

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 as ASME AG-1 is designed, installed, 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 seismic design basis loads 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 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.9-2 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 2.6.9-2 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.

7.0 Inspections, Tests, Analyses and Acceptance Criteria

Table 2.6.9-3 lists the EPGBVS ITAAC.

**Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment
Mechanical Design (6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Fresh Air Supply					
Back draft dampers	30SAD11AA001 30SAD21AA001 30SAD31AA001 30SAD41AA001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Back draft dampers	30SAD11AA002 30SAD21AA002 30SAD31AA002 30SAD41AA002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Prefilters	30SAD11AT001 30SAD21AT001 30SAD31AT001 30SAD41AT001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Prefilters	30SAD11AT002 30SAD21AT002 30SAD31AT002 30SAD41AT002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Supply air fans	30SAD11AN001 30SAD21AN001 30SAD31AN001 30SAD41AN001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	Run	I
Supply air fans	30SAD11AN002 30SAD21AN002 30SAD31AN002 30SAD41AN002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	Run	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (6 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Diesel Hall Air Supply and Exhaust					
Manual dampers	30SAD12AA001 30SAD22AA001 30SAD32AA001 30SAD42AA001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Manual dampers	30SAD12AA002 30SAD22AA002 30SAD32AA002 30SAD42AA002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Manual dampers	30SAD12AA003 30SAD22AA003 30SAD32AA003 30SAD42AA003	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Manual dampers	30SAD12AA004 30SAD22AA004 30SAD32AA004 30SAD42AA004	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Manual dampers	30SAD12AA005 30SAD22AA005 30SAD32AA005 30SAD42AA005	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Exhaust fans	30SAD15AN001 30SAD25AN001 30SAD35AN001 30SAD45AN001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (6 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Exhaust fans	30SAD15AN002 30SAD25AN002 30SAD35AN002 30SAD45AN002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Back draft dampers	30SAD15AA001 30SAD25AA001 30SAD35AA001 30SAD45AA001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Back draft dampers	30SAD15AA002 30SAD25AA002 30SAD35AA002 30SAD45AA002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Electrical Room Air Supply and Recirculation					
Motor operated dampers	30SAD13AA001 30SAD23AA001 30SAD33AA001 30SAD43AA001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	Open	I
Manual dampers	30SAD13AA002 30SAD23AA002 30SAD33AA002 30SAD43AA002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Pre-filters	30SAD13AT001 30SAD23AT001 30SAD33AT001 30SAD43AT001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I

**Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment
Mechanical Design (6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
HEPA filters	30SAD13AT002 30SAD23AT002 30SAD33AT002 30SAD43AT002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Cooling Coils	30SAD13AC001 30SAD23AC001 30SAD33AC001 30SAD43AC001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Moisture separators	30SAD13AT003 30SAD23AT003 30SAD33AT003 30SAD43AT003	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Electric Heaters	30SAD13AH001 30SAD23AH001 30SAD33AH001 30SAD43AH001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	On / Off	I
Supply air fans	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	Run	I
Humidifiers	30SAD13AH002 30SAD23AH002 30SAD33AH002 30SAD43AH002	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (6 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Back draft dampers	30SAD13AA003 30SAD23AA003 30SAD33AA003 30SAD43AA003	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Back draft dampers	30SAD13AA006 30SAD23AA006 30SAD33AA006 30SAD43AA006	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Main Tank Room Air Supply and Exhaust					
Back draft dampers	30SAD16AA001 30SAD26AA001 30SAD36AA001 30SAD46AA001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Manual dampers	30SAD16AA003 30SAD26AA003 30SAD36AA003 30SAD46AA003	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Manual dampers	30SAD16AA004 30SAD26AA004 30SAD36AA004 30SAD46AA004	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Exhaust fans	30SAD16AN001 30SAD26AN001 30SAD36AN001 30SAD46AN001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	Run	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (6 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME AG-1 Code	Function	Seismic Category
Back draft damper	30SAD16AA005 30SAD26AA005 30SAD36AA005 30SAD46AA005	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Yes	N/A	I
Fan Heaters	30SAD14AH001 30SAD14AH002 30SAD14AH003 30SAD14AH004	EPGB 1	Yes	On / Off	I
Fan Heaters	30SAD24AH001 30SAD24AH002 30SAD24AH003 30SAD24AH004	EPGB 2	Yes	On / Off	I
Fan Heaters	30SAD34AH001 30SAD34AH002 30SAD34AH003 30SAD34AH004	EPGB 3	Yes	On / Off	I
Fan Heaters	30SAD44AH001 30SAD44AH002 30SAD44AH003 30SAD44AH004	EPGB 4	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 (2 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	EPGB 1 EPGB 2 EPGB 3 EPGB 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	EPGB 1 EPGB 2 EPGB 3 EPGB 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	EPGB 1 EPGB 2 EPGB 3 EPGB 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	EPGB 1 EPGB 2 EPGB 3 EPGB 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	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Division 1 Division 2 Division 3 Division 4	Close	Yes	Position / Position	Open-Close / Open-Close
Electric Heaters	30SAD13AH001 30SAD23AH001 30SAD33AH001 30SAD43AH001	EPGB 1 EPGB 2 EPGB 3 EPGB 4	Division 1 Division 2 Division 3 Division 4	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 (2 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	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	EPGB 1 EPGB 2 EPGB 3 EPGB 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	EPGB 1 EPGB 2 EPGB 3 EPGB 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	EPGB 1	Division 1	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD24AH001 30SAD24AH002 30SAD24AH003 30SAD24AH004	EPGB 2	Division 2	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD34AH001 30SAD34AH002 30SAD34AH003 30SAD34AH004	EPGB 3	Division 3	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD44AH001 30SAD44AH002 30SAD44AH003 30SAD44AH004	EPGB 4	Division 4	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop

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)

Commitment Wording		Inspections, Tests, Analyses	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.	<ul style="list-style-type: none"> a. Each mechanical division of the EPGBs are as shown on Figures 2.6.9-1 through 2.6.9-4. b. Two mechanical divisions are located in each of the two EPGBs.
3.1	Equipment listed in Table 2.6.9-1 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 2.6.9-1 as ASME AG-1 will be performed per ASME AG-1 design requirements. b. Inspections will be conducted on the equipment identified in Table 2.6.9-1 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 2.6.9-1 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 2.6.9-1 as ASME AG-1 meets ASME AG-1 design requirements. b. Equipment identified in Table 2.6.9-1 as ASME AG-1 has been installed as specified on the construction drawings. c. Equipment identified in Table 2.6.9-1 as ASME AG-1 has been tested per ASME AG-1 testing requirements.
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 will be performed.	Equipment listed in Table 2.6.9-1 performs the function listed in the table under system design basis conditions.

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

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.6.9-1 can withstand seismic design basis loads without loss of safety function as listed in Table 2.6.9-1.	<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 2.6.9-1 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 2.6.9-1 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 2.6.9-1 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 2.6.9-1 including anchorage is installed as specified on the construction drawings.</p>
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 retrievability of the displays in the MCR and the RSS as listed in Table 2.6.9-2.	<p>a. The displays listed in Table 2.6.9-2 as being retrieved in the MCR can be retrieved in the MCR.</p> <p>b. The displays listed in Table 2.6.9-2 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 2.6.9-2.	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.	<p>a. The controls listed in Table 2.6.9-2 as being in the MCR exist in the MCR.</p> <p>b. The controls listed in Table 2.6.9-2 as being in the RSS exist in the RSS.</p>
4.3	Equipment listed as being controlled by a PACS module in Table 2.6.9-2 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 2.6.9-2 responds to the state requested by the test signal.

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

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
5.1	The components designated as Class 1E in Table 2.6.9-2 are powered from the Class 1E division as listed in Table 2.6.9-2 in a normal feed condition.	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.	The test signal provided in the normally aligned division is present at the respective Class 1E components 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.	Tests will be performed to verify capability of the system to maintain the flow rate for each fan in each division in the EPGBs. Test is performed separately for each division.	A separate test for each division verifies the following flow rates for each fan in each division: <ul style="list-style-type: none"> a. Diesel hall supply fan is greater than or equal to 85,000 scfm. b. Diesel hall exhaust fan is greater than or equal to 85,000 scfm. c. Fuel tank room exhaust fan is greater than or equal to 3,200 scfm. d. EDG control/electrical room supply fan is less than 6,000 scfm and greater than 1,814 scfm.