3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One source from the offsite transmission network to the onsite AC electrical power distribution system(s) required by LCO 3.8.9, "Distribution Systems – Shutdown". The offsite power source shall be an offsite circuit
7 available or connected to one of the following:

1. 230 kV switchyard to a unit startup transformer to one main feeder bus,

2. 230 kV switchyard, or 525 kV switchyard for Unit 3, to the main step-up and unit auxiliary transformers to one main feeder bus, or

3. Central switchyard to one main feeder bus.

b. One emergency power source capable of supplying the onsite AC electrical power distribution system(s) required by LCO 3.8.9. The emergency power source shall include one of the following:

1. One Keowee Hydro Unit (KHU) capable of providing power through the underground emergency power path to one main feeder bus,

2. One KHU capable of providing power through the overhead emergency power path to one main feeder bus, or

3. One LCT energizing one standby bus via an isolated power path to one main feeder bus.

----------NOTE----------

1. A unit startup transformer may be shared with a Unit in MODES 1 through 6.

2. The requirements of ITS 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a LCT is used for the emergency power requirements.

3. The required emergency power source and required offsite power source shall not be susceptible to a failure disabling both sources.

BASES

APPLICABLE SAFETY ANALYSIS (continued)

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite emergency power sources and their associated emergency power paths.

The AC sources satisfy Criterion 3 of the 10 CFR 50.36 (Ref. 1).

LCO

One offsite source capable of supplying the onsite power distribution system(s) of LCO 3.8.9, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE emergency power source, associated with a distribution system required to be OPERABLE by LCO 3.8.9, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite source. Together, OPERABILITY of the required offsite source and emergency power source ensure the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite source must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the main feeder bus(es). Qualified offsite source are those that are described in the UFSAR and are part of the licensing basis for the unit.

7 An offsite source can be an offsite circuit available or connected through to the 230 kV switchyard to the startup transformer and to one main feeder bus. Additionally, the
7 offsite source can be an offsite circuit available or connected though the 230 kV switchyard (525 kV switchyard for Unit 3) to a backcharged unit main step-up transformer and unit auxiliary transformer to one main feeder bus. Another alternative is the energized Central 100 kV

(continued)

BASES

7 LCO (continued) switchyard available or connected through the 100 kV line and transformer CT-5 to one main feeder bus.

In MODES 5 or 6 and during movement of irradiated fuel, a Lee Combustion Turbine (LCT) energizing one standby bus via an isolated power path to one main feeder bus can be utilized as an emergency power source. The LCT is required to provide power within limits of voltage and frequency using the 100 kV transmission line electrically separated from the system grid and offsite loads energizing one or more standby buses through transformer CT-5. The required number of energized standby buses is based upon the requirements of LCO 3.8.9, "Distribution System - Shutdown."

An OPERABLE KHU must be capable of starting, accelerating to rated speed and voltage, and connecting to the main feeder bus(es). The sequence must be capable of being accomplished within 23 seconds after a manual emergency start initiation signal. An emergency power source must be capable of accepting required loads and must continue to operate until offsite power can be restored to the main feeder buses.

This LCO is modified by three Notes. Note 1 indicates that a unit startup transformer may be shared with a unit in MODES 5 and 6. Note 2 indicates that the requirements of Specification 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a Lee Combustion Turbine (LCT) is used for the emergency power requirements. Note 3 indicates that the required emergency power source and the required offsite power source shall not be susceptible to a failure disabling both sources.

The required emergency power source and required offsite source cannot be susceptible to a failure disabling both sources. If the required offsite source is the 230 kV switchyard and the startup transformer energizing the required main feeder bus(es), the KHU and its required underground emergency power path are required to be OPERABLE since it is not subject to a failure, such as an inoperable startup transformer, which simultaneously disables the offsite source. If the Central switchyard is serving as the required offsite source through the CT-5 transformer and required standby bus(es) energizing required main feeder bus(es), the KHU and its required overhead emergency power path are required to be OPERABLE to preclude failure of a standby bus from disabling the offsite source and the

(continued)

BASES

LCO (continued)

7 underground emergency power path. Conversely, if an LCT is being used as an emergency power source, the required offsite source must be an offsite circuit available or connected through the startup transformer or a backcharged unit main step-up transformer and the unit auxiliary transformer.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

A.1

An offsite source would be considered inoperable if it were not available to one required main feeder bus. Although two main feeder buses may be required by LCO 3.8.9, the one main feeder bus with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By the allowance of the option to declare features inoperable with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

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INSERT 3.8-19A

7 The offsite power source shall be an offsite circuit available or connected to one of the following:

1. 230 kV switchyard to a unit startup transformer to one main feeder bus,

2. 230 kV switchyard, or 525 kV switchyard for Unit 3, to the main step-up and unit auxiliary transformers to one main feeder bus, or

3. Central switchyard to one main feeder bus.

INSERT 3.8-19B

1. One Keowee Hydro Unit (KHU) capable of providing power through the underground emergency power path to one main feeder bus,

2. One KHU capable of providing power through the overhead emergency power path to one main feeder bus, or

3. One LCT energizing one standby bus via an isolated power path to one main feeder bus.

----------NOTE----------

1. A unit startup transformer may be shared with a Unit in MODES 1 through 6.

2. The requirements of ITS 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a LCT is used for the emergency power requirements.

3. The required emergency power source and required offsite power source shall not be susceptible to a failure disabling both sources.

INSERT B3.8-37A

7 An offsite source can be an offsite circuit available or connected through to the 230 kV switchyard to the startup transformer and to one main feeder bus. Additionally, the offsite source can be an offsite
7 circuit available or connected though the 230 kV switchyard (525 kV switchyard for Unit 3) to a backcharged unit main step-up transformer and unit auxiliary transformer to one main feeder bus. Another
7 alternative is the energized Central 100 kV switchyard available or connected through the 100 kV line and transformer CT-5 to one main feeder bus.

In MODES 5 or 6 and during movement of irradiated fuel, an Lee Combustion Turbine (LCT) energizing one standby bus via an isolated power path to one main feeder bus can be utilized as an emergency power source. The LCT is required to provide power within limits of voltage and frequency using the 100 kV transmission line electrically separated from the system grid and offsite loads energizing one or more standby buses through transformer CT-5. The required number of energized standby buses is based upon the requirements of LCO 3.8.9, "Distribution System - Shutdown."

INSERT B 3.8-37B

This LCO is modified by three Notes. Note 1 indicates that a unit startup transformer may be shared with a unit in MODES 5 and 6. Note 2 indicates that the requirements of Specification 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a Lee Combustion Turbine (LCT) is used for the emergency power requirements. Note 3 indicates that the required emergency power source and the required offsite power source shall not be susceptible to a failure disabling both sources.

The required emergency power source and required offsite source cannot be susceptible to a failure disabling both sources. If the required offsite source is the 230 kV switchyard and the startup transformer energizing the required main feeder bus(es), the KHU and its required underground emergency power path or the LCT via an isolated power path are required to be OPERABLE since they are not subject to a failure, such as an inoperable startup transformer, which simultaneously disables the offsite source. If the Central switchyard is serving as the required offsite source through the CT-5 transformer and required standby bus(es) energizing required main feeder bus(es), the KHU and its required overhead emergency power path are required to be OPERABLE to preclude failure of a standby bus from disabling the offsite source and the underground emergency power path. Conversely, if an LCT is being used as an emergency power source, the required offsite source must be
7 an offsite circuit available or connected through the startup transformer or a backcharged unit main step-up transformer and the unit auxiliary transformer.

ENCLOSURE 2

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One source from the offsite transmission network to the onsite AC electrical power distribution system(s) required by LCO 3.8.9, "Distribution Systems – Shutdown". The offsite power source shall be an offsite circuit available or connected to one of the following:

   1. 230 kV switchyard to a unit startup transformer to one main feeder bus,

   2. 230 kV switchyard, or 525 kV switchyard for Unit 3, to the main step-up and unit auxiliary transformers to one main feeder bus, or

   3. Central switchyard to one main feeder bus.

b. One emergency power source capable of supplying the onsite AC electrical power distribution system(s) required by LCO 3.8.9. The emergency power source shall include one of the following:

   1. One Keowee Hydro Unit (KHU) capable of providing power through the underground emergency power path to one main feeder bus,

   2. One KHU capable of providing power through the overhead emergency power path to one main feeder bus, or

   3. One LCT energizing one standby bus via an isolated power path to one main feeder bus.

----------NOTE----------

1. A unit startup transformer may be shared with a Unit in MODES 1 through 6.

2. The requirements of ITS 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a LCT is used for the emergency power requirements.

3. The required emergency power source and required offsite power source shall not be susceptible to a failure disabling both sources.

BASES

APPLICABLE SAFETY ANALYSIS (continued)

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite emergency power sources and their associated emergency power paths.

The AC sources satisfy Criterion 3 of the 10 CFR 50.36 (Ref. 1).

LCO

One offsite source capable of supplying the onsite power distribution system(s) of LCO 3.8.9, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE emergency power source, associated with a distribution system required to be OPERABLE by LCO 3.8.9, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite source. Together, OPERABILITY of the required offsite source and emergency power source ensure the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite source must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the main feeder bus(es). Qualified offsite source are those that are described in the UFSAR and are part of the licensing basis for the unit.

An offsite source can be an offsite circuit available or connected through to the 230 kV switchyard to the startup transformer and to one main feeder bus. Additionally, the offsite source can be an offsite circuit available or connected though the 230 kV switchyard (525 kV switchyard for Unit 3) to a backcharged unit main step-up transformer and unit auxiliary transformer to one main feeder bus. Another alternative is the energized Central 100 kV

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BASES

LCO (continued) switchyard available or connected through the 100 kV line and transformer CT-5 to one main feeder bus.

In MODES 5 or 6 and during movement of irradiated fuel, a Lee Combustion Turbine (LCT) energizing one standby bus via an isolated power path to one main feeder bus can be utilized as an emergency power source. The LCT is required to provide power within limits of voltage and frequency using the 100 kV transmission line electrically separated from the system grid and offsite loads energizing one or more standby buses through transformer CT-5. The required number of energized standby buses is based upon the requirements of LCO 3.8.9, "Distribution System - Shutdown."

An OPERABLE KHU must be capable of starting, accelerating to rated speed and voltage, and connecting to the main feeder bus(es). The sequence must be capable of being accomplished within 23 seconds after a manual emergency start initiation signal. An emergency power source must be capable of accepting required loads and must continue to operate until offsite power can be restored to the main feeder buses.

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The required emergency power source and required offsite source cannot be susceptible to a failure disabling both sources. If the required offsite source is the 230 kV switchyard and the startup transformer energizing the required main feeder bus(es), the KHU and its required underground emergency power path are required to be OPERABLE since it is not subject to a failure, such as an inoperable startup transformer, which simultaneously disables the offsite source. If the Central switchyard is serving as the required offsite source through the CT-5 transformer and required standby bus(es) energizing required main feeder bus(es), the KHU and its required overhead emergency power path are required to be OPERABLE to preclude failure of a standby bus from disabling the offsite source and the

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BASES

LCO (continued)

underground emergency power path. Conversely, if an LCT is being used as an emergency power source, the required offsite source must be an offsite circuit available or connected through the startup transformer or a backcharged unit main step-up transformer and the unit auxiliary transformer.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

A.1

An offsite source would be considered inoperable if it were not available to one required main feeder bus. Although two main feeder buses may be required by LCO 3.8.9, the one main feeder bus with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By the allowance of the option to declare features inoperable with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

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