2.12 Station Electrical Systems

2.12.1 Electrical Power Distribution System

Design Description

The AC Electrical Power Distribution (EPD) System consists of the transmission network (TN), the plant switching stations, the Main Power Transformer (MPT), the Unit Auxiliary Transformers (UAT), the Reserve Auxiliary Transformer(s) (RAT(s)), the plant main generator (PMG) output circuit breaker, the medium voltage metal-clad (M/C) switchgear, the low voltage power center (P/C) switchgear, and the motor control centers (MCCs). The distribution system also includes the power, instrumentation and control cables and bus ducts to the distribution system loads, and the protection equipment provided to protect the distribution system equipment. The EPD System within the scope of the Certified Design starts at the low voltage terminals of the MPT and the low voltage terminals of the RAT(s) and ends at the distribution system loads. Interface requirements for the TN, plant switching stations, MPT, and RAT(s) are specified below.

The plant EPD System can be supplied power from multiple power sources; these are independent transmission lines from the TN, the PMG, and the combustion turbine generator (CTG). In addition, the EPD System can be supplied from three onsite Class 1E Standby Power Sources (Emergency Diesel Generators (DGs)). The Class 1E portion of the EPD System is shown in Figure 2.12.1.

During plant power operation, the PMG supplies power through the PMG output circuit breaker through the MPT to the TN, and to the UATs. When the PMG output circuit breaker is open, power is backfed from the TN through the MPT to the UATs.

The UATs can supply power to the non-Class 1E load groups of medium voltage M/C power generation (PG) and plant investment protection (PIP) switchgear, and to the three Class 1E divisions (Division I, II, and III) of medium voltage M/C switchgear.

The RAT(s) can supply power to the non-Class 1E load groups of medium voltage M/C PG and PIP switchgear, and to the three Class 1E divisions (Division I, II, and III) of medium voltage M/C switchgear.

Non-Class 1E load groups of medium voltage M/C switchgear are supplied power from a UAT with an alternate power supply from a RAT. In addition, the non-Class 1E medium voltage M/C switchgear can be supplied power from the CTG.

Class 1E medium voltage M/C switchgear are supplied power directly (not through any bus supplying non-Class 1E loads) from at least a UAT or a RAT. Class 1E medium voltage M/C switchgear can also be supplied power from their own dedicated Class 1E DG or from the non-Class 1E CTG.

The UATs are sized to supply their load requirements, during design operating modes, of their respective Class 1E divisions and non-Class 1E load groups. UATs are separated from the RAT(s). In addition, UATs are provided with their own oil pit, drain, fire deluge system, grounding, and lightning protection system.

The PMG, its output circuit breaker, and UAT power feeders are separated from the RAT(s) power feeders. The PMG, its output circuit breaker, and UAT instrumentation and control circuits, are separated from the RAT(s) instrumentation and control circuits.

The MPT and its switching station instrumentation and control circuits, from the switchyard(s) to the main control room (MCR), are separated from the RAT(s) and its switching station instrumentation and control circuits.

The medium voltage M/C switchgear and low voltage P/C switchgear, with their respective transformers, and the low voltage MCCs are sized to supply their load requirements. M/C and P/C switchgear, with their respective transformers, and MCCs are rated to withstand fault currents for the time required to clear the fault from the power source. The PMG output circuit breaker, and power feeder and load circuit breakers for the M/C and P/C switchgear, and MCCs are sized to supply their load requirements and are rated to interrupt fault currents.

Class 1E equipment is protected from degraded voltage conditions.

EPD System interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest to the fault opens before other devices. For instances where coordination cannot be practically achieved, analysis will justify the lack of coordination.

Instrumentation and control power for the Class 1E divisional medium voltage M/C switchgear and low voltage P/C switchgear is supplied from the Class 1E DC power system in the same division.

The PMG output circuit breaker is equipped with redundant trip devices which are supplied from separate, non-Class 1E DC power systems.

EPD System cables and bus ducts are sized to supply their load requirements and are rated to withstand fault currents for the time required to clear the fault from its power source.

For the EPD System, Class 1E power is supplied by three independent Class 1E divisions. Independence is maintained between Class 1E divisions, and also between Class 1E divisions and non-Class 1E equipment.

The only non-Class 1E loads connected to the Class 1E EPD System are the Fine Motion Control Rod Drives (FMCRDs) and the associated AC standby lighting system.

There are no automatic connections between Class 1E divisions.

Class 1E medium voltage M/C switchgear and low voltage P/C switchgear and MCCs are identified according to their Class 1E division. Class 1E M/C and P/C switchgear and MCCs are located in Seismic Category I structures, and in their respective divisional areas.

Class 1E EPD System cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.

Harmonic Distortion waveforms do not prevent Class 1E equipment from performing their safety functions.

The EPD System supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.

An electrical grounding system is provided for (1) instrumentation, control, and computer systems, (2) electrical equipment (switchgear, distribution panels, transformers, and motors) and (3) mechanical equipment (fuel and chemical tanks). Lightning protection systems are provided for buildings and for structures and transformers located outside of the buildings. Each grounding system and lightning protection system is separately grounded to the plant grounding grid.

The EPD System has the following alarms, displays and controls in the MCR:

(1) Alarms for degraded voltage on Class 1E medium voltage M/C switchgear.

(2) Parameter displays for PMG output voltage, amperes, watts, vars, and frequency.

(3) Parameter displays for EPD System medium voltage M/C switchgear bus voltages and feeder and load amperes.

(4) Controls for the PMG output circuit breaker, medium voltage M/C switchgear feeder circuit breakers, load circuit breakers from the medium voltage M/C switchgear to their respective low voltage P/C switchgear, and low voltage feeder circuit breakers to the low voltage P/C switchgear.

(5) Status indication for the PMG output circuit breaker and the medium voltage M/C switchgear circuit breakers.

The EDP System has the following displays and controls at the Remote Shutdown System (RSS):

(1) Parameter displays for the bus voltages on the Class 1E Divisions I and II medium voltage M/C switchgear.

(2) Controls and status indication for the UAT, RAT(s), CTG and DG Class 1E feeder circuit breakers to the Division I and II medium voltage M/C switchgear, the load circuit breakers from the Class 1E Division I and II medium voltage M/C switchgear to their respective low voltage P/C switchgear, and the low voltage feeder circuit breakers to the Class 1E Division I and II low voltage P/C switchgear.

Class 1E equipment is classified as Seismic Category I.

Class 1E equipment which is located in areas designated as harsh environment areas is qualified for harsh environments.

Interface Requirements

The portions of the EPD System which are not part of the Certified Design shall meet the following requirements:

The offsite system shall consist of a minimum of two independant offsite transmission circuits from the TN.

Voltage variations of the offsite TN during steady state operation shall not cause voltage variations at the loads of more than plus or minus 10% of the loads nominal ratings.

The normal steady state frequency of the offsite TN shall be within plus or minus 2 hertz of 60 hertz during recoverable periods of system instability.

The offsite transmission circuits from the TN through and including the main step-up power transformers and RAT(s) shall be sized to supply their load requirements, during all design operating modes, of their respective Class 1E divisions and non-Class 1E load groups.

The impedances of the main step-up power transformers and RAT(s) shall be compatible with the interrupting capability of the plant's circuit interrupting devices.

The independence of offsite transmission power, instrumentation, and control circuits shall be compatible with the portion of the offsite transmission power, instrumentation, and control circuits within the DCD design scope.

Instrumentation and control system loads shall be compatible with the capacity and capability design requirements of DC systems within the DCD design scope.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.1 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the EPD System.

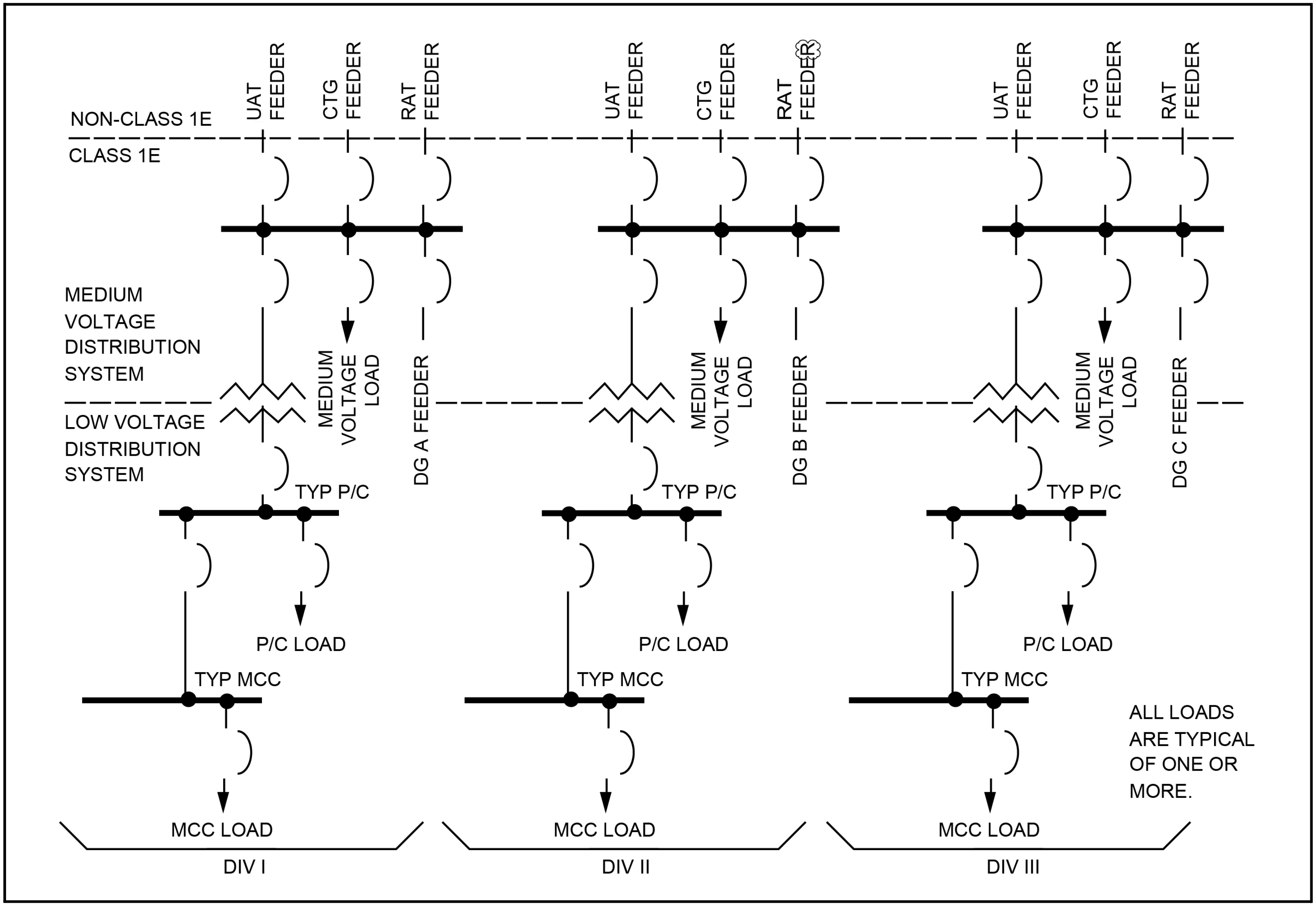


Figure 2.12.1 Class 1E Electrical Power Distribution System

Table 2.12.1 Electric Power Distribution System

Inspections, Tests, Analyses and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration for the EPD System is described in Section 2.12.1.	1. Inspection of the as-built system will be conducted.	1. The as-built EPD System conforms with the basic configuration described in Section 2.12.1.
2. UATs are sized to supply their load requirements, during design operating modes, of their respective Class 1E divisions and non-Class 1E load groups.	2. Analyses for the as-built UATs to determine their load requirements will be performed.	2. Analyses for as-built UATs exist and conclude that UAT capacity, as determined by its nameplate rating, exceeds its analyzed load requirements, during design operating modes, for its Class 1E division and non-Class 1E load group.
3. UATs are separated from the RAT(s).	3. Inspections of the as-built UATs will be conducted.	3. As-built UATs are separated from the RAT(s) by a minimum of 15.24m.
4. UATs are provided with their own oil pit, drain, fire deluge system, grounding, and lightning protection systems.	4. Inspections of the as-built UATs will be conducted.	4. As-built UATs are provided with their own oil pit, drain, fire deluge system, grounding, and lightning protection systems.
5. The PMG and its output circuit breaker is separated from the RAT(s) power feeders. The PMG and its output circuit breaker instrument and control circuits are separated from the RAT(s) instrumentation and control circuits.	5. Inspections for the as-built PMG, the PMG output circuit breaker, the RAT(s) and their respective instrumentation and control circuits will be conducted.	5. As-built PMG and its output circuit breaker is separated from the RAT(s) power feeders by a minimum of 15.24m, or by walls or floors. The PMG and its output circuit breaker instrument and control circuits are separated from the RAT(s) instrumentation and control circuits by a minimum of 15.24m, or by walls or floors outside the MCR, and are separated by routing the circuits in separate raceways inside the MCR.

Table 2.12.1 Electric Power Distribution System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. UATs power feeders, and instrumentation and control circuits are separated from the RAT(s) output power feeders, and instrumentation and control circuits.	6. Inspections for the as-built UATs and RAT(s) power feeders, and instrumentation and control circuits will be conducted.	6. As-built UAT power feeders are separated from the RAT(s) power feeders by a minimum of 15.24m, or by walls or floors, except at the switchgear, where they are routed to opposite ends of the medium voltage M/C switchgear. As-built UAT instrumentation and control circuits, are separated from the RAT(s) instrumentation and control circuits by a minimum of 15.24m, or by walls or floors, except as follows: a) at the non-Class 1E DC power sources, where they are routed in separate raceways, b) inside the MCR, where they are separated by routing the circuits in separate raceways, and c) at the switchgear, where they are routed to opposite ends of the medium voltage M/C switchgear and routed in separate raceways inside the switchgear.
7. The MPT and its switching station instrumentation and control circuits are separated from the RAT(s) and its switching station instrumentation and control circuits.	7. Inspections for the as-built MPT and RAT(s) and their respective switching station instrumentation and control circuits will be conducted.	7. As-built MPT and its switching station instrumentation and control circuits, from the switchyard(s) to the MCR, are separated from the RAT(s) and its switching station instrumentation and control circuits by a minimum of 15.24m, or by walls or floors. MPT and its switching station instrumentation and control circuits, inside the MCR, are separated from the RAT(s) and its switching station instrumentation and control circuits by routing the circuits in separate raceways.

Table 2.12.1 Electric Power Distribution System (Continued)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. Medium voltage M/C switchgear, low voltage P/C switchgear, with their respective transformers, and MCCs, and their respective switchgear and MCC feeder and load circuit breakers are sized to supply their load requirements.	8. Analyses for the as-built EPD System to determine load requirements will be performed.	8. Analyses for the as-built EPD System exist and conclude that the capacities of the Class 1E switchgear, P/C transformers, MCCs, and their respective feeder and load circuit breakers, as determined by their nameplate ratings, exceed their analyzed load requirements.
9.	9.	9.
a. Medium voltage M/C switchgear, low voltage P/C switchgear, with their respective transformers, and MCCs, are rated to withstand fault currents for the time required to clear the fault from its power source.	a. Analyses for the as-built EPD System to determine fault currents will be performed.	a. Analyses for the as-built EPD System exist and conclude that the Class 1E switchgear, with their respective transformers, and MCC, current capacities exceed their analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the fault from its power source.
b. The PMG output circuit breaker, medium voltage M/C switchgear, low voltage P/C switchgear and MCC feeder and load circuit breakers are rated to interrupt fault currents	b. Analyses for the as-built EPD System to determine fault currents will be performed.	b. Analyses for the as-built EPD System exist and conclude that the analyzed fault currents do not exceed the PMG output circuit breaker, and M/C, P/C switchgear, and MCC feeder and load circuit breakers interrupt capacities, as determined by their nameplating ratings.

Table 2.12.1 Electric Power Distribution System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
10. Class 1E equipment is protected from degraded voltage conditions.	10. a. Analyses for the as-built EPD System to determine the trip conditions for degraded voltage conditions will be performed. b. Tests for each as-built Class 1E M/C switchgear will be conducted by providing a simulated degraded voltage signal.	10. a. Analyses for the as-built EPD System exist and conclude that the Class 1E preferred offsite power feeder breakers to the Class 1E M/C switchgear will trip before Class 1E loads experience degraded voltage conditions exceeding those voltage conditions for which the Class 1E equipment is qualified. b. As-built Class 1E feeder breakers from preferred offsite power to the Class 1E M/C switchgear trip when a degraded voltage condition exists.
11. EPD System interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest to the fault opens before other devices.	11. Analyses for the as-built EPD System to determine circuit interrupting device coordination will be performed.	11. Analyses for the as-built EPD System exist and conclude that, to the maximum extent possible, the analyzed circuit interrupter closest to the fault will open before other devices. For instances where coordination cannot be practically achieved, the analysis will justify the lack of coordination.
12. Instrumentation and control power for Class 1E divisional medium voltage M/C switchgear and low voltage P/C switchgear is supplied from the Class 1E DC power system in the same division.	12. Tests of the as-built Class 1E medium and low voltage switchgear will be conducted by providing a test signal in only one Class 1E division at a time.	12. A test signal exists in only the Class 1E division under test.
13. The PMG output circuit breaker is equipped with redundant trip devices which are supplied from separate non-Class 1E DC power systems.	13. Tests of the as-built PMG output circuit breaker will be conducted by providing a test signal in only one trip circuit at a time.	13. A test signal exists in only the circuit under test.

Table 2.12.1 Electric Power Distribution System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
14. EPD System cables and bus ducts are sized to supply their load requirements.	14. Analyses for the as-built EPD System cables and bus ducts will be performed.	14. Analyses for the as-built EPD System exist and conclude that cable and bus duct capacities, as determined by cable and bus duct ratings, exceed their analyzed load requirements.
15. EPD System cables and bus ducts are rated to withstand fault currents for the time required to clear its fault from its power source.	15. Analyses for the as-built EPD System to determine fault currents will be performed.	15. Analyses for the as-built EPD System exist and conclude that cables and bus ducts will withstand the analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the analyzed faults from their power sources.
16. For the EPD System, Class 1E power is supplied by three independent Class 1E divisions. Independence is maintained between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	16. a. Tests on the as-built EPD System will be conducted by providing a test signal in only one Class 1E division at a time. b. Inspections of the as-built EPD System Class 1E divisions will be conducted.	16. a. A test signal exists in only the Class 1E division under test in the EPD System. b. In the EPD System, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.
17. Class 1E medium voltage M/C switchgear and low voltage P/C switchgear and MCCs are identified according to their Class 1E division.	17. Inspections of the as-built EPD System Class 1E M/C and P/C switchgear and MCCs will be conducted.	17. As-built Class 1E M/C and P/C switchgear, and MCCs are identified according to their Class 1E division.
18. Class 1E M/C and P/C switchgear and MCCs are located in Seismic Category I structures and in their respective divisional areas.	18. Inspections of the as-built Class 1E M/C and P/C switchgear and MCCs will be conducted.	18. As-built Class 1E M/C and P/C switchgear, and MCCs are located in Seismic Category I structures and in their respective divisional areas.

Table 2.12.1 Electric Power Distribution System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
19. Class 1E EPD System cables and raceways are identified according to their Class 1E division.	19. Inspections of the as-built Class 1E EPD System cables and raceways will be conducted.	19. As-built Class 1E EPD System cables and raceways are identified according to their Class 1E division.
20. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.	20. Inspection of the as-built Class 1E EPD System divisional cables and raceways will be conducted.	20. As-built Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.
21. Harmonic Distortion waveforms do not prevent Class 1E equipment from performing their safety functions.	21. Analyses for the as-built EPD System to determine harmonic distortions will be performed.	21. Analyses for the as-built EPD System exist and conclude that harmonic distortion waveforms do not exceed 5% voltage distortion on the Class 1E EPD System.
22. The EPD System supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.	22. a. Analyses for the as-built EPD System to determine voltage drops will be performed. b. Type tests at manufacturer's shop will be performed for the operating voltage range of the Class 1E electrical equipment. c. System preoperational and Startup tests will be conducted of the as-built Class 1E EPD System.	22. a. Analyses for the as-built EPD System exist and conclude that the analyzed operating voltage supplied at the terminals of the Class 1E utilization equipment is within the utilization equipment's voltage tolerance limits, as determined by their nameplate ratings. b. Manufacturer's type test reports exist and conclude that the operating range is within the tested voltage range for the Class 1E electrical equipment. c. The test voltages from preoperational test reports are compared against system voltage analysis of the as-built Class 1E EPD system. The results of comparison conclude that the available voltage is within the operating range for the as-installed equipment.

Table 2.12.1 Electric Power Distribution System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
23. An electrical grounding system is provided for (1) instrumentation, control, and computer systems, (2) electrical equipment (switchgear, distribution panels, transformers, and motors) and (3) mechanical equipment (fuel and chemical tanks). Lightning protection systems are provided for buildings and for structures and transformers located outside of the buildings. Each grounding system and lightning protection system is separately grounded to the plant grounding grid.	23. Inspections of the as-built EPD System plant Grounding and Lightning Protection Systems will be conducted.	23. The as-built EPD System instrumentation, control, and computer grounding system, electrical equipment and mechanical equipment grounding system, and lightning protection systems provided for buildings and for structures and transformers located outside of the buildings are separately grounded to the plant grounding grid.
24. MCR alarms, displays and controls provided for the EPD System are as defined in Section 2.12.1.	24. Inspections will be conducted on the MCR alarms, displays and controls for the EPD System.	24. Displays and controls exist or can be retrieved in the MCR as defined in Section 2.12.1.
25. RSS displays and controls provided for the EPD System are as defined in Section 2.12.1.	25. Inspections will be conducted on the as-built RSS displays and controls for the EPD System.	25. Displays and controls exist or can be retrieved on the RSS as defined in Section 2.12.1.

2.12.2 Unit Auxiliary Transformer

No entry. Covered in Section 2.12.1.

2.12.3 Isolated Phase Bus

No entry. Covered in Section 2.12.1.

2.12.4 Nonsegregated Phase Bus

No entry. Covered in Section 2.12.1.

2.12.5 Metal Clad Switchgear

No entry. Covered in Section 2.12.1.

2.12.6 Power Center

No entry. Covered in Section 2.12.1.

2.12.7 Motor Control Center

No entry. Covered in Section 2.12.1.

2.12.8 Raceway System

No entry. Covered in Section 2.12.1.

2.12.9 Grounding Wire

No entry. Covered in Section 2.12.1.

2.12.10 Electrical Wiring Penetration

Design Description

Electrical penetrations are provided for electrical cables passing through the primary containment.

Electrical penetrations are classified as safety-related.

Electrical penetrations are protected against currents that are greater than their continuous current rating.

Electrical penetrations are classified as Seismic Category I.

Divisional electrical penetrations only contain cables of one Class 1E division. Independence is provided between divisional electrical penetrations and also between divisional electrical penetrations and penetrations containing non-Class 1E cables.

Electrical penetrations are qualified for a harsh environment.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.10 provides a definition of the inspections, tests, and/or analyses, together with the associated acceptance criteria, which will be undertaken for the Electrical Wiring Penetrations.

Table 2.12.10 Electrical Wiring Penetration

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the Electrical Wiring Penetration is described in Section 2.12.10.	1. Inspections of the as-built Electrical Wiring Penetration will be conducted.	1. The as-built Electrical Wiring Penetration conforms with the basic configuration described in Section 2.12.10.
2. Electrical penetrations are protected against currents that are greater than their continuous current ratings.	2. Analyses for the as-built electrical penetrations and protective features will be performed.	2. Analyses for the as-built electrical penetrations and protective features exist and conclude either 1) that the maximum current of the circuits does not exceed the continuous current rating of the penetration, or 2) that the circuits have redundant protective devices in series and that the redundant protection devices are coordinated with the penetration's rated short circuit thermal capacity data and prevent current from exceeding the continuous current rating of the electrical penetrations.
3. Divisional electrical penetrations only contain cables of one Class 1E division.	3. Inspections of the as-built divisional electrical penetrations will be conducted.	3. As-built divisional electrical penetrations only contain cables of one Class 1E division.
4. Independence is provided between divisional electrical penetrations and between divisional electrical penetrations and penetrations containing non-Class 1E cables.	4. Inspections of the as-built electrical penetrations will be conducted.	4. Physical separation exists between as-built divisional electrical penetrations. Physical separation exists between these divisional electrical penetrations and penetrations containing non-Class 1E cables.

2.12.11 Combustion Turbine Generator

Design Description

The Combustion Turbine Generator (CTG) is a self-contained unit with its own supporting auxiliary systems. The CTG functions as an alternate AC power source.

The CTG is classified as non-safety-related.

The CTG can supply power to the non-Class 1E plant investment protection (PIP) busses or to the Class 1E divisional busses. The CTG capacity to supply power is at least as large as the capacity of an emergency diesel generator (DG). The CTG is located outside the Reactor Building.

The CTG has the following displays and controls in the main control room (MCR):

(1) Parameter displays for the CTG output voltage, amperes, kVA, and frequency.

(2) Controls for manually initiating the CTG.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.11 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the CTG.

Table 2.12.11 Combustion Turbine Generator

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the CTG is described in Section 2.12.11.	1. Inspections of the as-built CTG will be conducted.	1. The as-built CTG conforms with the basic configuration described in Section 2.12.11.
2. The CTG can supply power to the non-Class 1E busses or to the Class 1E divisional busses.	2. Tests on the as-built CTG will be conducted by connecting the CTG to the non-Class 1E PIP busses and to the Class 1E divisional busses.	2. The as-built CTG can supply power to the non-Class 1E PIP busses or to the Class 1E divisional busses.
3. The CTG capacity to supply power is at least as large as the capacity of a DG.	3. Inspections of the as-built CTG and DGs will be conducted.	3. The as-built CTG capacity to supply power is at least as large as the capacity of a DG, as determined by the CTG and DG nameplate ratings.
4. MCR displays and controls provided for the CTG are as defined in Section 2.12.11.	4. Inspections will be conducted on the MCR displays and controls for the CTG.	4. Displays and controls exist or can be retrieved in the MCR as defined in Section 2.12.11.

2.12.12 Direct Current Power Supply

Design Description

The Direct Current Power Supply consists of Class 1E and non-Class 1E batteries, battery chargers, and their respective direct current (DC) distribution panels, motor control centers (MCC), power, and instrumentation and control cables to the distribution system loads. The DC distribution system also includes the protection equipment provided to protect the DC distribution equipment. The Class 1E Direct Current Power Supply and its connections to the Electrical Power Distribution (EPD) System are shown on Figure 2.12.12.

The Class 1E DC electrical power distribution system consists of four Class 1E divisions (Divisions I, II, III, and IV) of batteries with their respective DC electrical distribution panels, DC MCCs, if provided for motor loads, and battery chargers. The Class 1E DC distribution system provides DC power to Class 1E DC equipment and instrumentation and control circuits.

The non-Class 1E DC electrical power distribution system consists of non-Class 1E batteries with their respective DC electrical distribution panels, DC MCC, if provided for motor loads, and battery chargers. The non-Class 1E DC distribution system provides DC power to non-Class 1E DC equipment and instrumentation and control circuits.

Except for Division IV, each Class 1E divisional (Divisions I,II, and III) battery is provided with a normal battery charger supplied alternating current (AC) power from a MCC in the same Class 1E division as the battery. The Division IV normal battery charger is supplied AC power from a Division II MCC. There are no automatic connections between Class 1E divisions. Interlocks are provided to prevent manual paralleling between Class 1E divisions.

Each Class 1E battery is sized to supply its design loads, at the end-of-installed-life, for a minimum of 2 hours without recharging.

Each Class 1E normal battery charger is sized to supply its respective Class 1E division's normal steady-state loads while charging its respective Class 1E battery.

The Class 1E battery, and battery charger circuit breakers, and DC distribution panels, MCCs, and their circuit breakers and fuses are sized to supply their load requirements. The Class 1E battery, battery charger, and DC distribution panels, and MCCs are rated to withstand fault currents for the time required to clear the fault from its power source. Circuit breakers and fuses in Class 1E battery, battery charger, DC distribution panel, and MCC circuits are rated to interrupt fault currents.

Class 1E DC electrical distribution system circuit interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest to the fault opens before other devices. For instances where coordination cannot be practically achieved, analysis will justify the lack of coordination.

Class 1E DC electrical distribution system cables are sized to supply their load requirements and are rated to withstand fault currents for the time required to clear the fault from its power source.

The Class 1E DC electrical distribution system supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.

Each Class 1E battery is located in a Seismic Category I structure and in its respective divisional battery room.

Class 1E DC distribution panels and MCCs are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas.

Class 1E DC distribution system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.

For the Class 1E DC electrical distribution system, independence is provided between Class 1E divisions, and also between Class 1E divisions and non-Class 1E equipment.

The only non-Class 1E load connected to the Class 1E DC electrical power distribution system is the associated DC emergency lighting system.

The Class 1E DC power supply has the following alarms and displays in the main control room (MCR):

(1) Alarms for battery ground detection.

(2) Parameter Displays for battery voltage and amperes.

(3) Status indication for battery circuit breaker/disconnect position.

Class 1E equipment is classified as Seismic Category I.

Class 1E equipment which is located in areas designated as harsh environment areas is qualified for harsh environments.

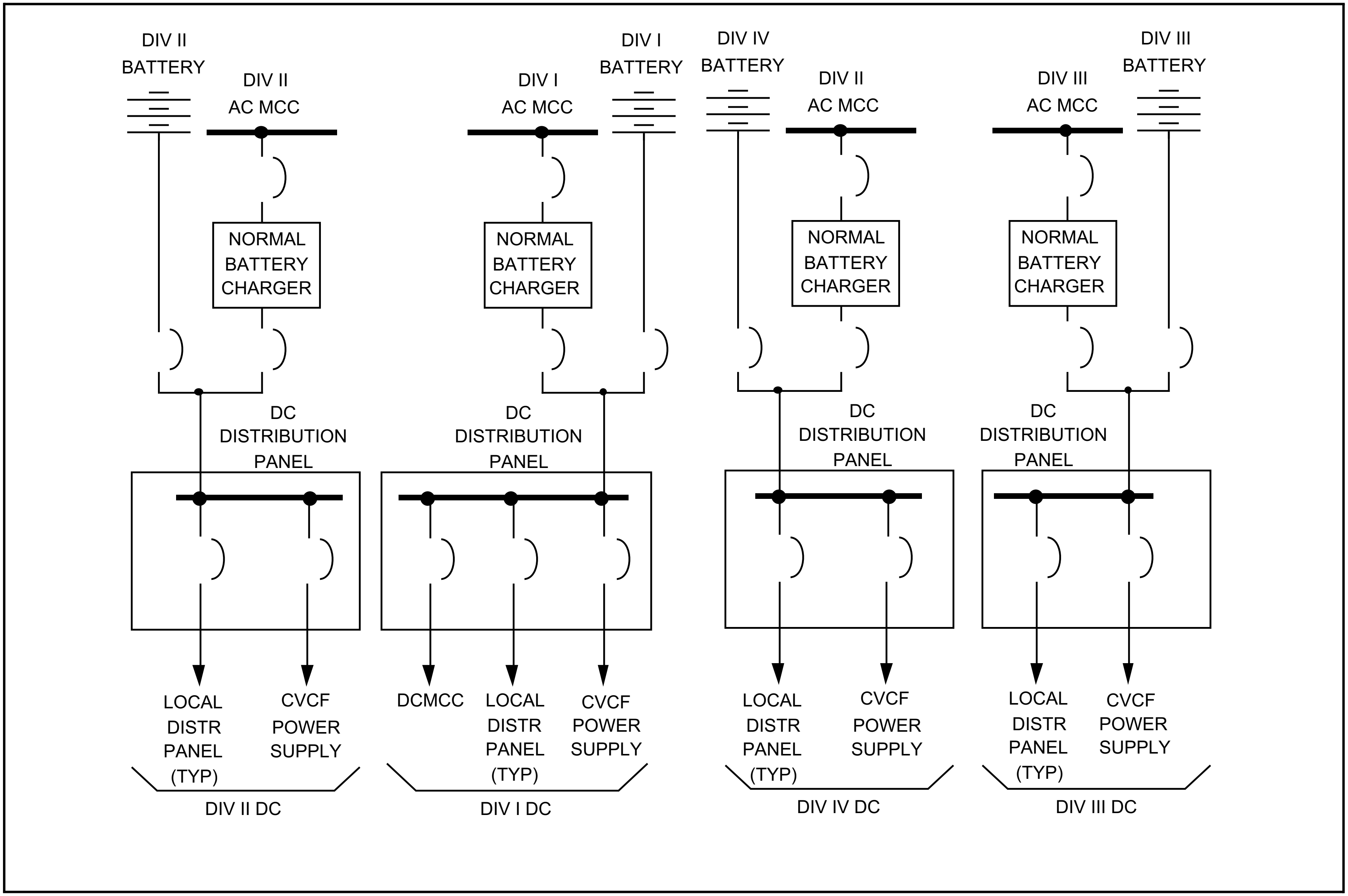


Figure 2.12.12 Direct Current Power Supply (Class 1E)

Table 2.12.12 Direct Current Power Supply

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the Direct Current Power Supply is described in Section 2.12.12.	1. Inspections of the as-built system will be conducted.	1. The as-built Direct Current Power Supply conforms with the basic configuration described in Section 2.12.12.
2. Except for Division IV, each Class 1E divisional (Divisions I,II, and III) battery is provided with a normal battery charger supplied AC power from a MCC in the same Class 1E division as the battery. The Division IV normal battery charger is supplied AC power from a Division II MCC.	2. Inspections of the as-built Class 1E Direct Current Power Supply will be conducted.	2. Each as-built Class 1E divisional (Divisions I,II, and III) battery is provided with a normal battery charger supplied AC power from a MCC in the same Class 1E division as the battery. The Division IV normal battery charger is supplied AC power from a Division II MCC.
3. Interlocks are provided to prevent manual paralleling between Class 1E divisions.	3. Tests of the as-built Class 1E interlocks will be conducted by attempting to close each interlocked pair of breakers.	3. The as-built Class 1E interlocks prevent paralleling between Class 1E divisions. The connections between Class 1E divisions are manual only.
4. Each Class 1E battery is sized to supply its design loads, at the end-of-installed-life, for a minimum of 2 hours without recharging.	4. a. Analyses for the as-built Class 1E batteries to determine battery capacities will be performed based on the design duty cycle for each battery. b. Tests of each as-built class 1E battery will be conducted by simulating loads which envelope the analyzed battery design duty cycle.	4. a. Analyses for the as-built Class 1E batteries exist and conclude that each Class 1E battery has the capacity, as determined by the as-built battery rating, to supply its analyzed design loads, at the end-of-installed-life, for a minimum of 2 hours without recharging. b. The capacity of each as-built Class 1E battery equals or exceeds the analyzed battery design duty cycle capacity.

Table 2.12.12 Direct Current Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5. Each Class 1E normal battery charger is sized to supply its respective Class 1E division's normal steady state loads while charging its respective Class 1E battery.	5. Tests of each as-built Class 1E normal battery charger will be conducted by supplying its respective Class 1E division's normal steady state loads while charging its respective Class 1E battery.	5. Each as-built Class 1E normal battery charger can supply its respective Class 1E division's normal steady state loads while charging its respective Class 1E battery.
6. The Class 1E DC battery and battery charger circuit breakers, and DC distribution panels, MCCs, and their circuit breakers and fuses, are sized to supply their load requirements.	6. Analyses for the as-built Class 1E DC electrical distribution system to determine the capacities of the battery and battery charger circuit breakers and DC distribution panels, MCCs, and their circuit breakers and fuses, will be performed.	6. Analyses for the as-built Class 1E DC electrical distribution system exist and conclude that the capacities of Class 1E battery and battery charger circuit breakers, and DC distribution panels, MCCs, and their circuit breakers and fuses, as determined by their nameplate ratings, exceed their analyzed load requirements.

Table 2.12.12 Direct Current Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7.	7.	7.
a. The Class 1E battery, battery chargers, and DC distribution panels, and MCCs are rated to withstand fault currents for the time required to clear the fault from its power source.	a. Analyses for the as-built Class 1E DC electrical distribution system to determine fault currents will be performed.	a. Analyses for the as-built Class 1E DC electrical distribution system exist and conclude that the capacities of as-built Class 1E battery, battery charger, DC distribution panel, and MCC current capacities exceed their analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the fault from its power source.
b. Circuit breakers and fuses in Class 1E battery, battery charger, DC distribution panel, and MCC circuits are rated to interrupt fault currents.	b. Analyses for the as-built Class 1E DC electrical distribution system to determine fault currents will be performed.	b. Analyses for the as-built Class 1E DC electrical distribution system exist and conclude that the analyzed fault currents do not exceed the interrupt capacity of circuit breakers and fuses in the battery, battery charger, DC distribution panel, and MCC circuit, as determined by their nameplate ratings.
8. Class 1E DC electrical distribution system circuit interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest to the fault opens before other devices.	8. Analyses for the as-built Class 1E DC electrical distribution system to determine circuit interrupting device coordination will be performed.	8. Analyses for the as-built Class 1E DC electrical distribution system circuit interrupting devices exist and conclude that, to the maximum extent possible, the analyzed circuit interrupter closest to the fault will open before other devices. For instances where coordination cannot be practically achieved, the analysis will justify the lack of coordination.

Table 2.12.12 Direct Current Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
9. Class 1E DC electrical distribution system cables are sized to supply their load requirements.	9. Analyses for the as-built Class 1E DC electrical distribution system cables to determine their load requirements will be performed.	9. Analyses for the as-built Class 1E DC electrical distribution system cables exist and conclude that the Class 1E DC electrical distribution system cable capacities, as determined by cable ratings, exceed their analyzed load requirements.
10. Class 1E DC electrical distribution system cables are rated to withstand fault currents for the time required to clear the fault from its power source.	10. Analyses for the as-built Class 1E DC electrical distribution system to determine fault currents will be performed.	10. Analyses for the as-built Class 1E DC electrical distribution system exist and conclude that the Class 1E DC electrical distribution system cables will withstand the analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the fault from its power source.

Table 2.12.12 Direct Current Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
11. The Class 1E DC electrical distribution system supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.	11. a. Analyses for the as-built Class 1E DC electrical distribution system to determine system voltage drops will be performed.	11. a. Analyses for the as-built Class 1E DC electrical distribution system exist and conclude that the analyzed operating voltage supplied at the terminals of the Class 1E utilization equipment is within the utilization equipment's voltage tolerance limits, as determined by their nameplate ratings.
	b. Type tests at manufacturer's shop will be performed for the operating voltage range of the Class 1E DC electrical equipment.	b. Manufacturer's type test reports exist and conclude that the operating range is within the tested voltage range for the Class 1E DC electrical equipment.
	c. System preoperational tests will be conducted on the as-built Class 1E DC System.	c. The test voltages from preoperational test reports are compared against system voltage analysis of the as-built 1E EPD system. The results of comparison conclude that the available voltage is within the operating range for the as-installed DC equipment.
12. Each Class 1E battery is located in a Seismic Category I structure and in its respective divisional battery room.	12. Inspections of the as-built Class 1E batteries will be conducted.	12. Each as-built Class 1E battery is located in a Seismic Category I structure and in its respective divisional battery room.
13. Class 1E DC distribution panels, and MCCs are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas.	13. Inspections of the as-built Class 1E DC distribution panels and MCCs will be conducted.	13. As-built DC distribution panels and MCCs are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas.

Table 2.12.12 Direct Current Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
14. Class 1E DC distribution system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.	14. Inspections of the as-built Class 1E DC distribution system cables and raceways will be conducted.	14. As-built Class 1E DC distribution system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.
15. For the Class 1E DC electrical distribution system, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	15. a. Tests will be conducted on the as-built DC electrical distribution system by providing a test signal in only one Class 1E division at a time. b. Inspections of the as-built DC electrical distribution system will be conducted.	15. a. A test signal exists in only the Class 1E division under test in the DC electrical distribution system. b. In the as-built DC electrical distribution system, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.
16. MCR alarms and displays provided for the Direct Current Power Supply are as defined in Section 2.12.12.	16. Inspections will be conducted on the alarms and displays for the Direct Current Power Supply.	16. Alarms and displays exist or can be retrieved in the MCR as defined in Section 2.12.12.

2.12.13 Emergency Diesel Generator System

Design Description

The Emergency Diesel Generator (DG) System consists of three diesel engines and their respective combustion air intake system, starting air system, fuel oil system (from the day tank to the engine), lubricating oil system, engine jacket cooling water system, engine exhaust system and silencer, governor system, and generator with its excitation and voltage regulation systems.

The three DGs are classified as Class 1E, safety-related and supply standby AC power to their respective Class 1E Electrical Power Distribution (EPD) System divisions (Divisions I, II, and III). The DG connections to the EPD System are shown on Figure 2.12.1.

The DGs are sized to supply their load demand following a loss-of-coolant accident (LOCA). The DG air start receiver tanks are sized to provide five DG starts without recharging their tanks.

A loss of preferred power (LOPP) signal (bus under-voltage) from an EPD System medium voltage divisional bus automatically starts its respective DG, and initiates automatic load shedding and connection of the DG to its divisional bus. A DG automatically connects to its respective bus when DG required voltage and frequency conditions are established and required motor loads are tripped. After a DG connects to its respective bus, the non-accident loads are automatically sequenced onto the bus.

LOCA signals from the Residual Heat Removal (RHR) (Division I) and High Pressure Core Flooder (HPCF) (Divisions II and III) systems automatically start their respective divisional DG. After starting, the DGs remain in a standby mode (i.e. running at required voltage and frequency, but not connected to their busses), unless a LOPP signal exists. When LOCA and LOPP signals exist, load shedding occurs and required motor loads are tripped, the DG automatically connects to its respective divisional bus. After a DG connects to its respective bus, the LOCA loads are automatically sequenced onto the bus.

A manual start signal from the main control room (MCR) or from the local control station in the DG area starts a DG. After starting, the DG remains in a standby mode, unless a LOPP signal exists.

DGs start, attain required voltage and frequency, and are ready to load in ≤ 20 seconds after receiving an automatic or manual start signal.

When a DG is operating in parallel (test mode) with offsite power, a loss of the offsite power source used for testing or a LOCA signal overrides the test mode by disconnecting the DG from its respective divisional bus.

The DG units are classified Seismic Category I and DG auxiliary systems are classified Seismic Category I, ASME Code Class 3, and Class 1E, and are located in their respective divisional areas in the Reactor Building. The DG combustion air intakes are located above the maximum flood level. The DG combustion air intakes are separated from DG exhaust ducts. Class 1E DG unit auxiliary systems are supplied electrical power from the same Class 1E division as the DG unit. Independence is provided between Class 1E divisions and also between Class 1E divisions and non-Class 1E equipment. Each divisional DG (Divisions I, II, and III) with its auxiliary systems is physically separated from the other divisions.

The DG System has the following displays and controls in the MCR.

(1) Parameter displays for the DG output voltage, amperes, watts, vars, frequency, and engine speed.

(2) Controls for manually starting and stopping the DG units.

The DG System has displays at the Remote Shutdown System (RSS) for DG run and stop indication.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.13 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the Emergency Diesel Generator System.

Table 2.12.13 Emergency Diesel Generator System

Inspections, Tests, Analyses and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the DG System is described in Section 2.12.13.	1. Inspection of the as-built system will be conducted.	1. The as-built DG System conforms with the basic configuration described in Section 2.12.13.
2. The DGs are sized to supply their load demand following a LOCA.	2. Analyses to determine DG load demand, based on the as-built DG load profile, will be performed.	2. Analyses for the as-built DG systems exist and conclude that the DG System capacities exceed, as determined by their nameplate ratings, their load demand following a LOCA.
3. DG air start receiver tanks have capacity for five DG starts without recharging their tanks.	3. Tests on the as-built DG Systems will be conducted by starting the DGs five times.	3. As-built DGs start five times without recharging their air start receiver tanks.
4. A LOPP signal (bus under-voltage) from an EPD System medium voltage divisional bus automatically starts its respective DG, and initiates automatic load shedding and connection of the DG to its divisional bus. A DG automatically connects to its respective bus when DG required voltage and frequency conditions are established and required motor loads are tripped. After a DG connects to its respective bus, the non-accident loads are automatically sequenced onto the bus.	4. Tests on the as-built DG Systems will be conducted by providing a simulated LOPP signal.	4. As-built DGs automatically start on receiving a LOPP signal and attain a voltage and frequency in ≤ 20 seconds which assures an operating voltage and frequency at the terminals of the Class1E utilization equipment that is within the tolerance limits of the utilization equipment, automatically connect to their respective divisional bus, after required motor loads are tripped, and sequence their non-accident loads onto the bus.

Table 2.12.13 Emergency Diesel Generator System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5. LOCA signals from the RHR (Division I) and HPCF (Divisions II and III) System automatically start their respective divisional DG. After starting, the DGs remain in a standby mode (i.e. running at required voltage and frequency, but not connected to their busses), unless a LOPP signal exists.	5. Tests on the as-built DG Systems will be conducted by providing a simulated LOCA signal, without a LOPP signal.	5. As-built DGs automatically start on receiving a LOCA signal and attain a voltage and frequency in ≤ 20 seconds which assures an operating voltage and frequency at the terminals of the Class 1E utilization equipment that is within the tolerance limits of the utilization equipment, and remain in the standby mode.
6. When LOCA and LOPP signals exist, load shedding occurs, and required motor loads are tripped, the DG automatically connects to its respective divisional bus. After a DG connects to its respective bus, the LOCA loads are automatically sequenced onto the bus.	6. Tests on the as-built DG Systems will be conducted by providing simulated LOCA and LOPP signals.	6. In the as-built DG Systems, when LOCA and LOPP signals exist, the DG automatically connects to its respective divisional bus. The automatic load sequence begins at ≤ 20 seconds. Following application of each load, the bus voltage does not drop more than 25% measured at the bus. Frequency is restored to within 2% of nominal, and voltage is restored to within 10% of nominal within 60% of each load sequence time interval. The HPCF and RHR pump motor loads are sequenced on to the bus in ≤ 36 seconds for design basis events.

Table 2.12.13 Emergency Diesel Generator System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7. A manual start signal from the MCR or from the local control station in the DG area starts a DG. After starting, the DG remains in a standby mode (i.e. running at required voltage and frequency, but not connected to its bus), unless a LOPP signal exists.	7. Tests on the as-built DG Systems will be conducted by providing a manual start signal from the MCR and from the local control station, without a LOPP signal.	7. As-built DGs automatically start on receiving a manual start signal from the MCR or from the local control station and attain a voltage and frequency in ≤ 20 seconds which assures an operating voltage and frequency at the terminals of the Class 1E utilization equipment that is within the tolerance limits of the utilization equipment and remain in the standby mode.
8. When a DG is operating in parallel (test mode) with offsite power, a loss of the offsite power source used for testing or a LOCA signal overrides the test mode by disconnecting the DG from its respective divisional bus.	8. Tests on the as-built DG Systems will be conducted by providing simulated loss of offsite power and LOCA signals while operating the DGs in the test mode.	8. When the as-built DG Systems are operating in the test mode with offsite power and a loss of offsite power or a LOCA signal is received, DGs automatically disconnect from their respective divisional buses.
9. In the DG system, Class 1E DG unit auxiliary systems are supplied electrical power from the same Class 1E division as the DG unit. Independence is provided between Class 1E divisions and between Class 1E divisions and non-Class 1E equipment.	9. a. Tests will be conducted in the as-built DG Systems by providing a test signal in only one Class 1E division at a time. b. Inspections of the as-built Class 1E divisions in the DG systems will be conducted.	9. a. The test signal exists in only the Class 1E division under test in the DG System. b. In the DG systems, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.
10. Each divisional DG (Divisions I, II, and III) with its auxiliary systems is physically separated from the other divisions.	10. Inspections of the as-built DG Systems will be conducted.	10. Each DG with its auxiliary systems is physically separated from the other divisions by structural and/or fire barriers.

Table 2.12.13 Emergency Diesel Generator System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
11. MCR displays and controls provided for the DG System are as defined in Section 2.12.13	11. Inspections will be conducted on the MCR displays and controls for the as-built DG Systems.	11. Displays and controls exist or can be retrieved in the MCR as defined in Section 2.12.13.
12. RSS displays provided for the DG System are as defined in Section 2.12.13	12. Inspections will be conducted on the RSS displays for the as-built DG Systems.	12. Displays exist or can be retrieved on the RSS as defined in Section 2.12.13.

2.12.14 Vital AC Power Supply

Design Description

The Vital AC Power Supply consists of Class 1E and non-Class 1E uninterruptible power supplies, and their respective alternating current (AC) distribution panels, power, and instrumentation and control cables to the distribution system loads. The AC distribution system also includes the protection equipment provided to protect the AC distribution equipment. The Class 1E Vital AC Power Supply connections to the Electrical Power Distribution (EPD) System and the Direct Current Power Supply are shown on Figure 2.12.14.

The Class 1E Vital AC Power Supply consists of four divisions (Division I, II, III, and IV) of uninterruptible power supplies with their respective distribution panels. Each Class 1E power supply provides uninterruptible, regulated AC power to Class 1E circuits which require continuity of power during a loss of preferred power (LOPP). Each Class 1E Vital AC Power Supply is a constant voltage constant frequency (CVCF) inverter power supply unit.

The non-Class 1E Vital AC Power Supply consists of uninterruptible power supplies with their respective distribution panels. Each non-Class 1E power supply provides uninterruptible, regulated AC power to non-Class 1E circuits which require continuity of power during a LOPP. Each non-Class 1E Vital AC Power Supply is a CVCF inverter power supply unit.

Each Class 1E CVCF unit has three input power sources. Except for the Division IV CVCF unit, the normal power to each Class 1E CVCF unit is supplied from an AC motor control center (MCC) in the same Class 1E division as the CVCF unit. The Division IV Class 1E CVCF unit is supplied AC power from a Division II AC MCC. The backup power for each Class 1E CVCF unit is supplied from the direct current (DC) battery in the same Class 1E division as the CVCF unit. In addition, each Class 1E CVCF unit contains an alternate power supply. The alternate power supply is supplied power from the same AC power source as the normal power supply.

Each Class 1E CVCF normal and backup power supply is synchronized, in both frequency and phase, with its alternate power supply and maintains continuity of power during transfer from the inverter to the alternate supply. Automatic transfer between each Class 1E CVCF unit's three power sources is provided. Manual transfer between each Class 1E CVCF unit power source is also provided.

Each Class 1E CVCF unit is sized to provide output power to its respective distribution panel loads. There are no automatic connections between Class 1E divisions.

Class 1E CVCF units and their respective distribution panels are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas. Independence is provided between Class 1E divisions, and also between Class 1E divisions and non-Class 1E equipment.

Class 1E Vital AC Power Supply system distribution panels and their circuit breakers and fuses are sized to supply their load requirements. Distribution panels are rated to withstand fault currents for the time required to clear the fault from its power source. Circuit breakers and fuses are rated to interrupt fault currents.

Class 1E Vital AC Power Supply system interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest to the fault opens before other devices. For instances where coordination cannot be practically achieved, analysis will justify the lack of coordination.

Class 1E Vital AC Power Supply system cables are sized to supply their load requirements and are rated to withstand fault currents for the time required to clear the fault from its power source.

The Class 1E Vital AC Power Supply system supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.

Class 1E Vital AC Power Supply system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.

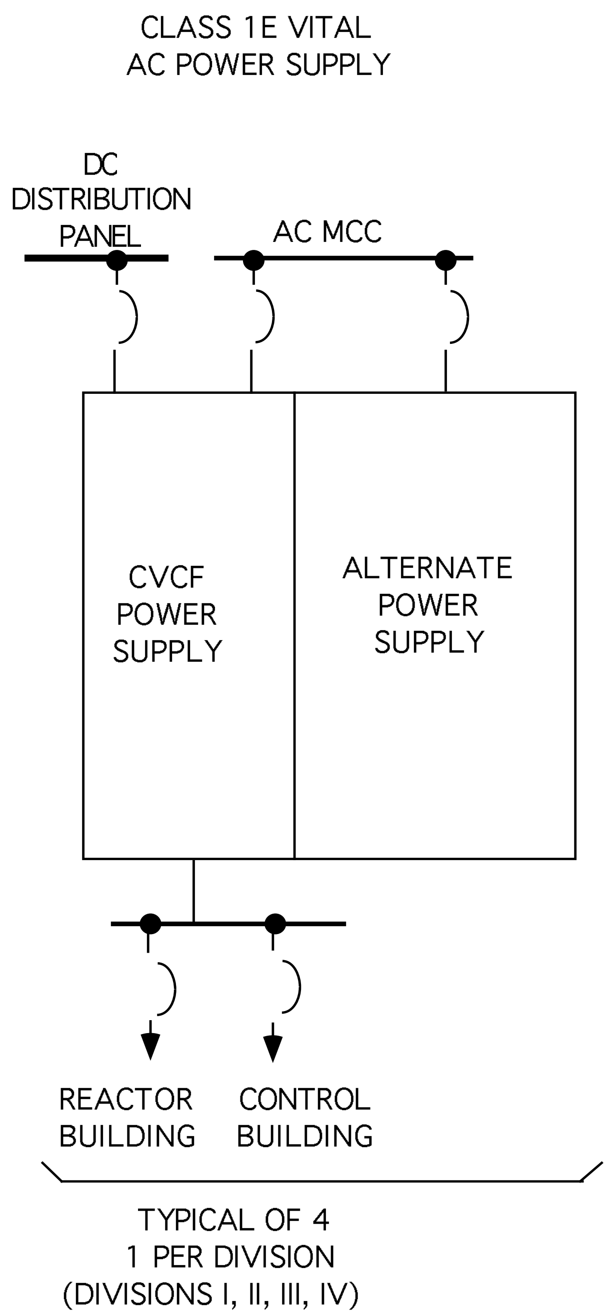
The Class 1E Vital AC Power Supply has alarms for high and low CVCF unit output voltage and frequency in the main control room (MCR).

Class 1E equipment is classified as Seismic Category I.

Class 1E equipment which is located in areas designated as harsh environment areas is qualified for harsh environments.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.14 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the Vital AC Power Supply.



NOTES:
1. THE DIVISION IV CLASS 1E CVCF UNIT IS SUPPLIED BY AC POWER FROM A DIVISION I AC MCC.

Figure 2.12.14 Vital AC Power Supply

Table 2.12.14 Vital AC Power Supply

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the Vital AC Power Supply is described in Section 2.12.14.	1. Inspections of the as-built system will be conducted.	1. The as-built Vital AC Power Supply conforms with the basic configuration described in Section 2.12.14.
2. Each Class 1E CVCF unit has three input power sources. Except for the Division IV CVCF unit, the normal power to each Class 1E CVCF unit is supplied from an AC MCC in the same Class 1E division as the CVCF unit. The Division IV Class 1E CVCF unit is supplied AC power from a Division II AC MCC. The backup power for each Class 1E CVCF unit is supplied from the DC battery in the same Class 1E division as the CVCF unit. In addition, each Class 1E CVCF unit contains an alternate power supply. The alternate power supply is supplied power from the same AC power source as the normal power supply.	2. Inspections of the as-built Class 1E Vital AC Power Supply system will be conducted.	2. Each as-built CVCF unit has three input power sources. Except for the Division IV CVCF unit, the normal power to each CVCF unit is supplied from an AC MCC in the same Class 1E division as the CVCF unit. The Division IV CVCF unit is supplied AC power from a Division II AC MCC. The backup power for each CVCF unit is supplied from the DC battery in the same Class 1E division as the CVCF unit. In addition, each Class 1E CVCF unit contains an alternate power supply. The alternate power supply is supplied power from the same AC power source as the normal power supply.
3. Automatic transfer between each Class 1E CVCF unit's three power sources is provided and maintains continuity of power during transfer from the inverter to the alternate supply. Manual transfer between each Class 1E CVCF unit power source is also provided.	3. Tests on each as-built Class 1E CVCF unit will be conducted by providing a test signal in one power source at a time. A test of the manual transfer will also be conducted.	3. Each as-built Class 1E CVCF unit automatically and manually transfers between the unit's three power sources and maintains continuity of power during transfer from the inverter to the alternate supply.
4. Each Class 1E CVCF unit is sized to provide output power to its respective distribution panel loads.	4. Analyses for each as-built Class 1E CVCF unit to determine the power requirements of its loads will be performed.	4. Analyses for each as-built Class 1E CVCF unit exist and conclude that each CVCF unit’s capacity, as determined by its nameplate rating, exceeds its analyzed load requirements.

Table 2.12.14 Vital AC Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5. Class 1E CVCF units and their respective distribution panels are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas.	5. Inspections of the as-built Class 1E CVCF units and their respective distribution panels will be conducted.	5. The as-built Class 1E CVCF units and their respective distribution panels are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas.
6. In the Vital AC Power Supply, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	6. a. Tests on the Vital AC Power Supply will be conducted by providing a test signal in only one Class 1E division at a time. b. Inspections of the as-built Class 1E divisions in the Vital AC Power Supply will be conducted.	6. a. A test signal exists only in the Class 1E division under test in the Vital AC Power Supply. b. In the Vital AC Power Supply, physical separation or electrical isolation exists between the Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.
7. Class 1E Vital AC Power Supply system distribution panels and their respective circuit breakers and fuses are sized to supply their load requirements.	7. Analyses for the as-built distribution panels and their respective circuit breakers and fuses to determine their load requirements will be performed.	7. Analyses for the as-built Class 1E Vital AC Power Supply system distribution panels and their respective circuit breakers and fuses exist and conclude that the capacities of the distribution panels, circuit breakers, and fuses exceed, as determined by their nameplate ratings, their analyzed load requirements.

Table 2.12.14 Vital AC Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
8. Class 1E Vital AC Power Supply system distribution panels are rated to withstand fault currents for the time required to clear the fault from its power source.	8. Analyses for the as-built Class 1E distribution system to determine fault currents will be performed.	8. Analyses for the as-built Class 1E Vital AC Power Supply system distribution panels exist and conclude that the current capacities of the distribution panels, exceed their analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the fault from its power source.
9. Class 1E Vital AC Power Supply system distribution panel circuit breakers and fuses are rated to interrupt fault currents.	9. Analyses for the as-built Class 1E distribution system to determine fault currents will be performed.	9. Analyses for the as-built Class 1E Vital AC Power Supply distribution system exist and conclude that the analyzed fault currents do not exceed the distribution system circuit breakers and fuses interrupt capabilities, as determined by their nameplate ratings.
10. Class 1E Vital AC Power Supply system interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest to the fault opens before other devices.	10. Analyses for the as-built Class 1E distribution system to determine circuit interrupting device coordination will be performed.	10. Analyses for the as-built Class 1E Vital AC Power Supply system circuit interrupting devices (circuit breakers and fuses) coordination exist and conclude that, to the maximum extent possible, the analyzed circuit interrupter closest to the fault will open before other devices. For instances where coordination cannot be practically achieved, the analysis will justify the lack of coordination.
11. Class 1E Vital AC Power Supply system cables are sized to supply their load requirements.	11. Analyses for the as-built Class 1E distribution system cables to determine their load requirements will be performed.	11. Analyses for the as-built Class 1E Vital AC Power Supply system cables exist and conclude that the capacities of the distribution system cables exceed, as determined by their cable ratings, their analyzed load requirements.

Table 2.12.14 Vital AC Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
12. Class 1E Vital AC Power Supply system cables are rated to withstand fault currents for the time required to clear the fault from its power source.	12. Analyses for the as-built Class 1E distribution system to determine fault currents will be performed.	12. Analyses for the as-built Class 1E Vital AC Power Supply system cables exist and conclude that the distribution system cable current capacities exceed their analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the fault from its power source.
13. The Class 1E Vital AC Power Supply system supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.	13. Analyses for the as-built Class 1E Vital AC Power Supply system to determine voltage drops will be performed.	13. Analyses for the as-built Class 1E Vital AC Power Supply system exist and conclude that the analyzed operating voltage supplied at the terminals of the Class 1E utilization equipment is within the utilization equipment's voltage tolerance limits, as determined by their nameplate ratings.
14. Class 1E Vital AC Power Supply system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.	14. Inspections of the as-built Class 1E Vital AC Power Supply system cables and raceways will be conducted.	14. As-built Class 1E Vital AC Power Supply system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.
15. MCR alarms provided for the Class 1E Vital AC Power Supply are as defined in Section 2.12.14.	15. Inspections will be conducted on the MCR alarms for the as-built Class 1E Vital AC Power Supply.	15. Alarms exist or can be retrieved in the MCR as defined in Section 2.12.14.

2.12.15 Instrument and Control Power Supply

Design Description

The Instrument and Control Power Supply consists of Class 1E and non-Class 1E interruptible power supplies and their respective alternating current (AC) distribution panels, power, and instrumentation and control cables to the distribution system loads. The AC distribution system also includes the protection equipment provided to protect the AC distribution equipment. The Class 1E Instrument and Control Power Supply connections to the Electrical Power Distribution (EPD) System are shown on Figure 2.12.15.

The Class 1E Instrument and Control Power Supply consists of four divisions (Division I, II, III, and IV) of interruptible power supplies with their respective distribution panels. Each Class 1E power supply provides interruptible, regulated AC power to Class 1E circuits which do not require continuity of power during a loss of preferred power (LOPP).

The non-Class 1E Instrument and Control Power Supply consists of an interruptible power supply with its respective distribution panel. The non-Class 1E power supply provides interruptible, regulated AC power to non-Class 1E circuits which do not require continuity of power during a LOPP.

Each Class 1E Instrument and Control Power Supply is a voltage regulating device. The power to each Class 1E Instrument and Control Power Supply voltage regulating device is supplied from an AC MCC in the same Class 1E division as the device.

Each Class 1E Instrument and Control Power Supply is sized to provide output power to its respective distribution panel loads.There are no automatic connections between Class 1E divisions.

Class 1E Instrument and Control Power Supplies and their respective distribution panels are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas. Independence is provided between Class 1E divisions, and also between Class 1E divisions and non-Class 1E equipment.

Class 1E Instrument and Control Power Supply system distribution panels and their circuit breakers and fuses are sized to supply their load requirements. Distribution panels are rated to withstand fault currents for the time required to clear the fault from its power source. Circuit breakers and fuses are rated to interrupt fault currents.

Class 1E Instrument and Control Power Supply system interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest to the fault opens before other devices. For instances where coordination cannot be practically achieved, analysis will justify the lack of coordination.

Class 1E Instrument and Control Power Supply system cables are sized to supply their load requirements and are rated to withstand fault currents for the time required to clear the fault from its power source.

The Class 1E Instrument and Control Power Supply system supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.

Class 1E Instrument and Control Power Supply system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.

Class 1E equipment is classified as Seismic Category I.

Class 1E equipment which is located in areas designated as harsh environment areas is qualified for harsh environments.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.15 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the Instrument and Control Power Supply.

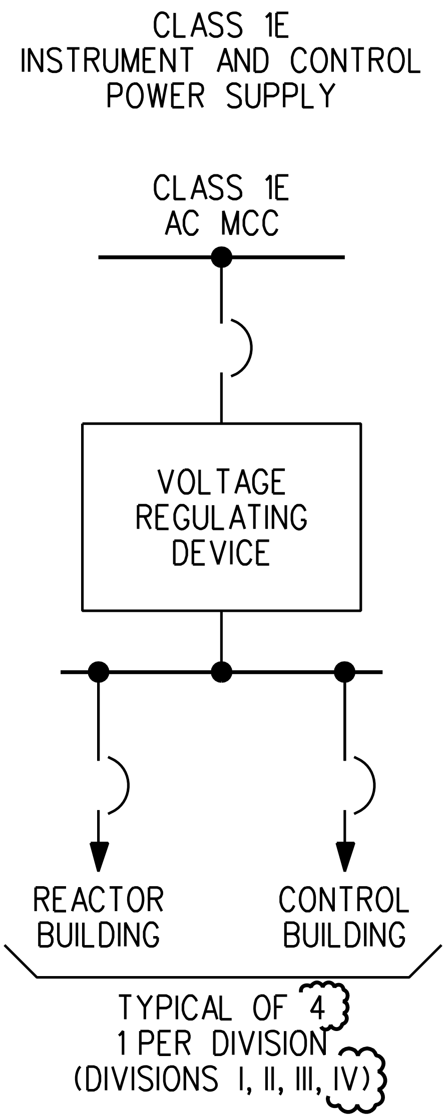


Figure 2.12.15 Instrument and Control Power Supply

Table 2.12.15 Instrument and Control Power Supply

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the Instrument and Control Power Supply is described in Section 2.12.15.	1. Inspections of the as-built system will be conducted.	1. The as-built Instrument and Control Power Supply conforms with the basic configuration described in Section 2.12.15.
2. The power to each Class 1E Instrument and Control Power Supply voltage regulating device is supplied from an AC MCC in the same Class 1E division as the device.	2. Inspections of the as-built Class 1E Instrument and Control Power Supply will be conducted.	2. The power to each as-built Class 1E Instrument and Control Power Supply voltage regulating device is supplied from an AC MCC in the same Class 1E division as the device.
3. Each Class 1E AC Instrument and Control Power Supply is sized to provide output power to its respective distribution panel loads.	3. Analyses for each as-built Class 1E Instrument and Control Power Supply to determine the power requirements of its loads will be performed.	3. Analyses for each as-built Class 1E Instrument and Control Power Supply exist and conclude that each Instrument and Control Power Supply capacity, as determined by its nameplate rating, exceeds its analyzed load requirements.
4. Class 1E Instrument and Control Power Supplies and their respective distribution panels are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas.	4. Inspections of the as-built Class 1E Instrument and Control Power Supplies and their respective distribution panels will be conducted.	4. The as-built Class 1E Instrument and Control Power Supplies and their respective distribution panels are identified according to their Class 1E division and are located in Seismic Category I structures and in their respective divisional areas.
5. In the Instrumentation and Control Power Supply, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	5. a. Tests on the Instrumentation and Control Power Supply will be conducted by providing a test signal in only one Class 1E division at a time. b. Inspections of the as-built Class 1E divisions in the Instrumentation and Control Power Supply will be conducted.	5. a. A test signal exists only in the Class 1E division under test in the Instrumentation and Control Power Supply. b. In the Instrumentation and Control Power Supply, physical separation or electrical isolation exists between the Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.

Table 2.12.15 Instrument and Control Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
6. Class 1E Instrument and Control Power Supply system distribution panels and their respective circuit breakers and fuses are sized to supply their load requirements.	6. Analyses for the as-built distribution panels and their respective circuit breakers and fuses to determine their load requirements will be performed.	6. Analyses for the as-built Class 1E Instrument and Control Power Supply system distribution panels and their respective circuit breakers and fuses exist and conclude that the capacities of the distribution panels, circuit breakers, and fuses exceed, as determined by their nameplate ratings, their analyzed load requirements.
7. Class 1E Instrument and Control Power Supply system distribution panels are rated to withstand fault currents for the time required to clear the fault from its power source.	7. Analyses for the as-built Class 1E distribution system to determine fault currents will be performed.	7. Analyses for the as-built Class 1E Instrument and Control Power Supply system distribution panels exist and conclude that the current capacities of the distribution panels exceed their analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the fault from its power source.
8. Class 1E Instrument and Control Power Supply system distribution panel circuit breakers and fuses are rated to interrupt fault currents.	8. Analyses for the as-built Class 1E distribution system to determine fault currents will be performed.	8. Analyses for the as-built Class 1E Instrument and Control Power Supply distribution system exist and conclude that the analyzed fault currents do not exceed the distribution system circuit breakers and fuses interrupt capabilities, as determined by their nameplate ratings.

Table 2.12.15 Instrument and Control Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
9. Class 1E Instrument and Control Power Supply system interrupting devices (circuit breakers and fuses) are coordinated to the maximum extent possible, so that the circuit interrupter closest the fault opens before other devices.	9. Analyses for the as-built Class 1E distribution system to determine circuit interrupting device coordination will be performed.	9. Analyses for the as-built Class 1E Instrument and Control Power Supply system circuit interrupting devices (circuit breakers and fuses) coordination exist and conclude that, to the maximum extent possible, the analyzed circuit interrupter closest to the fault will open before other devices. For instances where coordination cannot be practically achieved, the analysis will justify the lack of coordination.
10. Class 1E Instrument and Control Power Supply system cables are sized to supply their load requirements.	10. Analyses for the as-built Class 1E distribution system cables to determine their load requirements will be performed.	10. Analyses for the as-built Class 1E Instrument and Control Power Supply system cables exist and conclude that the capacities of the distribution system cables exceed, as determined by their cable ratings, their analyzed load requirements.
11. Class 1E Instrument and Control Power Supply system cables are rated to withstand fault currents for the time required to clear the fault from its power source.	11. Analyses for the as-built Class 1E distribution system to determine fault currents will be performed.	11. Analyses for the as-built Class 1E Instrument and Control Power Supply system cables exist and conclude that the distribution system cable current capacities exceed their analyzed fault currents for the time required, as determined by the circuit interrupting device coordination analyses, to clear the fault from its power source.
12. The Class 1E Instrument and Control Power Supply system supplies an operating voltage at the terminals of the Class 1E utilization equipment that is within the utilization equipment's voltage tolerance limits.	12. Analyses for the as-built Class 1E Instrument and Control Power Supply system to determine voltage drops will be performed.	12. Analyses for the as-built Class 1E Instrument and Control Power Supply system exist and conclude that the analyzed operating voltage supplied at the terminals of the Class 1E utilization equipment is within the utilization equipment's voltage tolerance limits, as determined by their nameplate ratings.

Table 2.12.15 Instrument and Control Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
13. Class 1E Instrument and Control Power Supply system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.	13. Inspections of the as-built Class 1E Instrument and Control Power Supply system cables and raceways will be conducted.	13. As-built Class 1E Instrument and Control Power Supply system cables and raceways are identified according to their Class 1E division. Class 1E divisional cables are routed in Seismic Category I structures and in their respective divisional raceways.

2.12.16 Communication System

Design Description

The parts of the plant Communication System within the Certified Design consist of a power-actuated paging and broadcasting system and a separate sound-powered telephone system. The parts of the Communication System associated with off-site communications are not within the Certified Design.

The power-actuated paging system provides intraplant station to station communications and area broadcasting in buildings and outside areas. The system consists of at least two channels, with one channel allowing access from the plant telephone system. Each channel is provided with an amplifier and a distribution frame. Handsets and speakers are provided. The power-actuated paging system is powered from plant power supply and is backed by its own battery.

The sound-powered communication system consists of a main communication patch panel, a set of communication stations and a system of cables and jacks. This system provides communication capability between the main control room (MCR), Remote Shutdown System (RSS) panel, electrical equipment area and diesel generator areas. The patch panel is located outside the MCR. The sound-powered communication system does not require any electrical power source for its operation.

The plant Communication System is classified as non-safety related.

Interface Requirements

The parts of the Communication System which are not within the Certified Design shall meet the following requirements:

An emergency communication system for off-site communication shall be provided.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.16 provides a definition of the inspections, tests, and/or analyses, together with the associated acceptance criteria, which will be undertaken for the Communication System.

Table 2.12.16 Communication System

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the plant Communication System is described in Section 2.12.16.	1. Inspections of the as-built plant Communication System will be conducted.	1. The as-built plant Communication System conforms with the basic configuration described in Section 2.12.16.
2. The power actuated paging system provides intraplant, station to station communications and area broadcasting in buildings and outside areas.	2. Tests of the as-built power actuated paging system will be conducted.	2. The power actuated paging system provides intraplant, station to station communications and area broadcasting in buildings and outside areas.
3. The sound-powered communications system provides communication capability between the main control room, remote shutdown panel, electrical equipment area and the diesel generator areas.	3. Tests of the as-built sound-powered communications system will be conducted.	3. The sound-powered communications system provides communication capability between the main control room, remote shutdown panel, electrical equipment area and the diesel generator areas.

2.12.17 Lighting and Servicing Power Supply

Design Description

The Lighting and Servicing Power Supply (LSPS) consists of multiple lighting systems and a non-Class 1E service power supply system. The non-Class 1E service power supply system supplies power to non-Class 1E loads which are not required for plant power operation.

There are four lighting systems: the normal alternating current (AC) lighting system, the standby AC lighting system, the emergency direct current (DC) lighting system, and the guide lamp lighting system.

The normal AC lighting system provides lighting needed for operation, inspection, and repairs during normal plant operation in areas containing non-safety related equipment. The normal lighting system is part of the plant's non-safety-related systems and is supplied by the non-Class 1E power system buses.

The AC standby lighting system is comprised of the non-Class 1E AC standby lighting system and the associated AC standby lighting system. The non-Class 1E AC standby lighting system serves both safety-related and non-safety-related areas and their passageways and stairwells and is powered by the plant investment protection (PIP) busses. The associated AC standby lighting system serves the safety-related divisional areas and the passageways and stairwells leading to the divisional areas.

Each division of associated AC standby lighting is supplied power from its respective Class 1E division (Division I, II, and III). The associated AC standby lighting in the main control room (MCR) is supplied from divisions II and III. The associated AC standby lighting in the division IV battery room and other division IV instrumentation and control areas is supplied from division II.

The DC emergency lighting system is comprised of the non-Class 1E DC emergency lighting system and the associated DC emergency lighting system. The DC emergency lighting system provides DC backup lighting, when AC lighting is lost, until the normal or standby lighting systems are energized. The non-Class 1E DC emergency lighting system supplies the lighting needed in plant areas containing non-safety-related equipment and is supplied by the non-Class 1E DC system. The associated DC emergency lighting system supplies the lighting needed in plant areas containing safety-related equipment.

Each division of associated DC emergency lighting is supplied by power from its respective Class 1E division (Divisions I, II, III, and IV).The associated DC emergency lighting in the MCR is supplied from divisions II and III.

The guide lamp light system serves stairways, exit routes, and major control areas (MCR and Remote Shutdown System (RSS) areas). Each Class 1E guide lamp unit is a self-contained battery pack unit containing a rechargeable battery with a minimum 8-hour capacity. The Class

1E guide lamp units are supplied AC power from the same power source that supplies the associated AC standby lighting system in the area in which they are located. The non-Class 1E guide lamp units in non-safety-related plant areas are supplied power by the non-Class 1E system.

Lighting circuits, excluding lighting fixtures, that are connected to a Class 1E power source are identified as associated circuits and are treated as Class 1E circuits. In the LSPS, independence is provided between Class 1E divisions, and also between Class 1E divisions and non-Class 1E equipment.

Class 1E or associated lighting distribution system equipment is identified according to its Class 1E division and is located in Seismic Category I structures, and in its respective divisional areas.

Class 1E or associated lighting system cables and raceways are identified according to their Class 1E division. Class 1E or associated lighting system cables are routed in their respective divisional raceways and in Seismic Category I structures. Associated DC emergency lighting system cables are not routed with any other cables and are specifically identified as DC lighting.

Class 1E equipment is classified as Seismic Category I.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.17 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the Lighting and Servicing Power Supply.

Table 2.12.17 Lighting and Servicing Power Supply

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration of the LSPS is described in Section 2.12.17.	1. Inspections of the as-built system will be conducted.	1. The as-built LSPS conforms with the basic configuration described in Section 2.12.17.
2. Each division of associated AC standby lighting is supplied power from its respective Class 1E division.	2. Tests on the associated AC standby lighting will be conducted by providing a test signal in only one Class 1E division at a time.	2. The as-built associated AC standby lighting is supplied power only from its respective Class 1E division.
3. The associated AC standby lighting in the MCR is supplied from Divisions II and III.	3. Tests on the associated AC standby lighting will be conducted by providing a test signal in only one Class 1E division at a time.	3. The as-built associated AC standby lighting in the MCR is supplied from Divisions II and III.
4. The associated AC standby lighting in the Division IV battery room and other Division IV instrumentation and control areas is supplied from Division II.	4. Tests on the associated AC standby lighting will be conducted by providing a test signal in only one Class 1E division at a time.	4. The as-built associated AC standby lighting in the Division IV battery room and other Division IV instrumentation and control areas is supplied from Division II.
5. Each division of associated DC emergency lighting is supplied power from its respective Class 1E division.	5. Tests on the associated DC emergency lighting will be conducted by providing a test signal in only one Class 1E division at a time.	5. The as-built associated DC emergency lighting is supplied power from its respective Class 1E division.
6. The associated DC emergency lighting in the MCR is supplied from Divisions II and III.	6. Tests on the associated DC emergency lighting will be conducted by providing a test signal in only one Class 1E division at a time.	6. The as-built associated DC emergency lighting in the MCR is supplied from Divisions II and III.

Table 2.12.17 Lighting and Servicing Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7. Each Class 1E guide lamp unit is a self-contained, battery pack unit containing a rechargeable battery with a minimum 8-hour capacity. The Class 1E guide lamp units are supplied AC power from the same power source that supplies the associated AC standby lighting system in the area in which they are located.	7. a. Inspections of the as-built Class 1E guide lamp units will be conducted. b. Tests on the as-built Class 1E guide lamp units will be conducted by providing a test signal in only one Class 1E division at a time.	7. a. The Class 1E guide lamp units are self-contained, battery pack units containing a rechargeable battery with a minimum 8-hour capacity. b. The Class 1E guide lamp units are supplied AC power from the same power source that supplies the associated AC standby lighting system in the area in which it is located. The Class 1E guide lamp units are turned on when the associated AC standby lighting system in the area in which they are located is lost.
8. Lighting circuits, excluding lighting fixtures, that are connected to a Class 1E power source are identified as associated circuits and treated as Class 1E circuits.	8. Inspections of the associated lighting circuits will be conducted.	8. The as-built associated lighting circuits are identified as associated circuits and treated as Class 1E circuits.
9. In the LSPS, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	9. a. Tests on the LSPS will be conducted by providing a test signal in only one Class 1E division at a time. b. Inspections of the as-built Class 1E divisions in the LSPS will be conducted.	9. a. A test signal exists in only the Class 1E division under test in the LSPS. b. In the LSPS, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.

Table 2.12.17 Lighting and Servicing Power Supply (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
10. Class 1E or associated lighting distribution system equipment is identified according to its Class 1E division and is located in Seismic Category I structures, and in its respective divisional areas (except for features in design commitment No. 3, 4 and 6).	10. Inspections of the as-built Class 1E and associated lighting systems will be conducted.	10. The as-built Class 1E and associated lighting distribution system equipment is identified according to its Class 1E division and is located in Seismic Category I structures, and in its respective divisional areas (except for features in design commitment No. 3, 4 and 6).
11. Class 1E or associated lighting system cables and raceways, are identified according to their Class 1E division.	11. Inspections of the as-built Class 1E and associated lighting system cables and raceways will be conducted.	11. The as-built Class 1E and associated lighting system cables and raceways are identified according to their Class 1E division.
12. Class 1E or associated lighting system cables are routed in their respective divisional raceways and in Seismic Category I structures.	12. Inspections of the as-built Class 1E and associated lighting system cables and raceways will be conducted.	12. The as-built Class 1E and associated lighting system cables are routed in their respective divisional raceways and in Seismic Category I structures.
13. Associated DC emergency lighting system cables are not routed with any other cables and are specifically identified as DC lighting.	13. Inspections of the as-built associated DC emergency lighting system cables will be conducted.	13. Associated DC emergency lighting system cables are not routed with any other cables and are specifically identified as DC lighting.