

2.6.13 Essential Service Water Pump Building Ventilation System

1.0 Description

The essential service water pump building ventilation system (ESWPBVS) controls the temperature and air change rate in the essential service water system (ESWS) pump areas for personnel comfort, personnel safety, and equipment protection during operation of ESWS pumps. The ESWPBVS provides cooling and heating for the ESWS pump area and associated electrical equipment in each of the four ESWS Pump Buildings (ESWPB) to remove equipment heat, and heat generated from other sources. Each building has its own independent ventilation system and is not connected to the other buildings.

The ESWPBVS provides the following safety related functions:

- Removes heat generated by the ESWS pumps and associated electrical equipment.
- Maintains acceptable temperature limits to support operation of ESWS pumps.

The ESWPBVS provides the following non-safety related functions:

- Maintains the room ambient conditions to allow personnel access during normal operation.
- Provides ventilation by recirculation of room air only (without outside air).

2.0 Arrangement

2.1 The functional arrangement of the ESWPBVS is as shown in Figure 2.6.13-1—Essential Service Water Pump Building Ventilation System Functional Arrangement.

2.2 The location of the ESWPBVS equipment is as listed in Table 2.6.13-1—Essential Service Water Pump Building Ventilation System Equipment Mechanical Design.

2.3 Physical separation exists between the four divisions of the ESWPBVS.

3.0 Mechanical Design Features

3.1 Equipment listed in Table 2.6.13-1 as ASME AG-1 is designed, installed, and tested per ASME AG-1.

3.2 Equipment listed in Table 2.6.13-1 performs the function listed in Table 2.6.13-1.

3.3 Equipment identified as Seismic Category I in Table 2.6.13-1 can withstand seismic design basis loads without loss of safety function as listed in Table 2.6.13-1.

4.0 Displays and Controls

4.1 Displays listed in Table 2.6.13-2—Essential Service Water Pump Building Ventilation System Equipment I&C and Electrical Design, are retrievable in the main control room (MCR) and the remote shutdown station (RSS) as listed.

4.2 The ESWPBVS equipment controls are provided in the MCR and RSS as listed in Table 2.6.13-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.13-2 responds to the state requested by a test signal.

5.0 Electrical Power Design Features

5.1 The equipment designated as Class 1E in Table 2.6.13-2 are powered from the Class 1E division as listed in Table 2.6.13-2 in a normal feed condition.

6.0 Equipment and System Performance

6.1 The ESWPBVS provides ventilation of each ESWS Pump Building.

7.0 Inspections, Tests, Analyses and Acceptance Criteria

Table 2.6.13-3 lists the ESWPBVS ITAAC.

Table 2.6.13-1—Essential Service Water Pump Building Ventilation System Equipment Mechanical Design

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Air Cooling Coils	30SAQ01AC001 30SAQ02AC001 30SAQ03AC001 30SAQ04AC001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Moisture Separators	30SAQ01AT001 30SAQ02AT001 30SAQ03AT001 30SAQ04AT001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Electrical Heaters	30SAQ01AH001 30SAQ02AH001 30SAQ03AH001 30SAQ04AH001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	On / Off (based on ambient conditions)	I
Recirculation Fans	30SAQ01AN001 30SAQ02AN001 30SAQ03AN001 30SAQ04AN001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	Run	I
Manual Isolation Dampers	30SAQ01AA001 30SAQ02AA001 30SAQ03AA001 30SAQ04AA001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Manual Isolation Dampers	30SAQ01AA002 30SAQ02AA002 30SAQ03AA002 30SAQ04AA002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I

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

Table 2.6.13-2—Essential Service Water Pump Building Ventilation System Equipment I&C and Electrical Design

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E Source	PACS	MCR / RSS Displays	MCR / RSS Controls
Electrical Heaters	30SAQ01AH001 30SAQ02AH001 30SAQ03AH001 30SAQ04AH001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Recirculation Fans	30SAQ01AN001 30SAQ02AN001 30SAQ03AN001 30SAQ04AN001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run- Stop
Temperature Sensors	30SAQ01CT001 30SAQ02CT001 30SAQ03CT001 30SAQ04CT001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	N/A	Temp / Temp	N/A

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

**Table 2.6.13-3—Essential Service Water Pump Building
Ventilation System ITAAC (3 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the ESWPBVS is as shown on Figure 2.6.13-1.	Inspections of the as-built system will be conducted.	The as-built ESWPBVS conforms to the functional arrangement as shown in Figure 2.6.13-1.
2.2	Equipment shown on Figure 2.6.13-1 is located as listed in Table 2.6.13-1.	An inspection will be performed of the location of the equipment listed in Table 2.6.13-1.	The equipment listed in Table 2.6.13-1 is located as listed in Table 2.6.13-1.
2.3	Physical separation exists between the four divisions of the ESWPBVS.	Inspection will be performed of the ESWPBVS.	Each ESW pump building are as shown on Figure 2.6.13-1.
3.1	Equipment listed in Table 2.6.13-1 as ASME AG-1 is designed, installed, and tested per ASME AG-1.	<ul style="list-style-type: none"> a. Analysis of the equipment identified in Table 2.6.13-1 as ASME AG-1 will be performed per ASME AG-1 design requirements. b. Inspections will be conducted on the equipment identified in Table 2.6.13-1 as ASME AG-1 to verify that the equipment is installed as specified on the construction drawings. c. Testing of the equipment identified in Table 2.6.13-1 as ASME AG-1 will be performed per ASME AG-1 testing requirements. 	<ul style="list-style-type: none"> a. ASME AG-1 reports exist and conclude that the equipment identified in Table 2.6.13-1 as ASME AG-1 meets ASME AG-1 design requirements. b. Equipment listed in Table 2.6.13-1 as ASME AG-1 has been installed as specified on the construction drawings. c. Equipment identified in Table 2.6.13-1 as ASME AG-1 has been tested per ASME AG-1 testing requirements.
3.2	Equipment listed in Table 2.6.13-1 can perform the function listed in Table 2.6.13-1 under system design basis conditions.	Tests will be performed.	Equipment listed in Table 2.6.13-1 performs the function listed in the table under system design basis conditions.

**Table 2.6.13-3—Essential Service Water Pump Building
Ventilation System ITAAC (3 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.6.13-1 can withstand seismic design basis loads without loss of safety function as listed in Table 2.6.13-1.	<p>a. Type tests, analyses or a combination of type tests and analyses will be performed on the equipment designated as Seismic Category I in Table 2.6.13-1 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 2.6.13-1 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 Seismic Category I equipment listed in Table 2.6.13-1 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 2.6.13-1 including anchorage is installed as specified on the construction drawings.</p>
4.1	Displays listed in Table 2.6.13-2 are retrievable in the MCR and the remote shutdown station (RSS) as listed.	Inspections will be performed for the existence or retrievability of the displays in the MCR and the RSS as listed in Table 2.6.13-2.	<p>a. The displays listed in Table 2.6.13-2 as being retrieved in the MCR can be retrieved in the MCR.</p> <p>b. The displays listed in Table 2.6.13-2 as being retrieved in the RSS can be retrieved in the RSS.</p>
4.2	Controls exist in the MCR and the RSS as listed in Table 2.6.13-2.	Test will be performed for the existence of control signals from the MCR and the RSS to the equipment listed in Table 2.6.13-2.	<p>a. The controls listed in Table 2.6.13-2 as being in the MCR exist in the MCR.</p> <p>b. The controls listed in Table 2.6.13-2 as being in the RSS exist in the RSS.</p>
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.13-2 responds to the state requested by a test signal.	A test will be performed using test signals.	Equipment listed as being controlled by a PACS module in Table 2.6.13-2 responds to the state requested by the test signal.

**Table 2.6.13-3—Essential Service Water Pump Building
Ventilation System ITAAC (3 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
5.1	The components designated as Class 1E in Table 2.6.13-2 are powered from the Class 1E division as listed in Table 2.6.13-2 in a normal feed condition.	Testing will be performed for the components designated as Class 1E in Table 2.6.13-2 by providing a test signal in each normally aligned division.	The test signal provided in the normally aligned division is present at the respective Class 1E components identified in Table 2.6.13-2.
6.1	The ESWPBVS provides ventilation of each ESWPB.	Tests will be performed to verify capability of the system to maintain the flow rate for each fan in each division in each ESWPB. Test is performed separately for each building.	A separate test for each building verifies the following flow rate for each fan in each division: Supply fan is greater than or equal to 115,000 scfm.