

2.6.9 Emergency Power Generating Building Ventilation System

1.0 Description

The emergency power generating building ventilation system (EPGBVS) controls the temperature, humidity and air change rate in the Emergency Power Generating Buildings (EPGB) for personnel comfort, personnel safety, and equipment protection during operation of the emergency diesel generators (EDG). The EPGBVS provides ventilation of the diesel hall, electrical room, and main tank room; and cooling of the electrical room for each of the four divisions of the EPGBs to remove equipment heat, and heat generated from other sources. The EPGBVS also provides heat to maintain a minimum temperature in the buildings.

Each division of the EPGBs has its own independent heating, ventilation and air conditioning system which is not connected to other divisions. Two divisions are located in each of the two EPGBs. During normal plant operation, the EDGs do not operate, however the EPGBVS maintains an acceptable ambient temperature for the startup of EDGs and for personnel comfort.

The EPGBVS provides the following safety related functions:

- Removes heat generated by the EDGs during operation of the EDGs to maintain acceptable operating conditions in the diesel hall.
- Maintains acceptable ambient conditions in the electrical room and main tank room.
- Maintains environmental conditions for startup of the EDGs.

The EPGBVS provides the following non-safety related functions:

- Maintains the room ambient conditions to allow personnel access during normal operation.
- Provides sufficient ventilation to maintain required air renewal rates.

2.0 Arrangement

2.1 The functional arrangement of the EPGBVS is as shown in the following figures:

- Figure 2.6.9-1—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 1.
- Figure 2.6.9-2—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 2.
- Figure 2.6.9-3—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 3.
- Figure 2.6.9-4—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 4.

2.2 The location of the EPGBVS equipment is as listed in Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design.

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

3.0 Mechanical Design Features

3.1 Equipment listed in Table 2.6.9-1 is designed, inspected and tested per ASME AG-1.

3.2 Equipment listed in Table 2.6.9-1 performs the function listed in Table 2.6.9-1.

3.3 Equipment identified as Seismic Category I in Table 2.6.9-1 can withstand a design basis seismic load without loss of safety function as listed in Table 2.6.9-1.

4.0 Displays and Controls

4.1 Displays listed in Table 2.6.9-2—Emergency Power Generating 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 EPGBVS equipment controls are provided in the MCR and RSS as listed in Table 2.6.9-2.

4.3 Actuators listed as being controlled by a priority actuator control system (PACS) module in Table 2.6.9-2 are controlled by a PACS module.

5.0 Electrical Power Design Features

5.1 The equipment designated as Class 1E in Table 2.6.9-2 are powered from the Class 1E division as listed in Table 2.6.9-2 in a normal feed condition.

5.2 Motor operated dampers listed in Table 2.6.9-2 fail to the position as shown in Table 2.6.9-2 on loss of power.

6.0 Equipment and System Performance

6.1 The EPGBVS provides ventilation of each division of EPGBs by maintaining an adequate air flow rate.

7.0 Inspections, Tests, Analyses and Acceptance Criteria

The inspection, tests, analyses, and acceptance criteria (ITAAC) for the EPGBVS are specified in Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC.

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
<u>Fresh Air Supply</u>					
Back draft dampers	30SAD11AA001 30SAD21AA001 30SAD31AA001 30SAD41AA001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Back draft dampers	30SAD11AA002 30SAD21AA002 30SAD31AA002 30SAD41AA002	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Prefilters	30SAD11AT001 30SAD21AT001 30SAD31AT001 30SAD41AT001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Prefilters	30SAD11AT002 30SAD21AT002 30SAD31AT002 30SAD41AT002	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Supply air fans	30SAD11AN001 30SAD21AN001 30SAD31AN001 30SAD41AN001	Division 1 Division 2 Division 3 Division 4	Yes	Run	I
Supply air fans	30SAD11AN002 30SAD21AN002	Division 1 Division 2	Yes	Run	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
	30SAD31AN002 30SAD41AN002	Division 3 Division 4			
<u>Diesel Hall Air Supply and Exhaust</u>					
Manual dampers	30SAD12AA001 30SAD22AA001 30SAD32AA001 30SAD42AA001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Manual dampers	30SAD12AA002 30SAD22AA002 30SAD32AA002 30SAD42AA002	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Manual dampers	30SAD12AA003 30SAD22AA003 30SAD32AA003 30SAD42AA003	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Manual dampers	30SAD12AA004 30SAD22AA004 30SAD32AA004 30SAD42AA004	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Manual dampers	30SAD12AA005 30SAD22AA005 30SAD32AA005 30SAD42AA005	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Exhaust fans	30SAD15AN001 30SAD25AN001 30SAD35AN001 30SAD45AN001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Exhaust fans	30SAD15AN002 30SAD25AN002 30SAD35AN002 30SAD45AN002	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Back draft dampers	30SAD15AA001 30SAD25AA001 30SAD35AA001 30SAD45AA001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Back draft dampers	30SAD15AA002 30SAD25AA002 30SAD35AA002 30SAD45AA002	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
<u>Electrical Room Air Supply and Recirculation</u>					
Motor operated dampers	30SAD13AA001 30SAD23AA001 30SAD33AA001 30SAD43AA001	Division 1 Division 2 Division 3 Division 4	Yes	Open	I
Manual dampers	30SAD13AA002 30SAD23AA002 30SAD33AA002	Division 1 Division 2 Division 3	Yes	N/A	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
	30SAD43AA002	Division 4			
Pre-filters	30SAD13AT001 30SAD23AT001 30SAD33AT001 30SAD43AT001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
HEPA filters	30SAD13AT002 30SAD23AT002 30SAD33AT002 30SAD43AT002	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Cooling Coils	30SAD13AC001 30SAD23AC001 30SAD33AC001 30SAD43AC001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Moisture separators	30SAD13AT003 30SAD23AT003 30SAD33AT003 30SAD43AT003	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Electric Heaters	30SAD13AH001 30SAD23AH001 30SAD33AH001 30SAD43AH001	Division 1 Division 2 Division 3 Division 4	Yes	On / Off	I
Supply air fans	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	Division 1 Division 2 Division 3 Division 4	Yes	Run	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Humidifiers	30SAD13AH002 30SAD23AH002 30SAD33AH002 30SAD43AH002	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Back draft dampers	30SAD13AA003 30SAD23AA003 30SAD33AA003 30SAD43AA003	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Back draft dampers	30SAD13AA006 30SAD23AA006 30SAD33AA006 30SAD43AA006	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Main Tank Room Air Supply and Exhaust					
Back draft dampers	30SAD16AA001 30SAD26AA001 30SAD36AA001 30SAD46AA001	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Manual dampers	30SAD16AA003 30SAD26AA003 30SAD36AA003 30SAD46AA003	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Manual dampers	30SAD16AA004 30SAD26AA004 30SAD36AA004	Division 1 Division 2 Division 3	Yes	N/A	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
	30SAD46AA004	Division 4			
Exhaust fans	30SAD16AN001 30SAD26AN001 30SAD36AN001 30SAD46AN001	Division 1 Division 2 Division 3 Division 4	Yes	Run	I
Back draft damper	30SAD16AA005 30SAD26AA005 30SAD36AA005 30SAD46AA005	Division 1 Division 2 Division 3 Division 4	Yes	N/A	I
Fan Heaters	30SAD14AH001 30SAD14AH002 30SAD14AH003 30SAD14AH004	Division 1	Yes	On / Off	I
Fan Heaters	30SAD24AH001 30SAD24AH002 30SAD24AH003 30SAD24AH004	Division 2	Yes	On / Off	I
Fan Heaters	30SAD34AH001 30SAD34AH002 30SAD34AH003 30SAD34AH004	Division 3	Yes	On / Off	I
Fan Heaters	30SAD44AH001 30SAD44AH002 30SAD44AH003 30SAD44AH004	Division 3	Yes	On / Off	I

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

Table 2.6.9-2—Emergency Power Generating Building Ventilation System Equipment I&C and Electrical Design (3 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E Source	Failure Position	PACS	MCR / RSS Displays	MCR / RSS Controls
Supply air fans	30SAD11AN001 30SAD21AN001 30SAD31AN001 30SAD41AN001	Division 1 Division 2 Division 3 Division 4	Division 1 Division 2 Division 3 Division 4	N/A	Yes	On-Off / On-Off	Run-Stop / Run- Stop
Supply air fans	30SAD11AN002 30SAD21AN002 30SAD31AN002 30SAD41AN002	Division 1 Division 2 Division 3 Division 4	Division 1 Division 2 Division 3 Division 4	N/A	Yes	On-Off / On-Off	Run-Stop / Run- Stop
Exhaust fans	30SAD15AN001 30SAD25AN001 30SAD35AN001 30SAD45AN001	Division 1 Division 2 Division 3 Division 4	Division 1 Division 2 Division 3 Division 4	N/A	Yes	On-Off / On-Off	Run-Stop / Run- Stop
Exhaust fans	30SAD15AN002 30SAD25AN002 30SAD35AN002 30SAD45AN002	Division 1 Division 2 Division 3 Division 4	Division 1 Division 2 Division 3 Division 4	N/A	Yes	On-Off / On-Off	Run-Stop / Run- Stop
Motor operated dampers	30SAD13AA001 30SAD23AA001 30SAD33AA001 30SAD43AA001	Division 1 Division 2 Division 3 Division 4	Division 1 Division 2 Division 3 Division 4	Close	Yes	Position / Position	Open-Close / Open-Close
Electric Heaters	30SAD13AH001 30SAD23AH001	Division 1 Division 2	Division 1 Division 2	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop

Table 2.6.9-2—Emergency Power Generating Building Ventilation System Equipment I&C and Electrical Design (3 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E Source	Failure Position	PACS	MCR / RSS Displays	MCR / RSS Controls
	30SAD33AH001 30SAD43AH001	Division 3 Division 4	Division 3 Division 4				
Supply air fans	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	Division 1 Division 2 Division 3 Division 4	Division 1 Division 2 Division 3 Division 4	N/A	Yes	On-Off / On-Off	Run-Stop / Run- Stop
Exhaust fans	30SAD16AN001 30SAD26AN001 30SAD36AN001 30SAD46AN001	Division 1 Division 2 Division 3 Division 4	Division 1 Division 2 Division 3 Division 4	N/A	Yes	On-Off / On-Off	Run-Stop / Run- Stop
Fan Heaters	30SAD14AH001 30SAD14AH002 30SAD14AH003 30SAD14AH004	Division 1	Division 1	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD24AH001 30SAD24AH002 30SAD24AH003 30SAD24AH004	Division 2	Division 2	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD34AH001 30SAD34AH002 30SAD34AH003 30SAD34AH004	Division 3	Division 3	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD44AH001 30SAD44AH002	Division 3	Division 3	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop

Table 2.6.9-2—Emergency Power Generating Building Ventilation System Equipment I&C and Electrical Design (3 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E Source	Failure Position	PACS	MCR / RSS Displays	MCR / RSS Controls
	30SAD44AH003 30SAD44AH004						

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

Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC (3 Sheets)

Reference Section Number	Commitment Wording	Inspection, Analysis or Test	Acceptance Criteria
2.1	The functional arrangement of the EPGBVS is as shown on Figures 2.6.9-1, 2.6.9-2, 2.6.9-3, and 2.6.9-4.	Inspections of the as-built system will be conducted.	The as-built EPGBVS conforms to the functional arrangement as shown in Figures 2.6.9-1, 2.6.9-2, 2.6.9-3, and 2.6.9-4.
2.2	Equipment shown on Figures 2.6.9-1, 2.6.9-1, 2.6.9-2, 2.6.9-3 and 2.6.9-4 is located as listed in Table 2.6.9-1.	An inspection will be performed of the location of the equipment listed in Table 2.6.9-1.	The equipment listed in Table 2.6.9-1 is located as listed in Table 2.6.9-1.
2.3	Physical separation exists between the four divisions of the EPGBVS.	Inspection will be performed of the EPGBVS.	Each division has its own independent system which is not connected to other divisions. Two divisions are located in each of the two EPGBs.
3.1	The EPGBVS equipment listed as ASME AG-1 Code in Table 2.6.9-1 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 2.6.9-1.	The EPGBVS equipment listed in Table 2.6.9-1 is designed, inspected, and tested in accordance with ASME AG-1 Code.
3.2	Equipment listed in Table 2.6.9-1 can perform the function listed in Table 2.6.9-1 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 2.6.9-1 under system design basis conditions.
3.3	Equipment identified as Seismic Category I in Table 2.6.9-1 can withstand a design basis seismic load without loss of safety function as listed in Table 2.6.9-1.	a) Inspections will be performed of the equipment identified as Seismic Category I in Table 2.6.9-1. b) Type tests, tests, analyses or a combination of tests and analyses will be performed on the equipment designated as Seismic Category I in	a) The equipment designated as Seismic Category I in Table 2.6.9-1 is installed as designed. b) The equipment designated as Seismic Category I in Table 2.6.9-1 can withstand a design basis seismic load without loss of safety function.

Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC (3 Sheets)

Reference Section Number	Commitment Wording	Inspection, Analysis or Test	Acceptance Criteria
		Table 2.6.9-1.	
4.1	Displays listed in Table 2.6.9-2 are retrievable in the MCR and the remote shutdown station (RSS) as listed.	Inspections will be performed for the existence or retrieve-ability of the displays in the MCR and the RSS as listed in Table 2.6.9-2.	a) The displays listed in Table 2.6.9-2 as being retrieved in the MCR can be retrieved in the MCR. b) The displays listed in Table 2.6.9-2 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 2.6.9-2.	Test will be performed for the existence of control signals from the MCR and the RSS to the equipment listed in Table 2.6.9-2.	a) The controls listed in Table 2.6.9-2 as being in the MCR exist in the MCR. b) The controls listed in Table 2.6.9-2 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 2.6.9-2 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 2.6.9-2 actuate to the state requested by the test signal.
5.1	The components designated as Class 1E in Table 2.6.9-2 are powered from the Class 1E division as listed in Table 2.6.9-2 in a normal feed condition.	a) Testing will be performed for the components designated as Class 1E in Table 2.6.9-2 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 2.6.9-2.
5.2	Motor operated dampers listed in Table 2.6.9-2 fail to the position as shown in Table 2.6.9-2 on loss of power.	Testing will be performed for the motor operated dampers listed in Table 2.6.9-2 to verify the position of dampers on loss of power.	Following loss of power, the motor operated dampers listed in Table 2.6.9-2 fail to the position as shown in Table 2.6.9-2.
6.1	The EPGBVS provides ventilation of each division of EPGBs by maintaining an adequate air flow rate.	Tests will be performed to verify capability of the system to maintain adequate air flow rate in the EPGBs. Test is	A separate test for each division verifies that adequate flow rate is maintained for ventilation of the EPGBs.

**Table 2.6.9-3—Emergency Power Generating Building
Ventilation System ITAAC (3 Sheets)**

Reference Section Number	Commitment Wording	Inspection, Analysis or Test	Acceptance Criteria
		performed separately for each division.	