2.5.5 Preferred (Offsite) Power Supply System

Design Description

1.0 System Description

The preferred (offsite) power system provides the preferred power to the Class 1E emergency power supply system (EPSS) via the emergency auxiliary transformers (EAT) and offsite power to the normal power supply system (NPSS) via the normal auxiliary transformers (NAT) during normal and abnormal operation.

2.0 Arrangement

2.1 Deleted.

3.0 Mechanical Design Features

3.1 Each EAT and NAT has an oil containment system.

3.2 Each EAT and NAT has a deluge fire protection system.

4.0 Electrical Power Design Features

4.1 Each of the two required GDC 17 independent off-site power sources are monitored by a phase monitoring system that detects:

1. An open phase with no EAT high-side ground.
2. An open phase with an EAT high side ground between the open phase and the EAT.
3. Two EAT high side open phases (simultaneously).

In the event condition 1, 2, or 3 is detected, the phase monitoring system provides a control room alarm and automatically separates the EAT from the off-site power source and transfers EAT loads to the unaffected EAT or the emergency diesel generators.

4.2 EAT power cables and instrumentation and control circuits are routed separately from NAT power cables and instrumentation and control circuits.

4.3 Each EAT and associated power cables are sized to power the EPSS safety-related and non-safety-related loads.

4.4 Each NAT and associated electrical bus is sized to power the connected NPSS non-safety-related loads.

5.0 Interface Requirements

5.1 At least two independent circuits shall be supplied to the station switchyard by the offsite power transmission system.

5.2 Each offsite power circuit shall be sized to supply the station safety-related and non-safety-related loads during normal and off normal operation.

5.3 Each EAT shall be connected to the switchyard via an independent circuit, sized to supply the four EPSS divisions.

5.4 The maximum transmission system frequency decay rate is bounded by the RCP free coastdown for a complete loss of forced reactor coolant flow analysis due to a loss of offsite power event.

5.5 The EATs and NATs switchyard circuit breakers shall be sized to supply their load requirements.

5.6 The offsite transmission power, instrumentation, and control circuits shall be independent.

5.7 The switchyard instrumentation for any main control room (MCR) displays and alarms (e.g., circuit breaker position indication, control voltage) shall be compatible with the certified design I&C systems.

5.8 Lighting protection and grounding is provided for the switchyard.

5.9 There is separation between EATs, and between each EAT and the NATs or the main step-up transformers (MSU).

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.5.5-1 lists the preferred (offsite) power supply system ITAAC.

Table 2.5.5-1—Preferred (Offsite) Power Supply System ITAAC
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Commitment Wording		Inspections, Tests, Analyses[1]	Acceptance Criteria
2.1	Deleted.	Deleted.	Deleted.
3.1	Each EAT and NAT has an oil containment system.	An inspection will be performed to verify that each as-built EAT (30BDT01 and 30BDT02) and NAT (30BBT01 and 30BBT02) has an oil containment system.	Each EAT and NAT has an oil containment system.
3.2	Each EAT and NAT has a deluge fire protection system.	An inspection will be performed to verify that each as-built EAT (30BDT01 and 30BDT02) and NAT (30BBT01 and 30BBT02) has a deluge fire protection system.	Each EAT and NAT has a deluge fire protection system.
4.1	Each of the two required GDC 17 independent off-site power sources are monitored by a phase monitoring system that detects: 1. An open phase with no EAT high-side ground. 2. An open phase with an EAT high side ground between the open phase and the EAT. 3. Two EAT high side open phases (simultaneously). In the event condition 1, 2, or 3 is detected, the phase monitoring system provides a control room alarm and automatically separates the EAT from the off-site power source and transfers EAT loads to the unaffected EAT or the emergency diesel generators.	a. An analysis will be performed to determine the setpoints that the phase monitoring system will use to detect: – An open phase with no EAT high-side ground. – An open phase with an EAT high side ground between the open phase and the EAT. – Two EAT high side open phases (simultaneously).	a. A report exists that demonstrates that the phase monitoring system will detect: – An open phase with no EAT high-side ground. – An open phase with an EAT high side ground between the open phase and the EAT. – Two EAT high side open phases (simultaneously).

Table 2.5.5-1—Preferred (Offsite) Power Supply System ITAAC
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Commitment Wording		Inspections, Tests, Analyses[1]	Acceptance Criteria
		b. A test will be performed to verify that the as-built phase monitoring system provides a control room alarm and automatically separates the EAT from the off-site power source and transfers EAT loads to the unaffected EAT or the emergency diesel generators.	b. A report exists that demonstrates that the phase monitoring system for the two required GDC-17 independent off-site power sources provides a control room alarm and automatically separates the EAT from the off-site power source and transfers EAT loads to the unaffected EAT or the emergency diesel generators.
4.2	EAT power cables and instrumentation and control circuits are routed separately from NAT power cables and instrumentation and control circuits.	An inspection will be performed to verify that as-built EAT power cables and instrumentation and control circuits are routed separately from NAT power cables and instrumentation and control circuits.	The EAT power cables and instrumentation and control circuits are routed separately from NAT power cables and instrumentation and control circuits.
4.3	Each EAT and associated power cables are sized to power the EPSS safety-related and non-safety-related loads.	An inspection and analysis will be performed to verify as-built EAT cables and buses are sized to supply their assigned load requirements.	An equipment sizing analysis concludes EAT cables and buses are sized to supply analyzed load requirements.
4.4	Each NAT and associated electrical bus is sized to power the connected NPSS non-safety-related loads.	An inspection and analysis will be performed to verify as-built NAT cables and buses are sized to supply their assigned load requirements.	An equipment sizing analysis concludes NAT cables and buses are sized to supply analyzed load requirements.

1. Equipment tag numbers are provided for information only and are not part of the certified design.

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