

**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 is designed, inspected 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 a design basis seismic load 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.

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

4.3 Actuators listed as being controlled by a priority actuator control system (PACS) module in Table 2.6.13-2 are controlled by a PACS module.

## **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 by maintaining an adequate room air recirculation flow rate.

## **7.0 Inspections, Tests, Analyses and Acceptance Criteria**

The inspection, tests, analyses, and acceptance criteria (ITAAC) for the ESWPBVS are specified in Table 2.6.13-3—Essential Service Water Pump Building Ventilation System ITAAC.

**Table 2.6.13-1—Essential Service Water Pump Building Ventilation System Equipment Mechanical Design (2 Sheets)**

<b>Equipment Description</b>	<b>Equipment Tag Number <sup>(1)</sup></b>	<b>Equipment Location</b>	<b>ASME AG-1 Code</b>	<b>Function</b>	<b>Seismic Category</b>
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 30SAQ03AH01 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	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3	Yes	N/A	I

**Table 2.6.13-1—Essential Service Water Pump Building Ventilation System Equipment Mechanical Design (2 Sheets)**

<b>Equipment Description</b>	<b>Equipment Tag Number <sup>(1)</sup></b>	<b>Equipment Location</b>	<b>ASME AG-1 Code</b>	<b>Function</b>	<b>Seismic Category</b>
	30SAQ04AA001	ESW Pump Building 4			
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**

<b>Equipment Description</b>	<b>Equipment Tag Number <sup>(1)</sup></b>	<b>Equipment Location</b>	<b>IEEE Class 1E Source</b>	<b>PACS</b>	<b>MCR / RSS Displays</b>	<b>MCR / RSS Controls</b>
Electrical Heaters	30SAQ01AH001 30SAQ02AH001 30SAQ03AH01 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 30SAQ03AN01 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 30SAQ03CT01 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 (2 Sheets)**

<b>Reference Section Number</b>	<b>Commitment Wording</b>	<b>Inspection, Analysis or Test</b>	<b>Acceptance Criteria</b>
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 ESWS Pump Buildings.	Inspection will be performed of the ESWPBVS.	Each building has its own independent system which is not connected to other divisions.
3.1	The ESWPBVS equipment listed as ASME AG-1 Code in Table 2.6.13-1 is designed, inspected, and tested in accordance with ASME AG-1 Code.	Analyses will be performed and inspections will be conducted of the as-built components listed in Table 2.6.13-1.	The ESWPBVS equipment listed in Table 2.6.13-1 is designed, inspected, and tested in accordance with ASME AG-1 Code.
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 and analyses or a combination of tests and analyses will be performed.	The as-installed equipment changes position as listed in Table 2.6.13-1 under system design basis conditions.
3.3	Equipment identified as Seismic Category I in Table 2.6.13-1 can withstand a design basis seismic load without loss of safety function as listed in Table 2.6.13-1.	a) Inspections will be performed of the equipment identified as Seismic Category I in Table 2.6.13-1. b) Type tests, tests, analyses or a combination of tests and analyses will be performed on the equipment designated as Seismic Category I in Table 2.6.13-1.	a) The equipment designated as Seismic Category I in Table 2.6.13-1 is installed as designed. b) The equipment designated as Seismic Category I in Table 2.6.13-1 can withstand a design basis seismic load without loss of safety function.
4.1	Displays listed in Table 2.6.13-2 are retrievable in	Inspections will be performed for the existence	a) The displays listed in Table 2.6.13-2 as being

**Table 2.6.13-3—Essential Service Water Pump Building  
Ventilation System ITAAC (2 Sheets)**

Reference Section Number	Commitment Wording	Inspection, Analysis or Test	Acceptance Criteria
	the MCR and the remote shutdown station (RSS) as listed.	or retrieve-ability of the displays in the MCR and the RSS as listed in Table 2.6.13-2.	retrieved in the MCR can be retrieved in the MCR. b) The displays listed in Table 2.6.13-2 as being retrieved in the RSS can be retrieved in the RSS.
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.	a) The controls listed in Table 2.6.13-2 as being in the MCR exist in the MCR. b) The controls listed in Table 2.6.13-2 as being in the RSS exist in the RSS.
4.3	Actuators listed as being controlled by a Priority Actuator Control System (PACS) module in Table 2.6.13-2 are controlled by a PACS module.	An operational test will be performed using test signals. An inspection will be performed on the actuation of the actuator.	The actuators listed as being controlled by a PACS module in Table 2.6.13-2 actuate to the state requested by the test signal.
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.	a) 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.	a) The test signal provided in the normally aligned division is present at the respective Class 1E component identified in Table 2.6.13-2.
6.1	The ESWPBVS provides ventilation of each ESWPB by maintaining an adequate room air recirculation flow rate.	Tests will be performed to verify capability of the system to maintain adequate flow rate in each ESWPB. Test is performed separately for each building.	A separate test for each building verifies that adequate flow rate is maintained for ventilation of the ESWPBs.