

2.9.4 Sampling Activity Monitoring System

Design Description

1.0 System Description

The sampling activity monitoring system (SAMS) provides the following safety-related function:

- Provides a radioactivity indication that initiates isolation of the main control room (MCR) ventilation intake.

The SAMS provides the following non-safety-related function:

- Provides ventilation stack radiation monitoring indication in the MCR and remote shutdown station (RSS).
- Supports reactor coolant pressure boundary (RCPB) leakage detection.

2.0 Arrangement

2.1 The functional arrangement of the SAMS is as described in the Design Description of Section 2.9.4, Tables 2.9.4-1—Sampling Activity Monitoring System Equipment Mechanical Design and 2.9.4-2—Sampling Activity Monitoring System Equipment I&C and Electrical Design, and as shown on Figure 2.9.4-1—Sampling Activity Monitoring System Functional Arrangement.

2.2 Deleted.

3.0 Mechanical Design Features

3.1 Equipment identified as Seismic Category I in Table 2.9.4-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.9.4-1.

4.0 Displays and Controls

4.1 Deleted.

4.2 Displays listed in Table 2.9.4-1 are indicated on the PICS operator workstations in the MCR.

4.3 The Reactor Building radiation monitor supports RCPB leakage detection.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E in Table 2.9.4-2 are powered from a Class 1E division in a normal or alternate feed condition.

6.0 Equipment and System Performance

- 6.1 MCR Ventilation Intake Radioactivity Monitors listed in Table 2.9.4-1 initiate isolation of the MCR ventilation and initiation of supplemental filtration upon receipt of high radioactivity signal.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.9.4-3—lists the sampling activity monitoring system ITAAC.

Table 2.9.4-1—SAMS Equipment Mechanical Design

Description	Tag Number ⁽¹⁾	Location	Function	Seismic Category
MCR Ventilation Intake Radioactivity Monitor	30KLK65CR001	Safeguard Building 2	Indicate Radioactivity Levels	I
MCR Ventilation Intake Radioactivity Monitor	30KLK65CR002	Safeguard Building 2	Indicate Radioactivity Levels	I
MCR Ventilation Intake Radioactivity Monitor	30KLK66CR001	Safeguard Building 3	Indicate Radioactivity Levels	I
MCR Ventilation Intake Radioactivity Monitor	30KLK66CR002	Safeguard Building 3	Indicate Radioactivity Levels	I
Ventilation Stack Radioactivity Monitor	30KLK95CR001	Vent Stack	Indicate Radioactivity Levels	Non-Seismic
Ventilation Stack Radioactivity Monitor	30KLK95CR002	Vent Stack	Indicate Radioactivity Levels	Non-Seismic
Reactor Building Radioactivity Monitor	30KLK05CR031	Reactor Building	Indicate Radioactivity Levels	I

- Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.9.4-2—SAMS Equipment I&C and Electrical Design

Description	Tag Number ⁽¹⁾	Location	IEEE Class 1E Source ⁽²⁾
MCR Ventilation Intake Radioactivity Monitor	30KLK65CR001	Safeguard Building 2	Yes
MCR Ventilation Intake Radioactivity Monitor	30KLK65CR002	Safeguard Building 2	Yes
MCR Ventilation Intake Radioactivity Monitor	30KLK66CR001	Safeguard Building 3	Yes
MCR Ventilation Intake Radioactivity Monitor	30KLK66CR002	Safeguard Building 3	Yes
Ventilation Stack Radioactivity Monitor	30KLK95CR001	Vent Stack	Yes
Ventilation Stack Radioactivity Monitor	30KLK95CR002	Vent Stack	Yes

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Table 2.9.4-3—Sampling Activity Monitoring System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the sampling activity monitoring system is as described in the Design Description of Section 2.9.4, Tables 2.9.4-1 and 2.9.4-2, and as shown on Figure 2.9.4-1.	An inspection of the as-built sampling activity monitoring system functional arrangement will be performed.	The sampling activity monitoring system conforms to the functional arrangement as described in the Design Description of Section 2.9.4, Tables 2.9.4-1 and 2.9.4-2, and as shown on Figure 2.9.4-1.
2.2	Deleted.	Deleted.	Deleted.
3.1	Equipment identified as Seismic Category I in Table 2.9.4-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.9.4-1.	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 2.9.4-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.9.4-1 to verify that the equipment, including anchorage, are installed per the approved design requirements.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.9.4-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.9.4-1 including the time required to perform the listed function. b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.9.4-1, including anchorage, are installed per the approved design requirements.
4.1	Deleted.	Deleted.	Deleted.
4.2	Displays listed in Table 2.9.4-1 are indicated on the PICS operator workstations in the MCR.	Tests will be performed to verify that the displays listed in Table 2.9.4-1 are indicated on the PICS operator workstations in the MCR by using test input signals to PICS.	Displays listed in Table 2.9.4-1 are indicated on the PICS operator workstations in the MCR.

Table 2.9.4-3—Sampling Activity Monitoring System ITAAC
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Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.3	The Reactor Building radiation monitor supports RCPB leakage detection.	An analysis will be performed to verify that the sensitivity of the as built Reactor Building radiation monitor supports RCPB leakage detection.	A report concludes that the Reactor Building radiation monitor sensitivity of $3\text{E}-10$ $\mu\text{Ci/cc}$ correlates to an ability to detect a leakage increase of 1 gpm.
5.1	Equipment designated as Class 1E in Table 2.9.4-2 are powered from a Class 1E division in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division. b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Table 2.9.4-2. 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 2.9.4-2.
6.1	MCR Ventilation Intake Radioactivity Monitors listed in Table 2.9.4-1 initiate isolation of the MCR ventilation and initiation of supplemental filtration upon receipt of high radioactivity signal.	A test will be performed the MCR ventilation isolation and supplemental filtration is initiated receipt of high radioactivity test input signal.	The MCR Ventilation Intake Radioactivity monitors listed in Table 2.9.4-1 initiate MCR ventilation isolation and supplemental MCR filtration upon receipt of high radioactivity test input signal from the PACS module.