

2.4.25 Signal Conditioning and Distribution System

Design Description

1.0 System Description

The signal conditioning and distribution system (SCDS) provides signal conditioning and distribution of signals.

The SCDS provides the following safety-related functions:

- Receives safety-related signals from Class 1E sensors or black boxes.
- Sends safety-related signals to the protection system (PS) and safety automation system (SAS).
- Sends Type A, B and C post accident monitoring variable signals to the safety information and control system (SICS).

2.0 Arrangement

- 2.1 Deleted.
- 2.2 Physical separation exists between the divisions of the SCDS as listed in Table 2.4.25-1.
- 2.3 Physical separation exists between Class 1E SCDS equipment and non-Class 1E equipment.

3.0 Mechanical Design Features

- 3.1 Equipment identified as Seismic Category I in Table 2.4.25-1 can withstand seismic design basis loads without a loss of safety function(s).

4.0 I&C Design Features, Displays, and Controls

- 4.1 The SCDS receives input signals from the sources listed in Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals.
- 4.2 The SCDS provides output signals to the recipients listed in Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals.
- 4.3 Bypassed or inoperable SCDS status information is indicated on the PICS operator workstations in the MCR.
- 4.4 Electrical isolation is provided on connections between Class 1E SCDS equipment and non-Class 1E equipment to prevent the propagation of credible electrical faults.
- 4.5 Class 1E SCDS equipment listed in Table 2.4.25-1 can perform its safety function when subjected to electromagnetic interference (EMI), radio-frequency interference (RFI), electrostatic discharges (ESD), and power surges.

- 4.6 Locking mechanisms are provided on the SCDS cabinet doors. SCDS cabinet doors that are not closed are indicated on the PICS operator workstations in the MCR.
- 4.7 The SCDS 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 SCDS concurrent with identifiable but non-detectable failures.
 - 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.

5.0 Electrical Power Design Features

- 5.1 Equipment designated as Class 1E in Table 2.4.25-1 are powered from the Class 1E division as listed in Table 2.4.25-1 in a normal or alternate feed condition.

6.0 Environmental Qualifications

- 6.1 Equipment designated as mild environment in Table 2.4.25-1 can perform their function under normal environmental conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.25-4 lists the SCDS ITAAC.

Table 2.4.25-1—Signal Conditioning and Distribution System Equipment

Description	Tag Number⁽¹⁾	Location	Seismic Category	IEEE Class 1E⁽²⁾	Environment
SCDS Cabinets, Division 1	30CLE51	Safeguard Building 1	I	1 ^N 2 ^A	Mild
SCDS Cabinets, Division 2	30CLF51	Safeguard Building 2	I	2 ^N 1 ^A	Mild
SCDS Cabinets, Division 3	30CLG51	Safeguard Building 3	I	3 ^N 4 ^A	Mild
SCDS Cabinets, Division 4	30CLH51	Safeguard Building 4	I	4 ^N 3 ^A	Mild

1. Equipment Tag numbers are provided for information and are not part of the design certification.
2. ^N denotes the division the equipment is normally powered from. ^A denotes the division the equipment is powered from when alternate feed is implemented.

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals
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Item #	Signal	Source	# Divisions
1	6.9 kV Bus Voltage	Emergency Power Supply System	4
2	Annulus Ventilation System Gamma Activity	Annulus Ventilation System	4
3	Chemical and Volume Control System (CVCS) Boron Concentration	Boron Concentration and Measurement System	4
4	Cold Leg Temperature (NR)	Reactor Coolant System	4
5	Cold Leg Temperature (WR)	Reactor Coolant System	4
6	Containment Equipment Compartment Pressure	Containment Ventilation System	4
7	Containment Equipment Compartment Containment Service Compartment Delta Pressure	Containment Ventilation System	4
8	Containment High Range Activity	Radiation Monitoring System	4
9	Containment Service Compartment Pressure (NR)	Containment Ventilation System	4
10	Containment Service Compartment Pressure (WR)	Containment Ventilation System	4
11	Core Outlet Thermocouples Wide Range Temperature	Incore Instrumentation System	4
12	CVCS Charging Flow	Chemical Volume and Control System	4
13	RCP Differential Pressure	Reactor Coolant System	4
14	Emergency Feedwater Pump Discharge Flow	Emergency Feedwater System	4
15	Hot Leg Pressure (NR)	Safety Injection & Residual Heat Removal System	4
16	Hot Leg Pressure (WR)	Safety Injection & Residual Heat Removal System	4
17	Hot Leg Temperature (NR)	Reactor Coolant System	4
18	Hot Leg Temperature (WR)	Reactor Coolant System	4
19	Low Head Safety Injection Flow (WR)	Safety Injection and Residual Heat Removal System	4
20	Main Control Room (MCR) Air Intake Activity	Sampling Activity Monitoring Systems	4
21	Main Steam Line Activity	Main Steam System	4

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals
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Item #	Signal	Source	# Divisions
22	Medium Head Safety Injection Flow (WR)	Safety Injection and Residual Heat Removal System	4
23	Neutron Flux from Intermediate Range Detector (IRD)	Excure Instrumentation System	4
24	Neutron Flux from Power Range Detector (PRD)	Excure Instrumentation System	4
25	Neutron Flux from Self Powered Neutron Detectors (SPND)	Incore Instrumentation System	4
26	Neutron Flux from Source Range (SRD)	Excure Instrumentation System	4
27	Pressurizer Level (NR)	Reactor Coolant System	4
28	Pressurizer Pressure (NR)	Reactor Coolant System	4
29	RCP Bus Breaker Position	Normal Power Supply System	4
30	RCP Breaker Position	Normal Power Supply System	4
31	RCS Loop Flow	Reactor Coolant System	4
32	RCS Loop Level	Reactor Coolant System	4
33	RCP Speed	Reactor Coolant System	4
34	SG Level (NR)	Reactor Coolant System	4
35	SG Level (WR)	Reactor Coolant System	4
36	SG Pressure	Main Steam System	4
37	Temperature compensated rod cluster control assembly (RCCA) positions	Rod Position Measurement System	4
38	Reactor Trip Contactor Position	Control Rod Drive Control System	4
39	Containment Hydrogen Concentration	Hydrogen Monitoring System	2
40	Core Outlet Temperature	Incore Instrumentation System	4
41	AVS Temperature	Annulus Ventilation System	2
42	AVS Isolation Damper Position	Annulus Ventilation System	2
43	AVS Heater Fan Signal	Annulus Ventilation System	2
44	AVS Pressure	Annulus Ventilation System	2
45	AVS Differential Pressure	Annulus Ventilation System	2
46	AVS Post Heater Temperature	Annulus Ventilation System	2
47	AVS Filter Bank Isolation Inlet Damper Position	Annulus Ventilation System	2
48	AVS Filter Bank Isolation Outlet Damper Position	Annulus Ventilation System	2

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals
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Item #	Signal	Source	# Divisions
49	AVS Exhaust Fan Signal	Annulus Ventilation System	2
50	ESWS Pump Discharge Pressure	Essential Service Water System	4
51	CCWS Pump Discharge Pressure	Component Cooling Water System	4
52	CCWS Flow Rate	Component Cooling Water System	4
53	CCWS Heat Exchanger Temp	Component Cooling Water System	4
54	CCWS Heat Exchanger Bypass Valve Position	Component Cooling Water System	4
55	CCWS Surge Tank Level	Component Cooling Water System	4
56	OCWS Chiller Inlet Flow	Component Cooling Water System	4
57	OCWS Chiller Outlet Flow	Component Cooling Water System	4
58	CCWS Common Supply Outlet Flow	Component Cooling Water System	4
59	CCWS Common Supply Inlet Flow	Component Cooling Water System	4
60	CCWS Common 1a Supply Valve Position	Component Cooling Water System	2
61	CCWS Common 1a Return Valve Position	Component Cooling Water System	2
62	CCWS Common 1b Supply Valve Position	Component Cooling Water System	2
63	CCWS Common 1b Return Valve Position	Component Cooling Water System	2
64	CCWS Common 1b Return Outer CIV Position	Component Cooling Water System	2
65	CCWS Common 1b Supply Outer CIV Position	Component Cooling Water System	2
66	CCWS Common 2b Return Outer CIV Position	Component Cooling Water System	2
67	CCWS Common 2b Supply Outer CIV Position	Component Cooling Water System	2
68	CCWS Common 1b Return Inner CIV Position	Component Cooling Water System	2

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals
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Item #	Signal	Source	# Divisions
69	CCWS Common 1b Supply Inner CIV Position	Component Cooling Water System	2
70	CCWS Common 2b Return Inner CIV Position	Component Cooling Water System	2
71	CCWS Common 2b Supply Inner CIV Position	Component Cooling Water System	2
72	SCWS Condenser Refrigerant Pressure	Component Cooling Water System	2
73	Deleted	Deleted	Deleted
74	ESW Outside Air Temperature	Essential Service Water Pump Building Ventilation System	4
75	FBVS Room Temperature	Fuel Building Ventilation Room Temperature System	2
76	EBS / FPCS Recirculation Temperature	Fuel Building Ventilation Room Temperature System	2
77	Spent Fuel Pool Level (WR)	Fuel Pool Cooling and Purification System	2
78	IRWST Level	In-Containment Refueling Water Storage Tank System	4
79	CRACS Carbon Filter Isolation Damper Position	Main Control Room Air Conditioning System	2
80	CRACS Protective Switch Temperature	Main Control Room Air Conditioning System	2
81	CRACS ESF Filtration Fan Status	Main Control Room Air Conditioning System	2
82	CRACS Downstream Temperature	Main Control Room Air Conditioning System	2
83	CRACS Inlet Damper Position	Main Control Room Air Conditioning System	2
84	CRACS Outlet Damper Position	Main Control Room Air Conditioning System	2
85	MCR Differential Pressure	Main Control Room Air Conditioning System	2
86	CRACS Supply Air Temperature	Main Control Room Air Conditioning System	4
87	MSRIV Position	Main Steam System	4
88	MSRCV Position	Main Steam System	4

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals
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Item #	Signal	Source	# Divisions
89	LHSI Pump Room Temperature	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
90	MHSI Pump Room Temperature	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
91	LHSI/RHR Pump Running Signal	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
92	LHSI/RHR Pump Stopped Signal	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
93	MHSI Pump Running Signal	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
94	MHSI Pump Stopped Signal	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
95	CCWS/EFWS Valve Room Temperature	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
96	SBVSE Supply Air Temperature Downstream of Heaters	Electrical Division of Safeguard Building Ventilation System	4
97	SBVSE Protective Switch Temperature	Electrical Division of Safeguard Building Ventilation System	4
98	SBVSE Outside Air Temperature	Electrical Division of Safeguard Building Ventilation System	4
99	SBVSE Outside Air Damper Open Position Signal	Electrical Division of Safeguard Building Ventilation System	4
100	SBVSE Outside Air Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
101	SBVSE Exhaust Damper Open Position Signal	Electrical Division of Safeguard Building Ventilation System	4
102	SBVSE Exhaust Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
103	SBVSE Recirculation Damper Open Position Signal	Electrical Division of Safeguard Building Ventilation System	4
104	SBVSE Recirculation Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals
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Item #	Signal	Source	# Divisions
105	SBVSE Recirculation / Exhaust Fan Stopped Signal	Electrical Division of Safeguard Building Ventilation System	4
106	SBVSE Outside Air Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
107	SBVSE Recirculation Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
108	SBVSE Exhaust Fan Exhaust Damper Closed Position	Electrical Division of Safeguard Building Ventilation System	4
109	Filter Bank Differential Pressure	Electrical Division of Safeguard Building Ventilation System	4
110	Supply Air Downstream of Humidifier Temperature	Electrical Division of Safeguard Building Ventilation System	4
111	Battery Room Supply Air Downstream of Heaters Flow	Electrical Division of Safeguard Building Ventilation System	4
112	Battery Room Temperature	Electrical Division of Safeguard Building Ventilation System	4
113	Battery Room Supply Air Temperature	Electrical Division of Safeguard Building Ventilation System	4
114	EFWS Pump Room Temperature	Electrical Division of Safeguard Building Ventilation System	4
115	CCWS Pump Room Temperature	Electrical Division of Safeguard Building Ventilation System	4
116	SCWS Chiller Evaporator Outlet Temperature	Safety Chilled Water System	4
117	Deleted	Deleted	Deleted
118	SCWS Condenser Refrigerant Pressure	Safety Chilled Water System	4
119	SCWS Chiller Evaporator Flow Signal	Safety Chilled Water System	4
120	SCWS Cross-Tie Valves Position Signal	Safety Chilled Water System	4
121	SCWS Circulating Pump 1 Running Signal	Safety Chilled Water System	4
122	SCWS Circulating Pump 2 Running Signal	Safety Chilled Water System	4
123	SCWS Evaporator ΔP Signal	Safety Chilled Water System	4
124	SCWS Chiller Evaporator Flow Signal	Safety Chilled Water System	4
125	RHRS Flow Rate Signal	Safety Injection and Residual Heat Removal System	4

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals
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Item #	Signal	Source	# Divisions
126	RHRS Temperature	Safety Injection and Residual Heat Removal System	4
127	RHRS Pump Discharge Pressure	Safety Injection and Residual Heat Removal System	4
128	Hot Leg Loop Level	Safety Injection and Residual Heat Removal System	4
129	Containment Isolation Signal	Fuel Building Ventilation System	4
130	LHSI Suction Isolation Valve Position	Safety Injection and Residual Heat Removal System	4
131	RHR 1st RCPB Isolation Valve Position	Safety Injection and Residual Heat Removal System	4
132	RHR 2nd RCPB Isolation Valve Position	Safety Injection and Residual Heat Removal System	4
133	RHR Outside Containment Isolation Valve Position	Safety Injection and Residual Heat Removal System	4
134	LHSI Hot Leg Injection Isolation Valve Position	Safety Injection and Residual Heat Removal System	4
135	CCWS Common 2a Supply Valve Position	Component Cooling Water System	2
136	CCWS Common 2a Return Valve Position	Component Cooling Water System	2
137	CCWS Common 2b Supply Valve Position	Component Cooling Water System	2
138	CCWS Common 2b Return Valve Position	Component Cooling Water System	2
139	Steam Generator Transfer Valve Position	Steam Generator Blowdown System	4

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals
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Item #	Signal	Recipient	# Divisions
1	6.9 kV Bus Voltage	Protection System	4
2	Annulus Ventilation System Gamma Activity	Safety Information and Control System	4
3	Chemical and Volume Control System (CVCS) Boron Concentration	Protection System	4
4	Cold Leg Temperature (NR)	Protection System	4
5	Cold Leg Temperature (WR)	Protection System Safety Information and Control System	4
6	Containment Equipment Compartment Pressure	Protection System	4
7	Containment Equipment Compartment Containment Service Compartment Delta Pressure	Protection System Diverse Actuation System	4
8	Containment High Range Activity	Protection System Diverse Actuation System Safety Information and Control System	4
9	Containment Service Compartment Pressure (NR)	Protection System Diverse Actuation System	4
10	Containment Service Compartment Pressure (WR)	Protection System Safety Information and Control System	4
11	Core Outlet Thermocouples Wide Range Temperature	Safety Information and Control System	4
12	CVCS Charging Flow	Protection System	4
13	RCP Differential Pressure	Protection System	4
14	Emergency Feedwater Pump Discharge Flow	Safety Automation System Safety Information and Control System	4
15	Hot Leg Pressure (NR)	Protection System	4
16	Hot Leg Pressure (WR)	Protection System Safety Information and Control System Diverse Actuation System	4
17	Hot Leg Temperature (NR)	Protection System	4
18	Hot Leg Temperature (WR)	Protection System, Safety Information and Control System	4
19	Low Head Safety Injection Flow (WR)	Safety Information and Control System	4

**Table 2.4.25-3—Signal Conditioning and Distribution System Output
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Item #	Signal	Recipient	# Divisions
20	Main Control Room (MCR) Air Intake Activity	Protection System	4
21	Main Steam Line Activity	Protection System Safety Information and Control System	4
22	Medium Head Safety Injection Flow (WR)	Safety Information and Control System	4
23	Neutron Flux from Intermediate Range Detector (IRD)	Protection System Safety Information and Control System	4
24	Neutron Flux from Power Range Detector (PRD)	Protection System Diverse Actuation System	4
25	Neutron Flux from Self Powered Neutron Detectors (SPND)	Protection System	4
26	Neutron Flux from Source Range (SRD)	Safety Information and Control System	4
27	Pressurizer Level (NR)	Protection System	4
28	Pressurizer Pressure (NR)	Protection System Safety Information and Control System Diverse Actuation System	4
29	RCP Bus Breaker Position	Protection System	4
30	RCP Breaker Position	Protection System	4
31	RCS Loop Flow	Protection System Diverse Actuation System	4
32	RCS Loop Level	Protection System	4
33	RCP Speed	Protection System	4
34	SG Level (NR)	Protection System Diverse Actuation System	4
35	SG Level (WR)	Protection System Diverse Actuation System Safety Information and Control System, Safety Automation System	4
36	SG Pressure	Protection System Safety Information and Control System Safety Automation System Diverse Actuation System	4

**Table 2.4.25-3—Signal Conditioning and Distribution System Output
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Item #	Signal	Recipient	# Divisions
37	Temperature compensated rod cluster control assembly (RCCA) positions	Protection System	4
38	Reactor Trip Contactor Position	Protection System	4
39	Containment Hydrogen Concentration	Protection System	2
40	Core Outlet Temperature	Protection System	4
41	AVS Temperature	Safety Automation System	2
42	AVS Isolation Damper Position	Safety Automation System	2
43	AVS Heater Fan Signal	Safety Automation System	2
44	AVS Pressure	Safety Automation System	2
45	AVS Differential Pressure	Safety Automation System	2
46	AVS Post Heater Temperature	Safety Automation System	2
47	AVS Filter Bank Isolation Inlet Damper Position	Safety Automation System	2
48	AVS Filter Bank Isolation Outlet Damper Position	Safety Automation System	2
49	AVS Exhaust Fan Signal	Safety Automation System	2
50	ESWS Pump Discharge Pressure	Safety Automation System	4
51	CCWS Pump Discharge Pressure	Safety Automation System	4
52	CCWS Flow Rate	Safety Automation System	4
53	CCWS Heat Exchanger Temp	Safety Automation System	4
54	CCWS Heat Exchanger Bypass Valve Position	Safety Automation System	4
55	CCWS Surge Tank Level	Safety Automation System	4
56	OCWS Chiller Inlet Flow	Safety Automation System	4
57	OCWS Chiller Outlet Flow	Safety Automation System	4
58	CCWS Common Supply Outlet Flow	Safety Automation System	4
59	CCWS Common Supply Inlet Flow	Safety Automation System	4

**Table 2.4.25-3—Signal Conditioning and Distribution System Output
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Item #	Signal	Recipient	# Divisions
60	CCWS Common 1a Supply Valve Position	Safety Automation System	4
61	CCWS Common 1a Return Valve Position	Safety Automation System	4
62	CCWS Common 1b Supply Valve Position	Safety Automation System	4
63	CCWS Common 1b Return Valve Position	Safety Automation System	4
64	CCWS Common 1b Return Outer CIV Position	Safety Automation System	2
65	CCWS Common 1b Supply Outer CIV Position	Safety Automation System	2
66	CCWS Common 2b Return Outer CIV Position	Safety Automation System	2
67	CCWS Common 2b Supply Outer CIV Position	Safety Automation System	2
68	CCWS Common 1b Return Inner CIV Position	Safety Automation System	2
69	CCWS Common 1b Supply Inner CIV Position	Safety Automation System	2
70	CCWS Common 2b Return Inner CIV Position	Safety Automation System	2
71	CCWS Common 2b Supply Inner CIV Position	Safety Automation System	2
72	SCWS Condenser Refrigerant Pressure	Safety Automation System	2
73	Deleted	Deleted	Deleted
74	ESW Outside Air Temperature	Safety Automation System	4
75	FBVS Room Temperature	Safety Automation System	2
76	EBS / FPCS Recirculation Temperature	Safety Automation System	2
77	Spent Fuel Pool Level (WR)	Safety Automation System	2
78	IRWST Level	Safety Automation System	4
79	CRACS Carbon Filter Isolation Damper Position	Safety Automation System	2
80	CRACS Protective Switch Temperature	Safety Automation System	2

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals
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Item #	Signal	Recipient	# Divisions
81	CRACS ESF Filtration Fan Status	Safety Automation System	2
82	CRACS Downstream Temperature	Safety Automation System	2
83	CRACS Inlet Damper Position	Safety Automation System	2
84	CRACS Outlet Damper Position	Safety Automation System	2
85	MCR Differential Pressure	Safety Automation System	2
86	CRACS Supply Air Temperature	Safety Automation System	4
87	MSRIV Position	Safety Automation System	4
88	MSRCV Position	Safety Automation System	4
89	LHSI Pump Room Temperature	Safety Automation System	4
90	MHSI Pump Room Temperature	Safety Automation System	4
91	LHSI/RHR Pump Running Signal	Safety Automation System	4
92	LHSI/RHR Pump Stopped Signal	Safety Automation System	4
93	MHSI Pump Running Signal	Safety Automation System	4
94	MHSI Pump Stopped Signal	Safety Automation System	4
95	CCWS/EFWS Valve Room Temperature	Safety Automation System	4
96	SBVSE Supply Air Temperature Downstream of Heaters	Safety Automation System	4
97	SBVSE Protective Switch Temperature	Safety Automation System	4
98	SBVSE Outside Air Temperature	Safety Automation System	4
99	SBVSE Outside Air Damper Open Position Signal	Safety Automation System	4
100	SBVSE Outside Air Damper Closed Position Signal	Safety Automation System	4
101	SBVSE Exhaust Damper Open Position Signal	Safety Automation System	4

**Table 2.4.25-3—Signal Conditioning and Distribution System Output
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Item #	Signal	Recipient	# Divisions
102	SBVSE Exhaust Damper Closed Position Signal	Safety Automation System	4
103	SBVSE Recirculation Damper Open Position Signal	Safety Automation System	4
104	SBVSE Recirculation Damper Closed Position Signal	Safety Automation System	4
105	SBVSE Recirculation / Exhaust Fan Stopped Signal	Safety Automation System	4
106	SBVSE Outside Air Damper Closed Position Signal	Safety Automation System	4
107	SBVSE Recirculation Damper Closed Position Signal	Safety Automation System	4
108	SBVSE Exhaust Fan Exhaust Damper Closed Position	Safety Automation System	4
109	Filter Bank Differential Pressure	Safety Automation System	4
110	Supply Air Downstream of Humidifier Temperature	Safety Automation System	4
111	Battery Room Supply Air Downstream of Heaters Flow	Safety Automation System	4
112	Battery Room Temperature	Safety Automation System	4
113	Battery Room Supply Air Temperature	Safety Automation System	4
114	EFWS Pump Room Temperature	Safety Automation System	4
115	CCWS Pump Room Temperature	Safety Automation System	4
116	SCWS Chiller Evaporator Outlet Temperature	Safety Automation System	4
117	Deleted	Deleted	Deleted
118	SCWS Condenser Refrigerant Pressure	Safety Automation System	4
119	SCWS Chiller Evaporator Flow Signal	Safety Automation System	4
120	SCWS Cross-Tie Valves Position Signal	Safety Automation System	4

**Table 2.4.25-3—Signal Conditioning and Distribution System Output
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Item #	Signal	Recipient	# Divisions
121	SCWS Circulating Pump 1 Running Signal	Safety Automation System	4
122	SCWS Circulating Pump 2 Running Signal	Safety Automation System	4
123	SCWS Evaporator ΔP Signal	Safety Automation System	4
124	SCWS Chiller Evaporator Flow Signal	Safety Automation System	4
125	RHRS Flow Rate Signal	Safety Automation System	4
126	RHRS Temperature	Safety Automation System	4
127	RHRS Pump Discharge Pressure	Safety Automation System	4
128	Hot Leg Loop Level	Safety Automation System	4
129	Containment Isolation Signal	Safety Automation System	4
130	LHSI Suction Isolation Valve Position	Protection System Safety Automation System	4
131	RHR 1st RCPB Isolation Valve Position	Protection System Safety Automation System	4
132	RHR 2nd RCPB Isolation Valve Position	Protection System Safety Automation System	4
133	RHR Outside Containment Isolation Valve Position	Protection System	4
134	LHSI Hot Leg Injection Isolation Valve Position	Protection System	4
135	Steam Generator Transfer Valve Position	Protection System	4

**Table 2.4.25-4—Signal Conditioning and Distribution System ITAAC
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Commitment Wording		Inspection, Tests, Analyses	Acceptance Criteria
2.1	Deleted.	Deleted.	Deleted.
2.2	Physical separation exists between the divisions of the SCDS as listed in Table 2.4.25-1.	An inspection will be performed to verify that the as-built divisions of the SCDS are located in separate Safeguard Buildings.	The divisions of the SCDS are located in separate Safeguard Buildings as listed in Table 2.4.25-1.
2.3	Physical separation exists between Class 1E SCDS equipment and non-Class 1E equipment.	<p>a. An analysis will be performed to determine the required safety-related structures, separation distance, barriers, or any combination thereof to achieve physical separation between as-built Class 1E SCDS equipment and as-built non-Class 1E equipment.</p> <p>b. An inspection will be performed to verify that the required safety-related structures, separation distance, barriers, or any combination thereof exist between as-built Class 1E SCDS equipment and as-built non-Class 1E equipment.</p>	<p>a. A report defines the required safety-related structures, separation distance, barriers, or any combination thereof to achieve physical separation between Class 1E SCDS 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 SCDS equipment and non-Class 1E equipment.</p>

**Table 2.4.25-4—Signal Conditioning and Distribution System ITAAC
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Commitment Wording		Inspection, Tests, Analyses	Acceptance Criteria
3.1	Equipment identified as Seismic Category I in Table 2.4.25-1 can withstand seismic design basis loads without a loss of safety function(s).	<p>a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.4.25-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements.</p> <p>b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.4.25-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition.</p>	<p>a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.4.25-1 can withstand seismic design basis loads without a loss of safety function(s).</p> <p>b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.4.25-1, including anchorage, are installed in a condition bounded by the tested or analyzed condition.</p>
4.1	The SCDS receives input signals from the sources listed in Table 2.4.25-2.	A test will be performed to verify that the SCDS receives input signals from the sources listed in Table 2.4.25-2 by the use of test input signals.	The SCDS receives the input signals from the sources listed in Table 2.4.25-2.
4.2	The SCDS provides output signals to the recipients listed in Table 2.4.25-3.	A test will be performed to verify that the SCDS provides output signals to the recipients listed in Table 2.4.25-3.	The SCDS provides output signals to the recipients listed in Table 2.4.25-3.
4.3	Bypassed or inoperable SCDS status information is indicated on the PICS operator workstations in the MCR.	A test will be performed to verify bypassed or inoperable status information is indicated on the PICS operator workstations in the MCR.	Bypassed or inoperable SCDS status information is indicated on the PICS operator workstations in the MCR.

**Table 2.4.25-4—Signal Conditioning and Distribution System ITAAC
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Commitment Wording		Inspection, Tests, Analyses	Acceptance Criteria
4.4	Electrical isolation is provided on connections between Class 1E SCDS equipment and non-Class 1E equipment to prevent the propagation of credible electrical faults.	<ul style="list-style-type: none"> a. Type tests, analyses, or a combination of type tests and analyses will be performed on the electrical isolation devices between Class 1E SCDS equipment and non-Class 1E equipment. b. An inspection will be performed on connections between as-built Class 1E SCDS equipment and non-Class 1E equipment. 	<ul style="list-style-type: none"> a. A report concludes that the Class 1E isolation devices used between Class 1E SCDS equipment and non-Class 1E equipment prevent the propagation of credible electrical faults. b. Class 1E electrical isolation devices exist on connections between Class 1E SCDS equipment and non-Class 1E equipment.
4.5	Class 1E SCDS equipment listed in Table 2.4.25-1 can perform its safety function when subjected to EMI, RFI, ESD, and power surges.	Type tests or type tests and analyses will be performed to demonstrate that the Class 1E SCDS equipment listed in Table 2.4.25-1 can perform its safety function when subjected to EMI, RFI, ESD, and power surges.	Equipment identified as Class 1E in Table 2.4.25-1 can perform its safety function when subjected to EMI, RFI, ESD, and power surges.
4.6	Locking mechanisms are provided on the SCDS cabinet doors. SCDS cabinet doors that are not closed are indicated on the PICS operator workstations in the MCR.	<ul style="list-style-type: none"> a. A test will be performed to verify that the locking mechanisms on the SCDS cabinet doors operate properly. b. A test will be performed to verify that SCDS cabinet doors that are not closed are indicated on the PICS operator workstations in the MCR. 	<ul style="list-style-type: none"> a. The locking mechanisms on the SCDS cabinet doors operate properly. b. SCDS cabinet doors that are not closed are indicated on the PICS operator workstations in the MCR.

**Table 2.4.25-4—Signal Conditioning and Distribution System ITAAC
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	Commitment Wording	Inspection, Tests, Analyses	Acceptance Criteria
4.7	<p>The SCDS 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 SCDS concurrent with identifiable but non-detectable failures. ● 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. 	<p>A failure modes and effects analysis will be performed on the SCDS at the level of replaceable modules and components.</p>	<p>A report concludes that the SCDS 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 SCDS concurrent with identifiable but non-detectable failures. ● 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.
5.1	<p>Equipment designated as Class 1E in Table 2.4.25-1 are powered from the Class 1E division as listed in Table 2.4.25-1 in a normal or alternate feed condition.</p>	<p>a. Testing will be performed by providing a test input signal in each normally aligned division.</p> <p>b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.</p>	<p>a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.4.25-1.</p> <p>b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in Table 2.4.25-1.</p>

**Table 2.4.25-4—Signal Conditioning and Distribution System ITAAC
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	Commitment Wording	Inspection, Tests, Analyses	Acceptance Criteria
6.1	<p>Equipment designated as mild environment in Table 2.4.25-1 can perform their function under normal environmental conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.</p>	<p>a. Type tests or type tests and analysis will be performed to demonstrate the ability of the equipment designated as mild environment in Table 2.4.25-1 to perform their function under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.</p> <p>b. An inspection will be performed of the as-built equipment designated as mild environment in Table 2.4.25-1 to verify that the equipment, including anchorage, are installed the associated cables, wiring, and terminations located in a mild environment, are bounded by the type test or combination of type tests and analyses.</p>	<p>a. EQDPs conclude that the equipment designated as mild environment in Table 2.4.25-1 can perform their function under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions, including the time required to perform the listed function.</p> <p>b. Inspection reports conclude that the equipment designated as mild environment in Table 2.4.25-1, including the associated cables, wiring, and terminations located in a mild environment, are bounded by the type test or combination of type tests and analyses.</p>