

2.5.9 Lighting System

1.0 Description

The lighting system (LGT) includes the emergency lighting and special emergency lighting sub-systems. The non-safety-related functions provided by these two sub-systems include providing main control room (MCR) and remote shutdown station (RSS) lighting for normal and off normal operation.

2.0 Mechanical Design Features, Electrical and Seismic Classifications

2.1 Lighting fixtures in the MCR and RSS are Seismic Category II and can withstand seismic design basis loads without affecting plant safety functions.

3.0 Electrical Considerations

3.1 Emergency lighting in the MCR and RSS is powered from the emergency power supply system (EPSS).

3.2 Special emergency lighting in the MCR and RSS is powered from the Class 1E uninterruptible power supply system (EUPS).

3.3 The emergency lighting and special emergency lighting sub-systems provide illumination at the MCR and RSS workstations and safety-related panels.

3.4 The special emergency lighting system provides at least ten foot-candles illumination at the MCR and RSS workstations.

3.5 Eight-hour battery pack emergency lighting fixtures provide illumination for post-fire shutdown activities performed by operators outside the MCR or RSS where emergency diesel generator backed lighting is not credited.

4.0 Inspection, Tests, Analyses and Acceptance Criteria

Table 2.5.9-1 lists the LGT ITAAC.

Table 2.5.9-1—Lighting System ITAAC (2 Sheets)

| Commitment Wording | | Inspections, Tests, Analyses | Acceptance Criteria |
|---------------------------|---|--|---|
| 2.1 | Lighting fixtures in the MCR and RSS can withstand seismic design basis loads without affecting plant safety functions. | <ul style="list-style-type: none"> a. Type testing, analysis, or a combination of type testing and analysis will be performed using analytical assumptions, or under conditions, which bound the Seismic Category II design requirements. b. Inspections will be performed to verify that the lighting fixtures including anchorage are installed as specified on the construction drawings. | <ul style="list-style-type: none"> a. Tests/analysis reports exist and conclude that the MCR and RSS lighting fixtures can withstand seismic design basis loads without affecting plant safety functions. b. Inspection reports exist and conclude that the as-built installed MCR and RSS lighting fixtures including anchorage are installed as specified on the construction drawings. |
| 3.1 | Emergency lighting in the MCR and RSS is powered from the EPSS. | A test will be performed. | <ul style="list-style-type: none"> a. The emergency lighting system provides lighting in the MCR and is powered from the EPSS. b. The emergency lighting system provides lighting in the RSS and is powered from the EPSS. |
| 3.2 | Special emergency lighting in the MCR and RSS is powered by the EUPS. | A test will be performed. | <ul style="list-style-type: none"> a. The special emergency lighting system provides lighting in the MCR and is powered from the EUPS. b. The special emergency lighting system provides lighting in the RSS and is powered from the EUPS. |

Table 2.5.9-1—Lighting System ITAAC (2 Sheets)

| Commitment Wording | | Inspections, Tests, Analyses | Acceptance Criteria |
|---------------------------|--|-------------------------------------|--|
| 3.3 | The emergency lighting and special emergency lighting sub-systems provide illumination at the MCR and RSS workstations and safety-related panels. | A test will be performed. | <ul style="list-style-type: none"> a. The emergency lighting and special emergency lighting sub-systems provide at least 100 foot-candles illumination at the MCR workstations and at least 50 foot-candles at the safety-related panels. b. The emergency lighting and special emergency lighting sub-systems provide at least 100 foot-candles illumination at the RSS workstations. |
| 3.4 | The special emergency lighting system provides at least ten foot-candles illumination at the MCR and RSS workstations. | A test will be performed. | <ul style="list-style-type: none"> a. The special emergency lighting system provides at least ten foot-candles at the MCR operator workstation when it is the only MCR lighting system in operation. b. The special emergency lighting system provides at least ten foot-candles at the RSS operator workstation when it is the only RSS lighting system in operation. |
| 3.5 | Eight-hour battery pack emergency lighting fixtures provide illumination for post-fire shutdown activities performed by operators outside the MCR or RSS where emergency diesel generator backed lighting is not credited. | A test will be performed. | Eight-hour battery pack emergency lighting fixtures provide at least one foot-candle for post-fire shutdown activities performed by operators outside the MCR or RSS where emergency diesel generator backed lighting is not credited. |

2.5.10 Normal Power Supply System

1.0 Description

The normal power supply system (NPSS) provides non-Class 1E power to non-safety-related loads including reactor coolant pumps (RCP) during normal operation.

2.0 Arrangement

2.1 The functional arrangement of NPSS equipment is shown in Figure 2.5.10-1—Normal Power Supply System Functional Arrangement.

2.2 Equipment identified as Class 1E in Table 2.5.10-1— Normal Power Supply System Electrical Equipment Design, are located as listed in Table 2.5.10-1.

3.0 Mechanical Design Features

3.1 Equipment listed as Class 1E in Table 2.5.10-1 are qualified as Seismic Category I and can withstand seismic design basis loads without loss of safety function.

4.0 I&C Design Features, Alarms, Displays and Controls

4.1 Displays listed in Table 2.5.10-1 are retrievable in the main control room (MCR) and remote shutdown station (RSS) as listed in Table 2.5.10-1.

4.2 NPSS equipment controls are provided in the MCR and RSS as listed in Table 2.5.10-1.

5.0 Electrical Considerations

5.1 Control power for the RCP circuit breakers listed in Table 2.5.10-1 is provided by the Class 1E uninterruptible power supply system (EUPS) from the same division.

5.2 Control power for the RCP switchgear source breakers listed in Table 2.5.10-1 is provided by the EUPS of a different division.

6.0 Equipment and System Performance

6.1 Deleted.

6.2 Each RCP switchgear source breaker trips open on a protection system signal.

7.0 Inspection, Tests, Analyses and Acceptance Criteria

Table 2.5.10-2—Normal Power Supply System ITAAC provides the ITAAC for the NPSS.

Table 2.5.10-1—Normal Power Supply System Electrical Equipment Design

| Equipment Description | IEEE Class 1E | Equipment Location | MCR / RSS Displays | MCR / RSS Controls |
|----------------------------------|----------------------|---------------------------|-------------------------------------|---------------------------|
| RCP #1 Switchgear Source Breaker | Yes | Safeguard Building 1 | Breaker position / Breaker position | Open / Open |
| RCP #2 Switchgear Source Breaker | Yes | Safeguard Building 2 | Breaker position / Breaker position | Open / Open |
| RCP #3 Switchgear Source Breaker | Yes | Safeguard Building 3 | Breaker position / Breaker position | Open / Open |
| RCP #4 Switchgear Source Breaker | Yes | Safeguard Building 4 | Breaker position / Breaker position | Open / Open |

**Table 2.5.10-2—Normal Power Supply System ITAAC
(2 Sheets)**

| Commitment Wording | | Inspections, Tests, Analyses | Acceptance Criteria |
|---------------------------|--|--|--|
| 2.1 | The functional arrangement of the NPSS is as shown on Figure 2.5.10-1. | An inspection will be performed. | The as-built NPSS conforms to the functional arrangement as shown in Figure 2.5.10-1. |
| 2.2 | Equipment identified as Class 1E in Table 2.5.10-1 are located as listed in Table 2.5.10-1. | An inspection will be performed. | The equipment listed as Class 1E in Table 2.5.10-1 are located as indicated in Table 2.5.10-1. |
| 3.1 | Equipment listed as Class 1E in Table 2.5.10-1 are qualified as Seismic Category I and can withstand seismic design basis loads without loss of safety function. | <ul style="list-style-type: none"> a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment listed as Class 1E in Table 2.5.10-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. Inspections will be performed of the as-installed Class 1E equipment listed in Table 2.5.10-1 to verify that the equipment including anchorage is installed as specified on the construction drawings. | <ul style="list-style-type: none"> a. Tests/analysis reports exist and conclude that the equipment listed as Class 1E in Table 2.5.10-1 can withstand seismic design basis loads without loss of safety function. b. Inspection reports exist and conclude that the as-installed Class 1E equipment listed in Table 2.5.10-1 including anchorage is installed as specified on the construction drawings. |
| 4.1 | Displays listed in Table 2.5.10-1 are retrievable in the MCR and RSS as listed in Table 2.5.10-1. | An inspection will be performed. | <ul style="list-style-type: none"> a. Displays listed in Table 2.5.10-1 as being retrieved in the MCR can be retrieved in the MCR. b. Displays listed in Table 2.5.10-1 as being retrieved in the RSS can be retrieved in the RSS. |
| 4.2 | NPSS equipment controls are provided in the MCR and the RSS as identified in Table 2.5.10-1. | A test will be performed. | <ul style="list-style-type: none"> a. Controls listed in Table 2.5.10-1 as being in the MCR exists in the MCR. b. Controls listed in Table 2.5.10-1 as being in the RSS exists in the RSS. |

**Table 2.5.10-2—Normal Power Supply System ITAAC
(2 Sheets)**

| Commitment Wording | | Inspections, Tests, Analyses | Acceptance Criteria |
|---------------------------|--|-------------------------------------|--|
| 5.1 | Control power for the RCP circuit breakers listed in Table 2.5.10-1 is provided by the EUPS from the same division. | A test will be performed. | Control power for the RCP circuit breakers listed in Table 2.5.10-1 is provided by the EUPS from the same division. |
| 5.2 | Control power for the RCP switchgear source breakers listed in Table 2.5.10-1 is provided by the EUPS of a different division. | A test will be performed. | Control power for the RCP switchgear source breakers listed in Table 2.5.10-1 is provided by the EUPS of a different division. |
| 6.1 | Deleted. | Deleted. | Deleted. |
| 6.2 | Each RCP switchgear source breaker trips open on a protection system signal. | A test will be performed. | Each RCP switchgear source breaker trips open on a protection system signal. |