

2.4.2 Safety Information and Control System

1.0 Description

The SICS is provided as a safety-related HMI and is specifically designed to provide the operator with the necessary inventory of controls and indications for the following:

- Mitigation of anticipated operational occurrences (MCR).
- Mitigation of postulated accidents (MCR).
- Reach and maintain safe shutdown (MCR and RSS).
- Mitigation of anticipated operational occurrences concurrent with a software common cause failure of the PS (MCR).
- Mitigation of postulated accidents concurrent with a software common cause failure of the PS (MCR).
- Mitigation of severe accidents (MCR).

2.0 Arrangement

2.1 SICS equipment is located as listed in Table 2.4.2-1—Safety Information and Control System Equipment.

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2.3 Deleted.

2.4 Physical separation exists between Class 1E SICS equipment and non-Class 1E equipment.

2.5 Physical separation exists between the Class 1E electrical divisions that power the controls and indications of the SICS.

3.0 Mechanical Design Features

3.1 Equipment identified as Seismic Category I in Table 2.4.2-1 can withstand seismic design basis loads without loss of safety function.

4.0 I&C Design Features, Displays and Controls

4.1 The capability to transfer control of the SICS from the MCR to the RSS exists in a fire area separate from the MCR. The transfer switches are each associated with a single division of the safety-related control and allow transfer of control without entry into the MCR.

4.2 Electrical isolation exists between the Class 1E electrical divisions that power the controls and indications of the SICS.

4.3 Electrical isolation is provided on connections between the safety-related parts of the SICS and non-Class 1E equipment.

4.4 Class 1E SICS equipment can perform its safety function when subjected to electromagnetic interference (EMI), radio-frequency interference (RFI), electrostatic discharges (ESD), and power surges.

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4.6 Electrical isolation is provided on connections between the RSS and the MCR for the SICS.

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4.10 The SICS is designed so that safety-related functions required for an anticipated operational occurrence (AOO) or postulated accident (PA) are performed in the presence of the following:

- Single detectable failures within the SICS.
- Failures caused by the single failure.
- Failures and spurious system actions that cause or are caused by the AOO or PA requiring the safety function.

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5.0 Electrical Power Design Features

5.1 Class 1E SICS components are powered from a Class 1E division in a normal or alternate feed condition.

6.0 System Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.2-2 lists the SICS ITAAC.

Table 2.4.2-1—Safety Information and Control System Equipment

Description	Tag Number ⁽¹⁾	Location	Seismic Category	IEEE Class 1E ⁽²⁾
Hardwired I&C	N/A	MCR, RSS	I	(Note 2)

- 1) Equipment Tag numbers are provided for information and are not part of the design certification.
- 2) Controls and indications are powered by all four electrical divisions.

**Table 2.4.2-2—Safety Information and Control System ITAAC
(5 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	SICS equipment is located as listed in Table 2.4.2-1.	Inspection will be performed of the location of the SICS equipment.	The SICS equipment listed in Table 2.4.2-1 is located as listed in Table 2.4.2-1.
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2.3	Deleted.	Deleted.	Deleted.
2.4	Physical separation exists between Class 1E SICS equipment and non-Class 1E equipment.	<p>a. Design analyses will be performed to determine the required safety-related structures, separation distance, barriers, or any combination thereof to achieve adequate physical separation between Class 1E SICS equipment and non-Class 1E equipment.</p> <p>b. Inspections will be performed to verify that the required safety-related structures, separation distance, barriers, or any combination thereof exist between Class 1E SICS equipment and non-Class 1E equipment.</p>	<p>a. A report exists and defines the required safety-related structures, separation distance, barriers, or any combination thereof to achieve adequate physical separation between Class 1E SICS equipment and non-Class 1E equipment.</p> <p>b. The required safety-related structures, separation distance, barriers, or any combination thereof exist between Class 1E SICS equipment and non-Class 1E equipment.. Reconciliation is performed of any deviations to the design.</p>
2.5	Physical separation exists between the Class 1E electrical divisions that power the controls and indications of the SICS.	Inspections will be performed to verify that the Class 1E electrical divisions that power the controls and indications of the SICS are located in separate Safeguard Buildings.	The Class 1E electrical divisions that power the controls and indications of the SICS as listed in Table 2.4.2-1 are located in separate Safeguard Buildings.

**Table 2.4.2-2—Safety Information and Control System ITAAC
(5 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.1	Equipment identified as Seismic Category I in Table 2.4.2-1 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 Seismic Category I in Table 2.4.1-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. Inspections will be performed of the Seismic Category I equipment listed in Table 2.4.2-1 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 Seismic Category I in Table 2.4.1-1 can withstand seismic design basis loads without loss of safety function. b. Inspection reports exist and conclude that the Seismic Category I equipment listed in Table 2.4.2-1 including anchorage is installed as specified on the construction drawings.
4.1	The capability to transfer control of the SICS from the MCR to the RSS exists in a fire area separate from the MCR. The transfer switches are each associated with a single division of the safety-related control and allow transfer of control without entry into the MCR.	<ul style="list-style-type: none"> a. Inspections will be performed to verify the existence of procedures. b. Tests will be performed to verify that control of the SICS can be transferred from the MCR to the RSS. c. An inspection will be performed to verify the existence of the SICS RSS transfer switches in a fire area separate from the MCR, each associated with a single division of the safety-related control. 	<ul style="list-style-type: none"> a. A report exists and concludes that procedures exist for transfer of control of the SICS from the MCR to the RSS. b. A report exists and concludes that the test results confirm that control of the SICS can be transferred from the MCR to the RSS. c. Transfer switches exist in a fire area separate from the MCR, each associated with a single division of the safety-related control.

**Table 2.4.2-2—Safety Information and Control System ITAAC
(5 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.2	Electrical isolation exists between the Class 1E electrical divisions that power the controls and indications of the SICS.	Inspections will be performed to verify that the Class 1E electrical divisions that power the controls and indications of the SICS are electrically isolated from one another.	The Class 1E electrical divisions that power the controls and indications of the SICS as listed in Table 2.4.2-1 are electrically isolated from each another.
4.3	Electrical isolation is provided on connections between the safety-related parts of the SICS and non-Class 1E equipment.	<ul style="list-style-type: none"> a. Analyses will be performed to determine the test specification for electrical isolation devices on connections between the safety-related parts of the SICS and non-Class 1E equipment. b. Type tests, analyses, or a combination of type tests and analyses will be performed on the electrical isolation devices between the safety-related parts of the SICS and non-Class 1E equipment. c. Inspections will be performed on connections between the safety-related parts of the SICS and non-Class 1E equipment. 	<ul style="list-style-type: none"> a. A test plan exists that provides the test specification for determining whether a device is capable of preventing the propagation of credible electrical faults on connections between the safety-related parts of the SICS and non-Class 1E equipment. b. A report exists and concludes that the Class 1E isolation devices used between the safety-related parts of the SICS and non-Class 1E equipment. prevent the propagation of credible electrical faults. c. Class 1E electrical isolation devices exist on connections between the safety-related parts of the SICS and non-Class 1E equipment.
4.4	Class 1E SICS equipment can perform its safety function when subjected to EMI, RFI, ESD, and power surges.	Type tests or type tests and analysis of these will be performed for the Class 1E equipment listed in Table 2.4.1-1.	A report exists and concludes that the equipment identified as Class 1E in Table 2.4.2-1 can perform its safety function when subjected to EMI, RFI, ESD, and power surges.
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**Table 2.4.2-2—Safety Information and Control System ITAAC
(5 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.6	Electrical isolation is provided on connections between the RSS and the MCR for the SICS.	<p>a. Analyses will be performed to determine the test specification for electrical isolation devices on connections between the RSS and the MCR for the SICS.</p> <p>b. Type tests, analyses, or a combination of type tests and analyses will be performed on the electrical isolation devices between the RSS and the MCR for the SICS.</p> <p>c. Inspections will be performed on connections between the RSS and the MCR for the SICS.</p>	<p>a. A test plan exists that provides the test specification for determining whether a device is capable of preventing the propagation of credible electrical faults on connections between the RSS and the MCR for the SICS.</p> <p>b. A report exists and concludes that the Class 1E isolation devices used between the RSS and the MCR for the SICS prevent the propagation of credible electrical faults.</p> <p>c. Class 1E electrical isolation devices exist on connections between the RSS and the MCR for the SICS.</p>
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4.8	Deleted.	Deleted.	Deleted.
4.9	Deleted.	Deleted.	Deleted.
4.10	<p>The SICS is designed so that safety-related functions required for an AOO or PA are performed in the presence of the following:</p> <ul style="list-style-type: none"> • Single detectable failures within the SICS. • Failures caused by the single failure. • Failures and spurious system actions that cause or are caused by the AOO or PA requiring the safety function. 	A failure modes and effects analysis will be performed on the SICS at the level of replaceable modules and components.	<p>A report exists and concludes that the SICS is designed so that safety-related functions required for an AOO or PA are performed in the presence of the following:</p> <ul style="list-style-type: none"> • Single detectable failures within the SICS. • Failures caused by the single failure. • Failures and spurious system actions that cause or are caused by the AOO or PA requiring the safety function.
4.11	Deleted.	Deleted.	Deleted.

**Table 2.4.2-2—Safety Information and Control System ITAAC
(5 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
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4.14	Deleted.	Deleted.	Deleted.
4.15	Deleted.	Deleted.	Deleted.
4.16	Deleted.	Deleted.	Deleted.
5.1	Class 1E SICS components are powered from a Class 1E division in a normal or alternate feed condition.	<ul style="list-style-type: none"> a. Testing will be performed for components identified as Class 1E in Table 2.4.2-1 by providing a test signal in each normally aligned division. b. Testing will be performed for components identified as Class 1E in Table 2.4.2-1 by providing a test signal in each division with the alternate feed aligned to the divisional pair. 	<ul style="list-style-type: none"> a. The test signal provided in the normally aligned division is present at the respective Class 1E components identified in Table 2.4.2-1. b. The test signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E components identified in Table 2.4.2-1.

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