

2.9.4 Sampling Activity Monitoring System

1.0 Description

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

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

The sampling activity monitoring system 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 sampling activity monitoring system is shown on Figure 2.9.4-1—Sampling Activity Monitoring System Functional Arrangement.

2.2 The location of the sampling activity monitoring system equipment is as listed in Table 2.9.4-1—Sampling Activity Monitoring System Equipment Mechanical Design.

3.0 Mechanical Design Features

3.1 Components 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 Each monitor listed in Table 2.9.4-1 initiates a MCR alarm when radiation level exceeds a preset limit.

4.2 The sampling activity monitoring system provides ventilation stack radiation monitoring.

4.3 Reactor Building radiation level, which supports reactor coolant pressure boundary RCPB leakage detection, is indicated in the MCR.

5.0 Electrical Power Design Features

5.1 The components designated as Class 1E in Table 2.9.4-2—Sampling Activity Monitoring System Equipment I&C and Electrical Design 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 levels.

7.0 Inspections, Tests, Analyses, and Acceptance Criteria

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

Table 2.9.4-1—Sampling Activity Monitoring System Equipment Mechanical Design

Description	Tag Number ⁽¹⁾	Location	Function	Seismic Category
MCR Ventilation Intake Radioactivity Monitor	30KLL65CR001	Safeguard Building 2	Indicate Radioactivity Levels	I
MCR Ventilation Intake Radioactivity Monitor	30KLL65CR002	Safeguard Building 2	Indicate Radioactivity Levels	I
MCR Ventilation Intake Radioactivity Monitor	30KLL66CR001	Safeguard Building 3	Indicate Radioactivity Levels	I
MCR Ventilation Intake Radioactivity Monitor	30KLL66CR002	Safeguard Building 3	Indicate Radioactivity Levels	I
Ventilation Stack Radioactivity Monitor	30KLL95CR001	Vent Stack	Indicate Radioactivity Levels	Non-Seismic
Ventilation Stack Radioactivity Monitor	30KLL95CR002	Vent Stack	Indicate Radioactivity Levels	Non-Seismic
Reactor Building Radioactivity Monitor	30KLL05CR031	Reactor Building	Indicate Radioactivity Levels	I

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

**Table 2.9.4-2—Sampling Activity Monitoring System
Equipment I&C and Electrical Design**

Description	Tag Number ⁽¹⁾	Location	IEEE Class 1E Source ⁽²⁾
MCR Ventilation Intake Radioactivity Monitor	30KLLK65CR001	Safeguard Building 2	Yes
MCR Ventilation Intake Radioactivity Monitor	30KLLK65CR002	Safeguard Building 2	Yes
MCR Ventilation Intake Radioactivity Monitor	30KLLK66CR001	Safeguard Building 3	Yes
MCR Ventilation Intake Radioactivity Monitor	30KLLK66CR002	Safeguard Building 3	Yes
Ventilation Stack Radioactivity Monitor	30KLLK95CR001	Vent Stack	Yes
Ventilation Stack Radioactivity Monitor	30KLLK95CR002	Vent Stack	Yes

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

**Table 2.9.4-3—Sampling Activity Monitoring System ITAAC
(3 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the sampling activity monitoring system is as shown on Figure 2.9.4-1.	Inspections of the as-built system as shown on Figure 2.9.4-1 will be conducted.	The as-built sampling activity monitoring system conforms with the functional arrangement as shown on Figure 2.9.4-1.
2.2	The location of the sampling activity monitoring system equipment is as listed in Table 2.9.4-1.	An inspection will be performed of the location of the equipment listed in Table 2.9.4-1.	The equipment listed in Table 2.9.4-1 is located as listed in Table 2.9.4-1.
3.1	Components 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.	<p>a. Type tests, analyses, or a combination of type tests and analyses will be performed on the components 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.</p> <p>b. Inspections will be performed of the Seismic Category I components identified in Table 2.9.4-1 to verify that the components, including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).</p>	<p>a. Seismic qualification reports (SQDP, EQDP, or analyses) exist and conclude that the Seismic Category I components identified 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.</p> <p>b. Inspection reports exist and conclude that the Seismic Category I components identified in Table 2.9.4-1, including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).</p>
4.1	Each monitor listed in Table 2.9.4-1 initiates a MCR alarm when the radiation level exceeds a preset limit.	A test will be performed to verify that the MCR alarm is initiated when radiation level exceeds a preset limit.	Each monitor listed in Table 2.9.4-1 initiates an MCR alarm when the radiation level exceeds a preset limit.

**Table 2.9.4-3—Sampling Activity Monitoring System ITAAC
(3 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.2	The sampling activity monitoring system provides ventilation stack radiation monitoring.	A test will be performed.	<ul style="list-style-type: none"> a. Ventilation stack radiation monitors listed in Table 2.9.4-1 and Table 2.9.4-2 provide ventilation stack radiation indication in the MCR. b. Ventilation stack radiation monitors listed in Table 2.9.4-1 and Table 2.9.4-2 provide ventilation stack radiation indication in the RSS.
4.3	Reactor Building radiation, which supports reactor coolant pressure boundary RCPB leakage detection, is indicated in the MCR.	<ul style="list-style-type: none"> a. A test will be performed to verify radiation level information in the MCR. b. An analysis will be performed to verify that the monitor sensitivity of 3E-10 $\mu\text{Ci/cc}$ correlates to an ability to detect a leakage increase of 1 gpm. 	<ul style="list-style-type: none"> a. Radiation level indication is provided in the MCR for the Reactor Building radiation monitor listed in Table 2.9.4-1. b. A report exists and concludes that the monitor sensitivity of 3E-10 $\mu\text{Ci/cc}$ correlates to an ability to detect a leakage increase of 1 gpm.
5.1	The components designated as Class 1E in Table 2.9.4-2 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 designated as Class 1E in Table 2.9.4-2 by providing a test signal in each normally aligned division. b. Testing will be performed for components designated as Class 1E in Table 2.9.4-2 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 component identified in Table 2.9.4-2. b. The test signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E component identified in Table 2.9.4-2.

**Table 2.9.4-3—Sampling Activity Monitoring System ITAAC
(3 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
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 levels.	A test will be performed to verify that the MCR ventilation isolation and supplemental filtration is initiated upon radiation levels exceeding a preset limit.	The monitors listed in Table 2.9.4-1 initiate MCR ventilation isolation and supplemental MCR filtration when radiation level exceeds a preset limit.

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