

## **2.5.9 Lighting System**

### **1.0 Description**

The lighting system (LGT) includes the emergency lighting and special emergency lighting sub-systems. The emergency lighting system and special emergency lighting system fixtures are normally energized and combine to provide main control room (MCR) and remote shutdown station (RSS) lighting during normal and off normal operation. The lighting system is non-safety-related.

### **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 Deleted.

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 eight-hour battery pack emergency lighting fixtures are 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)**

<b>Commitment Wording</b>		<b>Inspections, Tests, Analyses</b>	<b>Acceptance Criteria</b>
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"> <li>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.</li> <li>b. Inspections will be performed to verify that the lighting fixtures including anchorage are installed as specified on the construction drawings.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>
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"> <li>a. The emergency lighting system provides lighting in the MCR and is powered from the EPSS.</li> <li>b. The emergency lighting system provides lighting in the RSS and is powered from the EPSS.</li> </ul>
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"> <li>a. The special emergency lighting system provides lighting in the MCR and is powered from the EUPS.</li> <li>b. The special emergency lighting system provides lighting in the RSS and is powered from the EUPS.</li> </ul>

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

<b>Commitment Wording</b>		<b>Inspections, Tests, Analyses</b>	<b>Acceptance Criteria</b>
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"> <li>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.</li> <li>b. The emergency lighting and special emergency lighting sub-systems provide at least 100 foot-candles illumination at the RSS workstations.</li> <li>c. 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.</li> <li>d. 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.</li> </ul>
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 eight-hour battery pack emergency lighting fixtures are utilized.	<ul style="list-style-type: none"> <li>a. An analysis will be performed to determine where operator post-fire shutdown actions are performed outside the MCR or RSS that credit eight-hour battery pack emergency lighting fixtures.</li> <li>b. A test will be performed.</li> </ul>	<ul style="list-style-type: none"> <li>a. Analysis identifies areas outside the MCR or RSS where operator post-fire shutdown actions require eight-hour battery pack emergency lighting fixtures.</li> <li>b. Eight-hour battery pack emergency lighting fixtures provide at least one foot-candle illumination.</li> </ul>

## **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 breaker located in the switchgear 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 switchgear feeder circuit breaker located in the switchgear 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 Deleted.

### **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**

<b>Description</b>	<b>IEEE Class 1E</b>	<b>Location</b>	<b>MCR / RSS Displays</b>	<b>MCR / RSS Controls</b>
13.8 kV Switchgear 31BDE	Yes	Safeguard Building 1	Breaker position / Breaker position	Open / Open
13.8 kV Switchgear 32BDE	Yes	Safeguard Building 2	Breaker position / Breaker position	Open / Open
13.8 kV Switchgear 33BDE	Yes	Safeguard Building 3	Breaker position / Breaker position	Open / Open
13.8 kV Switchgear 34BDE	Yes	Safeguard Building 4	Breaker position / Breaker position	Open / Open

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

<b>Commitment Wording</b>		<b>Inspections, Tests, Analyses</b>	<b>Acceptance Criteria</b>
2.1	The functional arrangement of the NPSS is as shown on Figure 2.5.10-1.	An inspection of the as-built system 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 listed 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"> <li>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.</li> <li>b. Inspections will be performed of the as-built 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.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>b. Inspection reports exist and conclude that the as-built Class 1E equipment listed in Table 2.5.10-1 including anchorage is installed as specified on the construction drawings.</li> </ul>
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.	A test will be performed.	<ul style="list-style-type: none"> <li>a. Displays listed in Table 2.5.10-1 as being retrieved in the MCR can be retrieved in the MCR.</li> <li>b. Displays listed in Table 2.5.10-1 as being retrieved in the RSS can be retrieved in the RSS.</li> </ul>
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"> <li>a. Controls listed in Table 2.5.10-1 as being in the MCR exists in the MCR.</li> <li>b. Controls listed in Table 2.5.10-1 as being in the RSS exists in the RSS.</li> </ul>

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

<b>Commitment Wording</b>		<b>Inspections, Tests, Analyses</b>	<b>Acceptance Criteria</b>
5.1	Control power for the RCP circuit breaker located in the switchgear 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 breaker located in the switchgear listed in Table 2.5.10-1 is provided by the EUPS from the same division.
5.2	Control power for the switchgear feeder circuit breaker located in the switchgear 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 switchgear feeder circuit breaker located in the switchgear listed in Table 2.5.10-1 is provided by the EUPS of a different division.
6.1	Deleted.	Deleted.	Deleted.
6.2	Deleted.	Deleted.	Deleted.

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