2.4.7 Seismic Monitoring System

1.0 Description

The seismic monitoring system (SMS) produces a record of the vibratory ground motion from various areas of the plant during an earthquake so that features important to safety can be evaluated after an earthquake. The SMS is capable of sensing and permanently recording the absolute acceleration versus time.

2.0 Arrangement

2.1 The SMS in-structure instrumentation is placed at locations modeled as mass points in the building dynamic analysis so that the measured motion can be directly compared with the design spectra. Field mounted sensors of the triaxial type (i.e., three-directional, x-y-z axes) are rigidly mounted at the following locations:

- Free-field, if a suitable location is available.
- The primary containment structure (base foundation and two higher elevations).
- An independent Seismic Category I structure (foundation and higher elevation) not influenced by or connected to the primary containment structure.

3.0 I&C Design Features, Displays and Controls

3.1 The SMS system can compute the cumulative absolute velocity (CAV) and provides indication of the CAV in the main control room (MCR).

3.2 The SMS has sufficient dynamic range.

3.3 The SMS has sufficient bandwidth.

3.4 The SMS has a sufficient sampling rate.

3.5 The SMS has a sufficient trigger level.

4.0 Electrical Power

4.1 The SMS backup battery has sufficient capacity to power its instruments for continuous operation for a period of time.

5.0 System Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.7-1 lists the SMS ITAAC.

Table 2.4.7-1—Seismic Monitoring System ITAAC

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The location of the SMS equipment is as described in Section 2.1.	Analyses will be performed to determine the location of the SMS equipment, and inspections will be performed of the location of the SMS equipment.	The SMS equipment is located as per the analyses.
3.1	The SMS system can compute the CAV and provides a display of the CAV in the MCR.	a. Type tests, tests, analyses, or a combination of analyses and tests will be performed on the SMS. b. Inspections will be performed for the existence or retrieve-ability of a display of CAV in the MCR.	a. The SMS can compute the CAV. b. Indication and alarms from CAV can be retrieved in the MCR.
3.2	The SMS has sufficient dynamic range.	Type tests, analyses or a combination of type tests and analyses of the SMS equipment will be performed.	The SMS has a dynamic range of at least 1000:1 zero-to-peak and is able to record at least 1.0 g zero-to-peak.
3.3	The SMS has sufficient bandwidth.	Type tests, analyses or a combination of type tests and analyses of the SMS equipment will be performed.	The SMS has bandwidth of at least 0.2 to 50 Hertz.
3.4	The SMS has a sufficient sampling rate.	Type tests, analyses or a combination of type tests and analyses of the SMS equipment will be performed.	The SMS has a sample rate of at least 200 samples per second in each of the three directions.
3.5	The SMS has a sufficient trigger rate.	Type tests, analyses or a combination of type tests and analyses of the SMS equipment will be performed.	The SMS has an actuating level that is adjustable and within the range of 0.001g and 0.02g.
4.1	The SMS backup battery has sufficient capacity to power its instruments for continuous operation for a period of time.	Type tests, analyses or a combination of type tests and analyses of the SMS equipment will be performed.	The SMS has a backup battery that has a capacity for a minimum of 25 minutes of system operation.

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