

2.4.11 Boron Concentration Measurement System

1.0 Description

The boron concentration measurement system measures the boron concentration in the chemical and volume control system (CVCS). The boron concentration measurement system signals are processed in four divisions of the protection system (PS).

The BCMS has the following safety-related function:

- Provides boron concentration measurements for the PS.

2.0 Arrangement

2.1 The BCMS equipment is located as listed in Table 2.4.11-1—Boron Concentration Measurement System Equipment.

3.0 Seismic 1 Classifications

3.1 Equipment identified as Seismic Category I in Table 2.4.11-1 can withstand seismic design basis loads without loss of safety function.

4.0 I&C Design Features, Displays and Controls

4.1 The BCMS provides output signals listed in Table 2.4.11-2—Boron Concentration Measurement System Output Signals.

4.2 The BCMS equipment classified as Class 1E in Table 2.4.11-1 can perform its safety function when subjected to electromagnetic interference (EMI), radio-frequency interference (RFI), electrostatic discharges (ESD), and power surges.

5.0 Electrical Power

5.1 The BCMS equipment identified as Class 1E in Table 2.4.11-1 receives power from its respective Class 1E division.

6.0 System Inspections, Tests, Analyses, and Acceptance Criteria

6.1 Table 2.4.11-3—Boron Concentration Measurement System ITAAC specifies the inspections, tests, analyses, and acceptance criteria for the BCMS.

Table 2.4.11-1—Boron Concentration Measurement System Equipment				
Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	Seismic Category I	IEEE Class 1E
Boron Concentration Sensor Division 1	30KBA34CQ857A	Fuel Building	Yes	Yes
Boron Concentration Sensor Division 2	30KBA34CQ857B	Fuel Building	Yes	Yes
Boron Concentration Sensor Division 3	30KBA34CQ858B	Fuel Building	Yes	Yes
Boron Concentration Sensor Division 4	30KBA34CQ858A	Fuel Building	Yes	Yes
Temperature Sensor Division 1	30KBA34CT857A	Fuel Building	Yes	Yes
Temperature Sensor Division 2	30KBA34CT857B	Fuel Building	Yes	Yes
Temperature Sensor Division 3	30KBA34CT858B	Fuel Building	Yes	Yes
Temperature Sensor Division 4	30KBA34CT858A	Fuel Building	Yes	Yes

- 1) Equipment tag numbers are provided for information and are not part of the design certification.

Table 2.4.11-2—Boron Concentration Measurement System Output Signals

Item #	Output Signal	Signal Generation	Recipient	# Divisions	IEEE Class 1E
1	Boron Concentration	Auto	PS	4	Yes
2	Fluid Temperature for Boron Concentration Measurement Correction	Auto	PS	4	Yes

**Table 2.4.11-3—Boron Concentration Measurement System
ITAAC**

Commitment Wording	Inspection, Analysis or Test	Acceptance Criteria
2.1 The BCMS equipment is located as listed in Table 2.4.11-1.	Inspections will be performed of the location of the BCMS equipment.	The equipment listed in Table 2.4.11-1 is located as listed in Table 2.4.11-1.
3.1 Equipment identified as Seismic Category I in Table 2.4.11-1 can withstand seismic design basis loads without loss of safety function.	Inspections, type tests, tests, analyses or a combination of tests and analyses will be performed on the equipment designated as Seismic Category I in Table 2.4.11-1.	(1) A report exists and concludes that the equipment listed as Seismic Category I in Table 2.4.11-1 is installed as designed. (2) A report exists and concludes that the equipment listed as Seismic Category I in Table 2.4.11-1 can withstand seismic design basis loads without loss of safety function.
4.1 The BCMS provides output signals listed in Table 2.4.11-2.	Tests will be performed to verify the existence of output signals.	The BCMS provides output signals to the recipients listed in Table 2.4.11-2.
4.2 The BCMS equipment classified as Class 1E in Table 2.4.11-1 can perform its safety function when subjected to EMI, RFI, ESD, and power surges.	Type tests, tests, analyses or a combination of these will be performed for the Class 1E equipment listed in Table 2.4.11-1.	A report exists and concludes that the equipment listed as Class 1E in Table 2.4.11-1 can perform its safety function when subjected to EMI, RFI, ESD, and power surges.
5.1 The equipment identified as Class 1E in Table 2.4.11-1 receives power from its respective Class 1E division.	Inspections will be performed to verify the source of power for Class 1E equipment.	The Class 1E equipment listed in Table 2.4.11-1 is powered from its respective Class 1E divisions.