2.9.5 Nuclear Island Drain and Vent System

1.0 Description

The nuclear island drain and vent system (NIDVS) collects, temporarily stores, and transfers radioactive fluids from the nuclear island area to other plant systems in a controlled manner. Portions of the NIDVS are classified as safety-related. The NIDVS operates during normal power, start-up, and shutdown conditions.

The NIDVS provides the following safety-related functions:

- Provides alarms in the main control room (MCR) to indicate a flooding event.
- Trips the essential service water system (ESWS) pump and closes the ESWS pump discharge valve in a Safeguard Building (SB) flooding event.
- Supports reactor coolant pressure boundary (RCPB) leakage detection.

2.0 Arrangement

2.1 The location of the sump level sensors is as listed in Table 2.9.5-1—NIDVS Equipment I&C and Electrical Design.

3.0 Instrumentation and Controls (I&C) Design Features, Displays, and Controls

3.1 Displays listed in Table 2.9.5-1 are retrievable in the main control room (MCR).

3.2 The sump level sensor in a Safeguard Building trips the ESWS pump and closes the pump discharge valve in response to a flooding signal.

3.3 The sump has level sensors that can be used to monitor system leakage.

4.0 Electrical Power Design Features

4.1 The sump level sensors designated as Class 1E in Table 2.9.5-1 are powered from the Class 1E division listed in Table 2.9.5-1.

5.0 Environmental Qualifications

5.1 The sump level sensors listed in Table 2.9.5-1 for EQ harsh environment can initiate an alarm in the MCR following exposure to the environments that exist during and following design basis events.

6.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.9.5-2 lists the NIDVS ITAAC.

Table 2.9.5-1—NIDVS Equipment I&C and Electrical Design

Description	Tag Number (1)	Location	IEEE Class 1E	EQ – Harsh Env.	MCR Display
Level Sensors for Sump 30KTE20BB001	30KTE20CL001	Safeguard Building 1	Division 1	Yes	Yes
Level Sensors for Sump 30KTE20BB002	30KTE20CL003	Safeguard Building 2	Division 2	Yes	Yes
Level Sensors for Sump 30KTE20BB003	30KTE20CL005	Safeguard Building 3	Division 3	Yes	Yes
Level Sensors for Sump 30KTE20BB004	30KTE20CL007	Safeguard Building 4	Division 4	Yes	Yes
Level Sensors for Sump 30KTC30BB001	30KTC30CL001	Fuel Building	Division 1	Yes	Yes
Level Sensors for Sump 30KTC30BB002	30KTC30CL003	Fuel Building	Division 4	Yes	Yes
Level Sensors for Sump 30KTD10BB002	30KTD10CL002	Reactor Building Annulus	Division 4	No	Yes
Level Sensors for Sump 30KTC10BB001	30KTC10CL001	Reactor Building	Division 1	Yes	Yes
	30KTC10CL002	Reactor Building	Division 1	Yes	Yes
Level Sensors for Sump 30KTC10BB002	30KTC10CL005	Reactor Building	Division 4	Yes	Yes
Reactor Building Sump Pump	30KTC10AP001	Reactor Building	N/A	N/A	Start/Stop
Reactor Building Sump Pump	30KTC10AP002	Reactor Building	N/A	N/A	Start/Stop

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

Table 2.9.5-2—Nuclear Island Drain and Vent System ITAAC
(2 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The location of the sump level sensors is as listed in Table 2.9.5-1.	An inspection will be performed to verify the location of the sump level sensors listed in Table 2.9.5-1.	The location of the sump level sensors is as listed in Table 2.9.5-1.
3.1	Displays listed in Table 2.9.5-1 are retrievable in the MCR.	Tests will be performed for MCR displays listed in Table 2.9.5-1.	a. Displays listed in Table 2.9.5-1 are retrievable in the MCR. b. The system can detect 1.0 gpm inflow within one hour.
3.2	The sump level sensor in a Safeguard Building trips the ESWS pump and closes the pump discharge valve in response to a flooding signal.	a. A test will be performed on the SB 1 sump level sensor (30KTE20CL001) listed in Table 2.9.5-1.	a. ESWS pump 1 trips and ESWS pump 1 discharge valve closes on a SB 1 sump level signal.
		b. A test will be performed on the SB 2 sump level sensor (30KTE20CL003) listed in Table 2.9.5-1.	b. ESWS pump 2 trips and ESWS pump 2 discharge valve closes on a SB 2 sump level signal.
		c. A test will be performed on the SB 3 sump level sensor (30KTE20CL005) listed in Table 2.9.5-1.	c. ESWS pump 3 trips and ESWS pump 3 discharge valve closes on a SB 3 sump level signal.
		d. A test will be performed on the SB 4 sump level sensor (30KTE20CL007) listed in Table 2.9.5-1.	d. ESWS pump 4 trips and ESWS pump 4 discharge valve closes on a SB 4 sump level signal.
3.3	The sump has level sensors that can be used to monitor system leakage.	Tests will be performed to verify RB sump level change capability.	Sump level change of 24 gallons is indicated in the MCR.
4.1	The sump level sensors designated as Class 1E in Table 2.9.5-1 are powered from the Class 1E division listed in Table 2.9.5-1.	Tests will be performed for sump level sensors designated as Class 1E in Table 2.9.5-1 by providing a test signal to the aligned Class 1E division.	The test signal provided in the aligned Class 1E division is present at the sump level sensors identified in Table 2.9.5-1.

Table 2.9.5-2—Nuclear Island Drain and Vent System ITAAC
(2 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
5.1	The sump level sensors listed in Table 2.9.5-1 for EQ harsh environment can initiate an alarm in the MCR following exposure to the environments that exist during and following design basis events.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the components listed as EQ-harsh environment in Table 2.9.5-1 to initiate an alarm in the MCR for the environmental conditions that could occur during and following design basis events.	a. Environmental Qualification Data Packages (EQDP) exist and conclude that the components listed as harsh environment in Table 2.9.5-1 can initiate an alarm in the MCR during and following design basis events including the time required to perform the listed function.
		b. Components listed as EQ-harsh environment in Table 2.9.5-1 will be inspected to verify installation in accordance with the construction drawings including the associated wiring, cables, and terminations. Deviations to the construction drawings will be reconciled to the EQDP.	b. Inspection reports exist and conclude that the components listed in Table 2.9.5-1 as harsh environment has been installed per the construction drawings and deviations have been reconciled to the EQDP.

Next File