2.5.3 Station Blackout Alternate AC Source

Design Description

1.0 System Description

Two station blackout diesel generators (SBODG) are provided as the alternate ac (AAC) source to provide power to station loads necessary to bring and maintain the plant in a safe shutdown condition during beyond design basis event station blackout conditions.

2.0 Mechanical Design Features

2.1 The mechanical portions of the SBODG air start system are independent of the mechanical portions of the emergency diesel generator (EDG) air start system.

2.2 Each SBODG has a fuel oil storage tank.

2.3 Each SBODG has a fuel oil day tank.

2.4 Each fuel oil transfer pump capacity is greater than SBODG fuel oil consumption at the continuous rating.

3.0 I&C Design Features, Displays, and Controls

3.1 Displays listed in Table 2.5.3-1—Station Blackout Alternate AC Source Electrical Equipment Design, are indicated on the PICS operator workstations in the main control room (MCR) and the remote shutdown station (RSS).

3.2 Controls on the PICS on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.5.3-1.

4.0 Electrical Power Design Features

4.1 The SBODGs are connected to the emergency power supply system (EPSS) Class 1E buses through two in-series circuit breakers (one Class 1E circuit breaker at the Class 1E EPSS bus and one non-Class 1E circuit breaker at the non-Class 1E normal power supply system (NPSS) bus).

4.2 SBODG #1 is capable of connecting to EPSS Divisions 1 and 2.

4.3 SBODG #2 is capable of connecting to EPSS Divisions 3 and 4.

4.4 Each SBODG output rating is greater than the analyzed loads assigned in the respective EPSS divisions.

4.5 The electrical portions of the SBODG air start system are independent of the electrical portions of the EDG air start system.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.5.3-2 lists the station blackout AAC source ITAAC.

Table 2.5.3-1—Station Blackout Alternate AC Source Electrical Equipment Design

Description	Tag Number(1)	IEEE Class 1E	MCR/RSS Displays	MCR/RSS Controls
SBODG #1	30XKA50	No	Generator voltage, current, frequency, power, reactive power. Engine running, not running / Generator voltage, current, frequency, power, reactive power. Engine running, not running	Generator output voltage raise and lower, output breaker close and trip. Engine start, stop, governor raise and lower / Generator output voltage raise and lower, output breaker close and trip. Engine start, stop, governor raise and lower
SBODG #2	30XKA80	No	Generator voltage, current, frequency, power, reactive power. Engine running, not running / Generator voltage, current, frequency, power, reactive power. Engine running, not running	Generator output voltage raise and lower, output breaker close and trip. Engine start, stop, governor raise and lower / Generator output voltage raise and lower, output breaker close and trip. Engine start, stop, governor raise and lower

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

Table 2.5.3-2—Station Blackout Alternate AC Source ITAAC
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Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The mechanical portions of the SBODG air start system are independent of the mechanical portions of the EDG air start system.	An inspection will be performed of the as-built mechanical portions of the SBODG air start system to verify independence of the mechanical portions of the EDG air start system.	The mechanical portion of the SBODG air start system is located in the switchgear building and each EDG air start system is located in each EPGB.
2.2	Each SBODG has a fuel oil storage tank.	An inspection and analysis will be performed to verify each as-built SBODG fuel oil storage tank capacity is greater than the volume of fuel oil consumed by the SBODG operating at the continuous rating for 24 hours.	Each SBODG fuel oil storage tank capacity is greater than the volume of fuel oil consumed by the SBODG operating at the continuous rating for 24 hours.
2.3	Each SBODG has a fuel oil day tank.	An inspection and analysis will be performed to verify each as-built SBODG day tank capacity is greater than the volume of fuel oil consumed by the SBODG operating at the continuous rating for two hours.	Each SBODG day tank capacity is greater than the volume of fuel oil consumed by the SBODG operating at the continuous rating for two hours.
2.4	Each fuel oil transfer pump capacity is greater than SBODG fuel oil consumption at the continuous rating.	A test will be performed to verify each fuel oil transfer pump capacity is greater than SBODG fuel oil consumption at the continuous rating.	The flow rate of each fuel oil transfer pump is greater than SBODG fuel oil consumption at the continuous rating.

Table 2.5.3-2—Station Blackout Alternate AC Source ITAAC
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Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.1	Displays listed in Table 2.5.3-1 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Table 2.5.3-1 are indicated on the PICS operator workstations in the MCR by using test input signals to PICS. b. Tests will be performed to verify that the displays listed in Table 2.5.3-1 are indicated on the PICS operator workstations in the RSS by using test input signals inputs to PICS.	a. Displays listed in Table 2.5.3-1 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Table 2.5.3-1 are indicated on the PICS operator workstations in the RSS.
3.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.5.3-1.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.5.3-1. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.5.3-1.
4.1	The SBODGs are connected to the EPSS Class 1E buses through two in-series circuit breakers (one Class 1E circuit breaker at the Class 1E EPSS bus and one non-Class 1E circuit breaker at the non-Class 1E NPSS bus).	An inspection will be performed to verify the as-built SBODGs are connected to the EPSS Class 1E buses through two in-series circuit breakers.	The SBODGs are connected to the EPSS Class 1E buses through two in-series circuit breakers (one Class 1E circuit breaker at the Class 1E EPSS bus and one non-Class 1E circuit breaker at the non-Class 1E NPSS bus).
4.2	SBODG #1 is capable of connecting to EPSS Divisions 1 and 2.	A test will be performed using test input signals to verify SBODG #1 is capable of connecting to EPSS Divisions 1 and 2.	SBODG #1 starts and connects to EPSS Divisions 1 and 2 within 10 minutes of receiving a test input signal.

Table 2.5.3-2—Station Blackout Alternate AC Source ITAAC
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Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.3	SBODG #2 is capable of connecting to EPSS Divisions 3 and 4.	A test will be performed using test input signals to verify SBODG #2 is capable of connecting to EPSS Divisions 3 and 4.	SBODG #2 starts and connects to EPSS Divisions 3 and 4 buses within 10 minutes of receiving a test input signal.
4.4	Each SBODG output rating is greater than the analyzed loads assigned in the respective EPSS divisions.	An inspection and analysis will be performed to verify each as-built SBODG output rating is greater than the analyzed loads assigned in the respective EPSS divisions.	An analysis concludes each SBODG output rating is greater than the analyzed loads assigned in the respective EPSS divisions.
4.5	The electrical portions of the SBODG air start system are independent of the electrical portions of the EDG air start system.	An inspection will be performed to verify the as-built electrical portions of the SBODG air start system are independent of the electrical portions of the EDG air start system.	a. The SBODG air start system is powered from the normal power supply system and is independent of the EDG air start system which is powered from the emergency power supply system. b. The SBODG pilot air start solenoids are powered from the 12 hour uninterruptible power supply system buses and are independent of the EDG air start system pilot air start solenoids which are powered from the Class 1E uninterruptible power supply system.