switch (except for the containment interlock) whenever any ECCS subsystem is required to be operable, there shall be two operable trip systems. If the first column cannot be met for one or both of the trip systems, the systems actuated shall be declared inoperable and Specifications 3.5 or 3.9 shall govern.
2. Need not be operable when primary containment integrity is not required.
3. If an instrument is inoperable, it shall be placed (or simulated) in the tripped condition so that it will not prevent containment spray.
4. There are a total of eight high drywell pressure sensors. Four are used for core spray and LPCI initiation, and four are used for HPCI and auto blowdown initiation. This specification applies to each set of four sensors.
5. With the number of operable channels one less than the total number of channels, operation may proceed until performance of the next required functional test, provided the inoperable channel is placed in the tripped condition within one hour.

**QUAD-CITIES
DPR-29**

TABLE 4.2-1

**MINIMUM TEST AND CALIBRATION FREQUENCY FOR CORE AND CONTAINMENT COOLING SYSTEMS INSTRUMENTATION,
ROD BLOCKS, AND ISOLATIONS⁽⁷⁾**

Instrument Channel	Instrument Functional Test⁽²⁾	Calibration⁽²⁾	Instrument Check⁽²⁾
ECCS Instrumentation			
1. Reactor low-low water level	(1)	Once/3 months	Once/day
2. Drywell high pressure	(1)	Once/3 months	None
3. Reactor low pressure	(1)	Once/3 months	None
4. Containment spray interlock			
a. 2/3 core height	(1)	Once/3 months	None
b. Containment pressure	(1)	Once/3 months	None
5. Low-pressure core cooling pump discharge	(1)	Once/3 months	None
6. Undervoltage 4-kV essential		Refueling outage	Once/3 months
7. Degraded voltage 4kv essential busses		Refueling Outage	Once/month
Rod Blocks			
1. APRM downscale	(1) (3)	Once/3 months	None
2. APRM flow variable	(1) (3)	Refueling outage	None
3. IRM upscale	(5) (3)	(5) (3)	None
4. IRM downscale	(5) (3)	(5) (3)	None
5. RBM upscale	(1) (3)	Refueling outage	None
6. RBM downscale	(1) (3)	Once/3 months	None
7. SRM upscale	(5) (3)	(5) (3)	None
8. SRM detector not in startup position	(5) (3)	(6)	None
9. IRM detector not in startup position	(5)	(6)	None
10. SRM downscale	(5) (3)	(5) (3)	None
11. High water level in scram discharge volume	Refueling outage	Not applicable	None
Main Steamline Isolation			
1. Steam tunnel high temperature	Refueling outage	Refueling outage	None
2. Steamline high flow	(1)	Once/3 months	Once/day
3. Steamline low pressure	(1)	Once/3 months	None
4. Steamline high radiation	(1) (4)	Refueling outage	Once/day
5. Reactor low low water level	(1)	Once/3 months	Once/day
RCIC Isolation			
1. Steamline high flow	Once/3 months	Once/3 months	None
2. Turbine area high temperature	Refueling outage	Refueling outage	None
3. Low reactor pressure	Once/3 months	Once/3 months	None

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TABLE 4.2-1 (Cont'd)

Instrument Channel	Instrument Functional Test ⁽²⁾	Calibration ⁽²⁾	Instrument Check ⁽²⁾
HPCI Isolation			
1. Steamline high flow	(1)	Once/3 months	None
2. Steamline area high temperature	Refueling outage	Refueling outage	None
3. Low reactor pressure	(1)	Once/3 months	None
Reactor Building Ventilation System Isolation And Standby Treatment System Initiation			
1. Ventilation exhaust duct radiation monitors	(1)	Once/3 months	Once/day
2. Refueling floor radiation monitors	(1)	Once/3 months	Once/day
Steam Jet Air Ejector Off-Gas Isolation			
1. Off-gas radiation monitors	(1) (4)	Refueling outage	Once/day
Control Room Ventilation System Isolation			
1. Reactor low water level	(1)	Once/3 months	Once/day
2. Drywell high pressure	(1)	Once/3 months	None
3. Main steamline high flow	(1)	Once/3 months	Once/day
4. Ventilation exhaust duct radiation monitors	(1)	Once/3 months	Once/day

Notes

1. Initially once per month until exposure hours (M as defined on Figure 4.1-1) are 2.0×10^5 ; thereafter, according to Figure 4.1-1 with an interval not less than 1 month nor more than 3 months. The compilation of instrument failure rate data may include data obtained from other boiling water reactors for which the same design instrument operates in an environment similar to that of Quad-Cities Units 1 and 2.
2. Functional tests, calibrations, and instrument checks are not required when these instruments are not required to be operable or are tripped.
3. This instrumentation is excepted from the functional test definition. The functional test shall consist of injecting a simulated electrical signal into the measurement channel.
4. This instrument channel is excepted from the functional test definitions and shall be calibrated using simulated electrical signals once every 3 months.
5. Functional tests shall be performed before each startup with a required frequency not to exceed once per week. Calibrations shall be performed during each startup or during controlled shutdowns with a required frequency not to exceed once per week.
6. The positioning mechanism shall be calibrated every refueling outage.
7. Logic system functional tests are performed as specified in the applicable section for these systems.
8. Functional test shall include verification of operation of the degraded voltage 5-minute timer and 7-second inherent timer.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEMS

LIMITING CONDITIONS FOR OPERATION

Applicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power during plant operation.

SURVEILLANCE REQUIREMENTS

Applicability:

Applies to the periodic testing requirement of the auxiliary electrical system.

Objective:

To verify the operability of the auxiliary electrical system.

SPECIFICATIONS

A. Normal and Emergency A-C Auxiliary Power

The reactor shall not be made critical unless all the following requirements are satisfied.

1. The Unit diesel generator and the Unit 1/2 diesel generator shall be operable.

2. One 345-kV line, associated switchgear, and the reserve auxiliary power transformer capable of carrying power.

A. Normal and Emergency A-C Auxiliary Power

1. a. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue until both the diesel engine and the generator are at equilibrium conditions of temperature while full load output is maintained.
b. During the monthly generator test, the diesel-starting air compressor shall be checked for operation and its ability to recharge air receivers.
c. During the monthly generator test, the diesel fuel oil transfer pumps shall be operated.

2. The status of the 345-kV lines, associated switchgear, and the reserve auxiliary power transformer shall be

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unless an additional line is sooner placed in service, providing both the Unit and Unit 1/2 emergency diesel generators are operable.

2. From and after the date the incoming power is not available from any line, continued reactor operation is permissible providing both the Unit and Unit 1/2 emergency diesel generators are operating, all core and containment cooling systems are operable, reactor power level is reduced to 40% of rated, and the NRC is notified within 24 hours of the situation, the precautions to be taken during this period, and the plans for prompt restoration of incoming power.
3. From and after the date that one of the two 125/250-volt battery systems is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 3 days unless such battery system is sooner made operable.

D. Diesel Fuel

There shall be a minimum of 10,000 gallons of diesel fuel supply on site for each diesel generator.

D. Diesel Fuel

Once a month the quantity of diesel fuel available shall be logged.

Once a month a sample of diesel fuel shall be checked for quality.

E. Diesel-Generator Operability

1. Whenever the reactor is in the Startup/Hot Standby or Run mode and the unit or shared diesel generators and/or their respective associated buses are made or found to be inoperable for any reason, except as specified in Specification 3.9.E.2 below, continued reactor operation is permissible only during the succeeding 7 days provided that all of the low-pressure core cooling and all loops of the containment cooling mode of the RHR system associated with the operable diesel generator shall be operable, and two offsite lines are available. If this requirement cannot be met, an orderly shutdown shall be initiated and the

E. Diesel-Generator Operability

1. When it is determined that either the unit or shared diesel generator is inoperable, all low-pressure core cooling systems and all loops of the containment cooling modes of the RHR system associated with the operable diesel generator shall be demonstrated to be operable immediately and daily thereafter. The operable diesel generator shall be demonstrated to be operable immediately and daily thereafter.

2. During each refueling outage, a simulated loss of off-site power in conjunction with an ECCS initiation signal test shall be performed on the 4160 volt emergency bus by:

- reactor shall be in the cold shutdown condition within 24 hours.
2. Specification 3.9.E.1 shall not apply when a diesel generator has been made inoperable for a period not to exceed 1-1/2 hours for the purpose of conducting preventative maintenance. Additionally, preventative maintenance shall not be undertaken unless two off site lines are available and the alternate diesel generator has been demonstrated to be operable.
 3. Whenever the reactor is in the Cold Shutdown or Refueling mode, a minimum of one diesel generator (either the Unit diesel generator or the Unit 1/2 diesel generator) shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required.
 - a. Verifying de-energization of the emergency buses, and load shedding from the emergency buses.
 - b. Verifying the diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer, and operates for greater than 5 minutes while its generator is loaded with the emergency loads.

ATTACHMENT 4

Quad Cities Station Unit 2

Proposed Changes to DPR-30, Technical Specifications

Revised Pages:

3.2/4.2-12

3.2/4.2-13

3.2/4.2-16

3.2/4.2-17

3.9/4.9-1

3.9/4.9-3

3.9/4.9-4

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TABLE 3.2-2

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum Number
of Operable or
Tripped Instrument
Channels⁽¹⁾

Minimum Number of Operable or Tripped Instrument Channels ⁽¹⁾	Trip Function	Trip Level Setting	Remarks
4	Reactor low water level	≥ 84 inches (+ 4 inches/- 0 inch) above top of active fuel*	<ol style="list-style-type: none"> 1. In conjunction with low-reactor pressure initiates core spray and LPCI. 2. In conjunction with high-drywell pressure 120-second time delay and low-pressure core cooling interlock initiates auto blowdown. 3. Initiates HPCI and RCIC. 4. Initiates starting of diesel generators.
4 ⁽⁴⁾	High-drywell pressure ^{(2), (3)}	≤ 2 psig	<ol style="list-style-type: none"> 1. Initiates core spray, LPCI, HPCI, and SGTS. 2. In conjunction with low low water level, 120-second time delay, and low-pressure core cooling interlock initiates auto blowdown. 3. Initiates starting of diesel generators. 4. Initiates isolation of control room ventilation.
2	Reactor low pressure	$300 \text{ psig} \leq p \leq 350 \text{ psig}$	<ol style="list-style-type: none"> 1. Permissive for opening core spray and LPCI admission valves. 2. In conjunction with low low reactor water level initiates core spray and LPCI.
2 ⁽³⁾ 4 ⁽³⁾	Containment spray interlock 2/3 core height containment high pressure	$\geq 2/3$ core height $0.5 \text{ psig} \leq p \leq 1.5 \text{ psig}$	Prevents inadvertent operation of containment spray during accident conditions.
2	Timer auto blowdown	≤ 120 seconds	In conjunction with low low reactor water level, high-drywell pressure, and low-pressure core cooling interlock initiates auto blowdown.
4	Low-pressure core cooling pump discharge pressure	$100 \text{ psig} \leq p \leq 150 \text{ psig}$	Defers APR actuation pending confirmation of low-pressure core cooling system operation.
2/BUS ⁽⁵⁾	Undervoltage on emergency buses	3045 + 58 volts	<ol style="list-style-type: none"> 1. Initiates starting of diesel generators. 2. Permissive for starting ECCS pumps. 3. Removes nonessential loads from buses. 4. Bypasses degraded voltage timer.

*Top of active fuel is defined as 360" above vessel zero for all water levels used in the LOCA analysis.

TABLE 3.2-2 (Cont'd)

Minimum Number of Operable or Tripped Instrument Channels (1)	Trip Function	Trip Level Setting	Remarks
2(5)/Bus	Degraded Voltage on 4 KV Emergency Buses	3840 volts \pm 2% with 5 \pm 5% minute time delay and 7 \pm 20% second inherent time delay	Initiates alarm and picks up time delay relay. Diesel Generator picks up load if degraded voltage not corrected after time delay.

NOTES

1. For all positions of the reactor mode selector switch (except for the containment interlock) whenever any ECCS subsystem is required to be operable, there shall be two operable trip systems. If the first column cannot be met for one or both of the trip systems, the systems actuated shall be declared inoperable and Specifications 3.5 or 3.9 shall govern.
2. Need not be operable when primary containment integrity is not required.
3. If an instrument is inoperable, it shall be placed (or simulated) in the tripped condition so that it will not prevent containment spray.
4. There are a total of eight high drywell pressure sensors. Four are used for core spray and LPCI initiation, and four are used for HPCI and auto blowdown initiation. This specification applies to each set of four sensors.
5. With the number of operable channels one less than the total number of channels, operation may proceed until performance of the next required functional test, provided the inoperable channel is placed in the tripped condition within one hour.

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TABLE 4.2-1

**MINIMUM TEST AND CALIBRATION FREQUENCY FOR CORE AND CONTAINMENT COOLING SYSTEMS INSTRUMENTATION,
ROD BLOCKS, AND ISOLATIONS⁽⁷⁾**

Instrument Channel	Instrument Functional Test ⁽²⁾	Calibration ⁽²⁾	Instrument Check ⁽²⁾
ECCS Instrumentation			
1. Reactor low-low water level	(1)	Once/3 months	Once/day
2. Drywell high pressure	(1)	Once/3 months	None
3. Reactor low pressure	(1)	Once/3 months	None
4. Containment spray interlock			
a. 2/3 core height	(1)	Once/3 months	None
b. Containment pressure	(1)	Once/3 months	None
5. Low-pressure core cooling pump discharge	(1)	Once/3 months	None
6. Undervoltage 4-kv essential		Once/3 months	
7. Degraded voltage 4kv essential buses		Once/month	
Rod Block			
1. APRM downscale	(1) (3)	Once/3 months	None
2. APRM flow variable	(1) (3)	Refueling outage	None
3. IRM upscale	(5) (3)	(5) (3)	None
4. IRM downscale	(5) (3)	(5) (3)	None
5. RBM upscale	(1) (3)	Refueling outage	None
6. RBM downscale	(1) (3)	Once/3 months	None
7. SRM upscale	(5) (3)	(5) (3)	None
8. SRM detector not in startup position	(5) (3)	(6)	None
9. IRM detector not in startup position	(5)	(6)	None
10. SRM downscale	(5) (3)	(5) (3)	None
11. High water level in scram discharge volume	Refueling outage	Not applicable	None
Main Steamline Isolation			
1. Steam tunnel high temperature	Refueling outage	Refueling outage	None
2. Steamline high flow	(1)	Once/3 months	Once/day
3. Steamline low pressure	(1)	Once/3 months	None
4. Steamline high radiation	(1) (4)	Refueling outage	Once/day
5. Reactor low low water level	(1)	Once/3 months	Once/day
RCIC Isolation			
1. Steamline high flow	Once/3 months	Once/3 months	None
2. Turbine area high temperature	Refueling outage	Refueling outage	None
3. Low reactor pressure	Once/3 months	Once/3 months	None

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TABLE 4.2-1 (Cont'd)

Instrument Channel	Instrument Functional Test ⁽²⁾	Calibration ⁽²⁾	Instrument Check ⁽²⁾
HPCI Isolation			
1. Steamline high flow	(1)	Once/3 months	None
2. Steamline area high temperature	Refueling outage	Refueling outage	None
3. Low reactor pressure	(1)	Once/3 months	None
Reactor Building Ventilation System Isolation And Standby Treatment System Initiation			
1. Ventilation exhaust duct radiation monitors	(1)	Once/3 months	Once/day
2. Refueling floor radiation monitors	(1)	Once/3 months	Once/day
Steam Jet Air Ejector Off-Gas Isolation			
1. Off-gas radiation monitors	(1) (4)	Refueling outage	Once/day
Control Room Ventilation System Isolation			
1. Reactor low water level	(1)	Once/3 months	Once/day
2. Drywell high pressure	(1)	Once/3 months	None
3. Main steamline high flow	(1)	Once/3 months	Once/day
4. Ventilation exhaust duct radiation monitors	(1)	Once/3 months	Once/day

Notes

1. Initially once per month until exposure hours (M as defined on Figure 4.1-1) are 2.0×10^5 ; thereafter, according to Figure 4.1-1 with an interval not less than 1 month nor more than 3 months. The compilation of instrument failure rate data may include data obtained from other boiling water reactors for which the same design instrument operates in an environment similar to that of Quad-Cities Units 1 and 2.
2. Functional tests, calibrations, and instrument checks are not required when these instruments are not required to be operable or are tripped.
3. This instrumentation is excepted from the functional test definition. The functional test shall consist of injecting a simulated electrical signal into the measurement channel.
4. This instrument channel is excepted from the functional test definitions and shall be calibrated using simulated electrical signals once every 3 months.
5. Functional tests shall be performed before each startup with a required frequency not to exceed once per week. Calibrations shall be performed during each startup or during controlled shutdowns with a required frequency not to exceed once per week.
6. The positioning mechanism shall be calibrated every refueling outage.
7. Logic system functional tests are performed as specified in the applicable section for these systems.
8. Functional test shall include verification of operation of the degraded voltage 5-minute timer and 7-second inherent timer.

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3.9/4.9 AUXILIARY ELECTRICAL SYSTEMS

LIMITING CONDITIONS FOR OPERATION

Applicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power during plant operation.

SURVEILLANCE REQUIREMENTS

Applicability:

Applies to the periodic testing requirement of the auxiliary electrical system.

Objective:

To verify the operability of the auxiliary electrical system.

SPECIFICATIONS

A. Normal and Emergency A-C Auxiliary Power

The reactor shall not be made critical unless all the following requirements are satisfied.

1. The Unit diesel generator and the Unit 1/2 diesel generator shall be operable.

A. Normal and Emergency A-C Auxiliary Power

1. a. Each diesel generator shall be manually started and loaded once each month to demonstrate operational readiness. The test shall continue until both the diesel engine and the generator are at equilibrium conditions of temperature while full load output is maintained.
- b. During the monthly generator test, the diesel-starting air compressor shall be checked for operation and its ability to recharge air receivers.
- c. During the monthly generator test, the diesel fuel oil transfer pumps shall be operated,

2. One 345-kV line, associated switchgear, and the reserve auxiliary power transformer capable of carrying power

2. The status of the 345-kV lines, associated switchgear, and the reserve auxiliary power transformer shall be

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unless an additional line is sooner placed in service, providing both the Unit and Unit 1/2 emergency diesel generators are operable.

2. From and after the date the incoming power is not available from any line, continued reactor operation is permissible providing both the Unit and Unit 1/2 emergency diesel generators are operating, all core and containment cooling systems are operable, reactor power level is reduced to 40% of rated, and the NRC is notified within 24 hours of the situation, the precautions to be taken during this period, and the plans for prompt restoration of incoming power.
3. From and after the date that one of the two 125/250-volt battery systems is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 3 days unless such battery system is sooner made operable.

D. Diesel Fuel

There shall be a minimum of 10,000 gallons of diesel fuel supply on site for each diesel generator.

E. Diesel-Generator Operability

1. Whenever the reactor is in the Startup/Hot Standby or Run mode and the unit or shared diesel generators and/or their respective associated buses are made or found to be inoperable for any reason, except as specified in Specification 3.9.E.2 below, continued reactor operation is permissible only during the succeeding 7 days provided that all of the low-pressure core cooling and all loops of the containment cooling mode of the RHR system associated with the operable diesel generator shall be operable, and two offsite lines are available. If this requirement cannot be met, an orderly shutdown shall be initiated and the

D. Diesel Fuel

Once a month the quantity of diesel fuel available shall be logged.

Once a month a sample of diesel fuel shall be checked for quality.

E. Diesel-Generator Operability

1. When it is determined that either the unit or shared diesel generator is inoperable, all low-pressure core cooling systems and all loops of the containment cooling modes of the RHR system associated with the operable diesel generator shall be demonstrated to be operable immediately and daily thereafter. The operable diesel generator shall be demonstrated to be operable immediately and daily thereafter.
2. During each refueling outage, a simulated loss of off-site power in conjunction with an ECCS initiation signal test shall be performed on the 4160 volt emergency bus by:

reactor shall be in the cold shutdown condition within 24 hours.

2. Specification 3.9.E.1 shall not apply when a diesel generator has been made inoperable for a period not to exceed 1-1/2 hours for the purpose of conducting preventative maintenance. Additionally, preventative maintenance shall not be undertaken unless two off site lines are available and the alternate diesel generator has been demonstrated to be operable.
3. Whenever the reactor is in the Cold Shutdown or Refueling mode, a minimum of one diesel generator (either the Unit diesel generator or the Unit 1/2 diesel generator) shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required.
 - a. Verifying de-energization of the emergency buses, and load shedding from the emergency buses.
 - b. Verifying the diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer, and operates for greater than 5 minutes while its generator is loaded with the emergency loads.