

2.4.16 Reactor Pressure Vessel Level Measurement System

1.0 Description

The reactor pressure vessel level (RPVL) measurement system provides an indication of the water level in the reactor vessel.

The RPVL measurement system has the following safety related functions:

- Provides indication of reactor vessel water level.

2.0 Arrangement

2.1 The RPVL measurement system equipment is located as listed in Table 2.4.16-1—Reactor Pressure Vessel Level Measurement System Equipment.

3.0 Mechanical Design Features

3.1 Equipment identified as Seismic Category I in Table 2.4.16-1 can withstand seismic design basis loads without loss of safety function.

4.0 I&C Design Features, Displays and Controls

4.1 The RPVL measurement system equipment classified as Class 1E in Table 2.4.16-1 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 Design Features

5.1 The components identified as Class 1E in Table 2.4.16-1 are powered from the Class 1E division as listed in Table 2.4.16-1 in a normal or alternate feed condition.

6.0 Environmental Considerations

6.1 Equipment listed as Class 1E in Table 2.4.16-1 that are designated as harsh environment will perform their safety function in the environments that exist before and during the time required to perform their safety function.

7.0 System Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.4.16-2 lists the RPVL ITAAC.

Table 2.4.16-1—Reactor Pressure Vessel Level Measurement System Equipment

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	Seismic Category	IEEE Class 1E ⁽²⁾	Harsh Environment
RPVL sensors, Division 1	30JKS10CL001 30JKS10CL002 30JKS10CL003	Reactor Vessel	I	1 ^N 2 ^A	Yes
RPVL sensors, Division 2	30JKS20CL001 30JKS20CL002 30JKS20CL003	Reactor Vessel	I	2 ^N 1 ^A	Yes
RPVL sensors, Division 3	30JKS30CL001 30JKS30CL002 30JKS30CL003	Reactor Vessel	I	3 ^N 4 ^A	Yes
RPVL sensors, Division 4	30JKS40CL001 30JKS40CL002 30JKS40CL003	Reactor Vessel	I	4 ^N 3 ^A	Yes
RPVL Conditioning Cabinet, Division 1	30CLE14GH001	Safeguard Building 1	I	1 ^N 2 ^A	No
RPVL Conditioning Cabinet, Division 2	30CLF14GH002	Safeguard Building 2	I	2 ^N 1 ^A	No
RPVL Conditioning Cabinet, Division 3	30CLG14GH003	Safeguard Building 3	I	3 ^N 4 ^A	No
RPVL Conditioning Cabinet, Division 4	30CLH14GH004	Safeguard Building 4	I	4 ^N 3 ^A	No

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

**Table 2.4.16-2—Reactor Pressure Vessel Level
Measurement System ITAAC
(2 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The RPVL measurement system equipment is located as listed in Table 2.4.16-1.	An inspection will be performed of the location of the RPVL measurement system equipment.	The equipment listed in Table 2.4.16-1 is located as listed in Table 2.4.16-1.
3.1	Equipment identified as Seismic Category I in Table 2.4.16-1 can withstand seismic design basis loads without loss of safety function.	<p>a. Type tests, analyses or a combination of type tests and analyses will be performed on the equipment listed as Seismic Category I in Table 2.4.16-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements.</p> <p>b. Inspections will be performed of the as-installed Seismic Category I equipment listed in Table 2.4.16-1 to verify that the equipment including anchorage is installed as specified on the construction drawings.</p>	<p>a. Tests/analysis reports exist and conclude that the equipment listed as Seismic Category I in Table 2.4.16-1 can withstand seismic design basis loads without loss of safety function.</p> <p>b. Inspection reports exist and conclude that the as-installed Seismic Category I equipment listed in Table 2.4.16-1 including anchorage is installed as specified on the construction drawings.</p>
4.1	The RPVL measurement system equipment classified as Class 1E in Table 2.4.16-1 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 2.4.16-1.	A report exists and concludes that the equipment listed as Class 1E in Table 2.4.16-1 can perform its safety function when subjected to EMI, RFI, ESD, and power surges.
5.1	The components identified as Class 1E in Table 2.4.16-1 are powered from the Class 1E division as listed in Table 2.4.16-1 in a normal or alternate feed condition.	a. Testing will be performed for components identified as Class 1E in Table 2.4.16-1 by providing a test signal in each normally aligned division.	a. The test signal provided in the normally aligned division is present at the respective Class 1E components identified in Table 2.4.16-1.

Table 2.4.16-2—Reactor Pressure Vessel Level Measurement System ITAAC (2 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
		b. Testing will be performed for components identified as Class 1E in Table 2.4.16-1 by providing a test signal in each division with the alternate feed aligned to the divisional pair.	b. The test signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E components identified in Table 2.4.16-1.
6.1	Equipment listed as Class 1E in Table 2.4.16-1 that are designated as harsh environment will perform their safety function in the environments that exist before and during the time required to perform their safety function.	Type tests, tests, analyses or a combination of tests and analyses will be performed to demonstrate the ability of the equipment to perform their safety function for the environmental conditions that could occur before and during a design basis accident.	A report exists and concludes that equipment listed as Class 1E in Table 2.4.16-1 are qualified to perform their associated safety function in the environments that exist before and during the time required to perform their safety function.