

2.5.4 Emergency Diesel Generator

1.0 Description

The emergency diesel generators (EDG) provide a standby source of Class 1E power to safety-related and non-safety-related loads during conditions that result in a loss of preferred power to emergency power supply system (EPSS) buses.

2.0 Arrangement

2.1 The functional arrangement of the EDG fuel oil storage and transfer system is as shown on Figure 2.5.4-1—Emergency Diesel Generator Fuel Oil Storage and Transfer System Functional Arrangement.

2.2 EDGs and respective support systems are located as listed in Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design.

2.3 Deleted.

2.4 The functional arrangement of the EDG lubricating oil system is as shown on Figure 2.5.4-2—Emergency Diesel Generator Lubricating Oil System Functional Arrangement.

2.5 The functional arrangement of the EDG air intake and exhaust system is as shown on Figure 2.5.4-3—Emergency Diesel Generator Air Intake and Exhaust System Functional Arrangement.

2.6 The functional arrangement of the EDG cooling water system is as shown on Figure 2.5.4-4—Emergency Diesel Generator Cooling Water System Functional Arrangement.

2.7 The functional arrangement of the EDG starting air system is as shown on Figure 2.5.4-5—Emergency Diesel Generator Starting Air System Functional Arrangement.

3.0 Mechanical Design Features, Electrical and Seismic Classifications

3.1 Deleted.

3.2 Deleted.

3.3 Deleted.

3.4 Deleted.

3.5 Deleted.

3.6 Deleted.

3.7 Components identified as Seismic Category I in Table 2.5.4-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.5.4-1.

3.8 Deleted.

- 3.9 Each EDG has a fuel oil storage tank.
- 3.10 Each EDG has a fuel oil day tank.
- 3.11 Each fuel oil transfer pump capacity is greater than EDG fuel oil consumption at the continuous rating.
- 3.12 Each EDG starting air system is capable of providing air to start the respective EDG without being recharged.
- 3.13 Check valves listed in Table 2.5.4-1 will function as listed in Table 2.5.4-1.
- 3.14 Each EDG lubricating oil system provides lubrication to the engine and turbocharger wearing parts during engine operation.
- 3.15 Each EDG exhaust path has a bypass exhaust path.
- 3.16 EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 is designed in accordance with ASME Code Section III requirements.
- 3.17 EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 is installed in accordance with an ASME Code Section III Design Report.
- 3.18 Pressure boundary welds in EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 are in accordance with ASME Code Section III.
- 3.19 EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 retains pressure boundary integrity at design pressure.
- 3.20 EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 is installed and inspected in accordance with ASME Code Section III requirements.
- 3.21 Components listed in Table 2.5.4-1 as ASME Code Section III are designed in accordance with ASME Code Section III requirements.
- 3.22 Components listed in Table 2.5.4-1 as ASME Code Section III are fabricated in accordance with ASME Code Section III requirements.
- 3.23 Pressure boundary welds on components listed in Table 2.5.4-1 as ASME Code Section III are in accordance with ASME Code Section III requirements.
- 3.24 Components listed in Table 2.5.4-1 as ASME Code Section III retain pressure boundary integrity at design pressure.

4.0 I&C Design Features, Alarms, Displays and Controls

- 4.1 Displays listed in Table 2.5.4-2 and Table 2.5.4-3 are retrievable in the main control room (MCR) and the remote shutdown station (RSS) as listed in Table 2.5.4-2 and Table 2.5.4-3.
- 4.2 EDG equipment controls are provided in the MCR and RSS as listed in Table 2.5.4-2 and Table 2.5.4-3.
- 4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.5.4-2 responds to the state requested by a test signal.

5.0 Electrical Considerations

- 5.1 The EDG control power is provided by the EUPS system from the respective division.
- 5.2 The components identified as Class 1E in Table 2.5.4-2 are powered from the Class 1E division listed in Table 2.5.4-2.
- 5.3 Each EDG output rating is greater than the analyzed loads assigned in the respective emergency power supply system (EPSS) division and loads capable of being connected to the EPSS division through the alternate feed.
- 5.4 Valves listed in Table 2.5.4-2 fail to the position as shown in Table 2.5.4-2 on loss of power.

6.0 Equipment and System Performance

- 6.1 Each EDG is started by a protection system loss of offsite power (LOOP) signal from the respective EPSS division medium voltage bus.
- 6.2 Each EDG is started by a protection system safety injection system (SIS) actuation signal.
- 6.3 Each EDG will start and connect to the respective EPSS division medium voltage bus in an undervoltage condition concurrent with a SIS actuation signal.
- 6.4 The EDG lubricating oil system heat exchangers listed in Table 2.5.4-1 have the capacity to transfer the design heat load to the essential service water system.
- 6.5 Class 1E valves listed in Table 2.5.4-2 can perform the function listed in Table 2.5.4-1 under system operating conditions.
- 6.6 The EDG cooling water system heat exchangers as listed in Table 2.5.4-1 have the capacity to transfer the design heat load to the essential service water.
- 6.7 Each EDG is capable of starting from standby conditions and achieving required voltage and frequency.

7.0 Inspection, Tests, Analyses and Acceptance Criteria

Table 2.5.4-4 lists the EDG ITAAC.

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Emergency Diesel Generator	30XJA10 30XJA20 30XJA30 30XJA40	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Supply Emergency Power	I
Fuel Oil Storage Tank	30XJN10BB001 30XJN20BB001 30XJN30BB001 30XJN40BB001	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Storage Volume	I
Fuel Oil Transfer Pump	30XJN10AP001A 30XJN20AP001A 30XJN30AP001A 30XJN40AP001A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Run	I
Fuel Oil Day Tank	30XJN10BB002 30XJN20BB002 30XJN30BB002 30XJN40BB002	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Storage Volume	I
Fuel Oil Strainer	30XJN10AT260 30XJN20AT260 30XJN30AT260 30XJN40AT260	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Check Valve	30XJN10AA201 30XJN20AA201 30XJN30AA201 30XJN40AA201	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, Close	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Check Valve	30XJN10AA226 30XJN20AA226 30XJN30AA226 30XJN40AA226	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, Close	I
Check Valve	30XJN10AA227 30XJN20AA227 30XJN30AA227 30XJN40AA227	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Open, Close	I
Check Valve	30XJN10AA228 30XJN20AA228 30XJN30AA228 30XJN40AA228	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Open, Close	I
Fuel Oil Filter	30XJN10AT267 30XJN20AT267 30XJN30AT267 30XJN40AT267	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Fuel Oil Strainer	30XJN10AT271 30XJN20AT271 30XJN30AT271 30XJN40AT271	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Fuel Oil Pump	30XJN10AP110 30XJN20AP110 30XJN30AP110 30XJN40AP110	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Run	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Fuel Oil Pump	30XJN10AP120 30XJN20AP120 30XJN30AP120 30XJN40AP120	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Run	I
Fuel Oil Filter	30XJN10AT280 30XJN20AT280 30XJN30AT280 30XJN40AT280	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Filter	I
Lube Oil System Valve	30XJV10AA170 30XJV20AA170 30XJV30AA170 30XJV40AA170	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Lube Oil System Valve	30XJV10AA171 30XJV20AA171 30XJV30AA171 30XJV40AA171	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Lube Oil System Valve	30XJV10AA154 30XJV20AA154 30XJV30AA154 30XJV40AA154	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Lube Oil Temperature Control Valve	30XJV10AA111 30XJV20AA111 30XJV30AA111 30XJV40AA111	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Lube Oil Strainer Supply Selector Valve	30XJV10AA265 30XJV20AA265 30XJV30AA265 30XJV40AA265	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Lube Oil Pump Discharge Filter Selection Valve	30XJV10AA260 30XJV20AA260 30XJV30AA260 30XJV40AA260	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Lube Oil System Heat Exchanger	30XJV10AC001 30XJV20AC001 30XJV30AC001 30XJV40AC001	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Heat transfer device	I
Check Valve	30XJV10AA207 30XJV20AA207 30XJV30AA207 30XJV40AA207	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Check Valve	30XJV10AA206 30XJV20AA206 30XJV30AA206 30XJV40AA206	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Lube Oil Filter	30XJV10AT110A 30XJV20AT110A 30XJV30AT110A 30XJV40AT110A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Lube Oil Filter	30XJV10AT110B 30XJV20AT110B 30XJV30AT110B 30XJV40AT110B	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Lube Oil Strainer	30XJV10AT115A 30XJV20AT115A 30XJV30AT115A 30XJV40AT115A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Lube Oil Strainer	30XJV10AT115B 30XJV20AT115B 30XJV30AT115B 30XJV40AT115B	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Lube Oil Pump	30XJV10AP110 30XJV20AP110 30XJV30AP110 30XJV40AP110	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Run	I
Lube Oil Pump Suction Strainer	30XJV10AT109 30XJV20AT109 30XJV30AT109 30XJV40AT109	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Engine Sump	30XJV10BB110 30XJV20BB110 30XJV30BB110 30XJV40BB110	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Storage volume	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Lube Oil Tank	30XJV10BB100 30XJV20BB100 30XJV30BB100 30XJV40BB100	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Storage volume	I
Keep-Warm/Prelube Pump Relief Valve	30XJV10AA194 30XJV20AA194 30XJV30AA194 30XJV40AA194	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open	I
Keep-Warm/Prelube Pump	30XJV10AP170 30XJV20AP170 30XJV30AP170 30XJV40AP170	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Stop	II
Lube Oil Keep-Warm Heater	30XJV10AH170 30XJV20AH170 30XJV30AH170 30XJV40AH170	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	De-energize	II
Lube Oil Strainer	30XJV10AT272A 30XJV20AT272A 30XJV30AT272A 30XJV40AT272A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Filter	II
Lube Oil Strainer	30XJV10AT272B 30XJV20AT272B 30XJV30AT272B 30XJV40AT272B	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Filter	II

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Keep-Warm/Prelube Pump Duplex Suction Strainer Selection Valve	30XJV10AA272 30XJV20AA272 30XJV30AA272 30XJV40AA272	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Open, close	II
Air Intake Filter	30XJQ10AT110A 30XJQ20AT110A 30XJQ30AT110A 30XJQ40AT110A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Air Intake Filter	30XJQ10AT110B 30XJQ20AT110B 30XJQ30AT110B 30XJQ40AT110B	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Filter	I
Air Intake Silencer	30XJQ10BS111 30XJQ20BS111 30XJQ30BS111 30XJQ40BS111	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Noise Reduction	I
Air Intake Heater	30XJQ10AH111 30XJQ20AH111 30XJQ30AH111 30XJQ40AH111	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Heater	I
Air Intake Damper	30XJQ10AA112A 30XJQ20AA112A 30XJQ30AA112A 30XJQ40AA112A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Air Intake Damper	30XJQ10AA112B 30XJQ20AA112B 30XJQ30AA112B 30XJQ40AA112B	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open	I
Exhaust Bypass Device	30XJR10AA121 30XJR20AA121 30XJR30AA121 30XJR40AA121	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Provide Engine Exhaust Path	I
Exhaust Silencer	30XJR10BS140 30XJR20BS140 30XJR30BS140 30XJR40BS140	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Noise Reduction	II
Mixing Pipe	30XJR10AM140 30XJR20AM140 30XJR30AM140 30XJR40AM140	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Emission Control	II
Filter	30XJR10AT140 30XJR20AT140 30XJR30AT140 30XJR40AT140	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Filter	II
Filter	30XJR10AT141 30XJR20AT141 30XJR30AT141 30XJR40AT141	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	N/A	Filter	II

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Jacket Water Heat Exchanger	30XJG10AC001 30XJG20AC001 30XJG30AC001 30XJG40AC001	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Heat transfer device	I
Jacket Water Heat Temperature Regulating Valve	30XJG10AA111 30XJG20AA111 30XJG30AA111 30XJG40AA111	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, Close	I
Cooling System Expansion Tank	30XJG10BB001 30XJG20BB001 30XJG30BB001 30XJG40BB001	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Storage volume	I
Fill Valve	30XJG10AA150 30XJG20AA150 30XJG30AA150 30XJG40AA150	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, Close	I
Fill Valve	30XJG10AA151 30XJG20AA151 30XJG30AA151 30XJG40AA151	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, Close	I
Keep Warm Circuit Isolation Valve	30XJG10AA160 30XJG20AA160 30XJG30AA160 30XJG40AA160	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Close	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Keep Warm Circuit Isolation Valve	30XJG10AA161 30XJG20AA161 30XJG30AA161 30XJG40AA161	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Close	I
Check Valve	30XJG10AA201 30XJG20AA201 30XJG30AA201 30XJG40AA201	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, Close	I
Check Valve	30XJG10AA202 30XJG20AA202 30XJG30AA202 30XJG40AA202	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Close	I
Check Valve	30XJG10AA203 30XJG20AA203 30XJG30AA203 30XJG40AA203	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Close	I
Jacket Water Pump	30XJG10AP110 30XJG20AP110 30XJG30AP110 30XJG40AP110	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Run	I
Jacket Water Standby Circulation Pump	30XJG10AP160 30XJG20AP160 30XJG30AP160 30XJG40AP160	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Stop	II

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Jacket Water Standby Heater	30XJG10AH160 30XJG20AH160 30XJG30AH160 30XJG40AH160	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	De-energize	II
Intercooler Water Heat Exchanger	30XJG10AC002 30XJG20AC002 30XJG30AC002 30XJG40AC002	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Heat transfer device	I
Intercooler Temperature Regulating Valve	30XJG10AA121 30XJG20AA121 30XJG30AA121 30XJG40AA121	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, Close	I
Intercooler Cooling Water Pump	30XJG10AP120 30XJG20AP120 30XJG30AP120 30XJG40AP120	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Run	I
Intercooler Combustion Air Heat Exchanger	30XJG10AC120A 30XJG20AC120A 30XJG30AC120A 30XJG40AC120A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Heat transfer device	I
Governor Oil Cooler	30XJG10AC120C 30XJG20AC120C 30XJG30AC120C 30XJG40AC120C	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Heat transfer device	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Generator Bearing Cooler	30XJG10AC170 30XJG20AC170 30XJG30AC170 30XJG40AC170	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Heat transfer device	I
Starting Air Receiver	30XJX10BB001A 30XJX20BB001A 30XJX30BB001A 30XJX40BB001A	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Storage Volume	I
Check Valve	30XJX10AA210 30XJX20AA210 30XJX30AA210 30XJX40AA210	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Check Valve	30XJX10AA211 30XJX20AA211 30XJX30AA211 30XJX40AA211	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Check Valve	30XJX10AA226 30XJX20AA226 30XJX30AA226 30XJX40AA226	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Air Start Valve	30XJX10AA120 30XJX20AA120 30XJX30AA120 30XJX40AA120	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Open	I

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Air Start Pilot Valve	30XJX10AA122 30XJX20AA122 30XJX30AA122 30XJX40AA122	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open	I
Governor Boost Solenoid Valve	30XJX10AA124 30XJX20AA124 30XJX30AA124 30XJX40AA124	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open	I
Starting Air Receiver Blowdown Valve	30XJX10AA411 30XJX20AA411 30XJX30AA411 30XJX40AA411	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	Yes	Open, close	I
Air Dryer	30XJX10AT005 30XJX20AT005 30XJX30AT005 30XJX40AT005	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Moisture Control	II
Filter	30XJX10AT004 30XJX20AT004 30XJX30AT004 30XJX40AT004	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Filter	II
Filter	30XJX10AT003 30XJX20AT003 30XJX30AT003 30XJX40AT003	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Filter	II

Table 2.5.4-1—Emergency Diesel Generator Equipment Mechanical Design (14 Sheets)

Description	Tag Number ⁽¹⁾	Location	ASME Code Section III	Function	Seismic Category
Moisture Separator	30XJX10AT002 30XJX20AT002 30XJX30AT002 30XJX40AT002	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Moisture Control	II
Air Compressor	30XJX10AN001 30XJX20AN001 30XJX30AN001 30XJX40AN001	Division 1 EPGB Division 2 EPGB Division 3 EPGB Division 4 EPGB	No	Supply Starting Air	II

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

**Table 2.5.4-2—Emergency Diesel Generator Support Systems Electrical Equipment Design
(3 Sheets)**

Description	Tag Number ⁽¹⁾	IEEE Class 1E Source	Failure Position	PACS	MCR / RSS Displays	MCR / RSS Controls
Fuel Oil Transfer Pumps	30XJN10AP100 30XJN20AP100 30XJN30AP100 30XJN40AP100	Division 1 Division 2 Division 3 Division 4	N/A	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fuel Oil Pump	30XJN10AP120 30XJN20AP120 30XJN30AP120 30XJN40AP120	Division 1 Division 2 Division 3 Division 4	N/A	Yes	None / None	None / None
Lube Oil System Valves	30XJV10AA170 30XJV20AA170 30XJV30AA170 30XJV40AA170	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None
Lube Oil System Valves	30XJV10AA171 30XJV20AA171 30XJV30AA171 30XJV40AA171	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None
Lube Oil System Valve	30XJV10AA154 30XJV20AA154 30XJV30AA154 30XJV40AA154	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None
Intake Air Damper	30XJQ10AA112A 30XJQ20AA112A 30XJQ30AA112A 30XJQ40AA112A	Division 1 Division 2 Division 3 Division 4	As is	Yes	None / None	None / None

**Table 2.5.4-2—Emergency Diesel Generator Support Systems Electrical Equipment Design
(3 Sheets)**

Description	Tag Number ⁽¹⁾	IEEE Class 1E Source	Failure Position	PACS	MCR / RSS Displays	MCR / RSS Controls
Intake Air Damper	30XJQ10AA112B 30XJQ20AA112B 30XJQ30AA112B 30XJQ40AA112B	Division 1 Division 2 Division 3 Division 4	As is	Yes	None / None	None / None
Keep Warm Circuit Isolation Valve	30XJG10AA160 30XJG20AA160 30XJG30AA160 30XJG40AA160	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None
Keep Warm Circuit Isolation Valve	30XJG10AA161 30XJG20AA161 30XJG30AA161 30XJG40AA161	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None
Fill Valve	30XJG10AA150 30XJG20AA150 30XJG30AA150 30XJG40AA150	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None
Fill Valve	30XJG10AA151 30XJG20AA151 30XJG30AA151 30XJG40AA151	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None
Air Start Pilot Valve	30XJX10AA122 30XJX20AA122 30XJX30AA122 30XJX40AA122	Division 1 Division 2 Division 3 Division 4	Closed	Yes	None / None	None / None

**Table 2.5.4-2—Emergency Diesel Generator Support Systems Electrical Equipment Design
(3 Sheets)**

Description	Tag Number ⁽¹⁾	IEEE Class 1E Source	Failure Position	PACS	MCR / RSS Displays	MCR / RSS Controls
Starting Air Receiver Blowdown Valve	30XJX10AA411	Division 1	Closed	Yes	None / None	None / None
	30XJX20AA411	Division 2				
	30XJX30AA411	Division 3				
	30XJX40AA411	Division 4				
Governor Boost Valve Solenoid	30XJX10AA124	Division 1	Closed	Yes	None / None	None / None
	30XJX20AA124	Division 2				
	30XJX30AA124	Division 3				
	30XJX40AA124	Division 4				

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

Table 2.5.4-3—Emergency Diesel Generator Electrical Equipment Design

Description	Tag Number ⁽¹⁾	MCR / RSS Displays	MCR / RSS Controls
Emergency Diesel Generator	30XKA10AG ⁽²⁾	Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm / Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm.	Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower / Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower
Emergency Diesel Generator	30XKA20AG ⁽²⁾	Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm / Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm.	Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower / Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower
Emergency Diesel Generator	30XKA30AG ⁽²⁾	Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm / Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm.	Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower / Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower
Emergency Diesel Generator	30XKA40AG ⁽²⁾	Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm / Generator voltage, current, frequency, power, reactive power. Engine running, not running, tripped, general EDG trouble alarm.	Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower / Generator output voltage raise-lower, output breaker close-trip. Engine start-stop-emergency trip, governor raise-lower

- 1) Equipment tag numbers are provided for information only and are not part of the certified design.
- 2) Emergency Diesel Generators are Class 1E.

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the EDG fuel oil storage and transfer system is as shown on Figure 2.5.4-1.	An inspection of the as-built system will be performed.	The as-built EDG fuel oil storage and transfer system conforms to the functional arrangement as shown on Figure 2.5.4-1.
2.2	EDGs and respective support systems are located as listed in Table 2.5.4-1.	An inspection will be performed.	EDGs listed in Table 2.5.4-1 and respective support systems are located as listed in Table 2.5.4-1.
2.3	Deleted.	Deleted.	Deleted.
2.4	The functional arrangement of the EDG lubricating oil system is as shown on Figure 2.5.4-2	An inspection of the as-built system will be performed.	The as-built EDG lubricating oil system conforms to the functional arrangement as shown on Figure 2.5.4-2.
2.5	The functional arrangement of the EDG air intake and exhaust system is as shown on Figure 2.5.4-3.	An inspection of the as-built system will be performed.	The as-built EDG air intake and exhaust system conforms to the functional arrangement as shown on Figure 2.5.4-3.
2.6	The functional arrangement of the EDG cooling water system is as shown on Figure 2.5.4-4.	An inspection of the as-built system will be performed.	The as-built EDG cooling water system conforms to the functional arrangement as shown on Figure 2.5.4-4.
2.7	The functional arrangement of the EDG starting air system is as shown on Figure 2.5.4-5.	An inspection of the as-built system will be performed.	The as-built EDG starting air system conforms to the functional arrangement as shown on Figure 2.5.4-5.
3.1	Deleted.	Deleted.	Deleted.
3.2	Deleted.	Deleted.	Deleted.
3.3	Deleted.	Deleted.	Deleted.
3.4	Deleted.	Deleted.	Deleted.
3.5	Deleted.	Deleted.	Deleted.
3.6	Deleted.	Deleted.	Deleted.

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.7	Components identified as Seismic Category I in Table 2.5.4-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.5.4-1.	<p>a. Type tests, analyses, or a combination of type tests and analyses will be performed on the components identified as Seismic Category I in Table 2.5.4-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements.</p> <p>b. Inspections will be performed of the Seismic Category I components identified in Table 2.5.4-1 to verify that the components, including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).</p>	<p>a. Seismic qualification reports (SQDP, EQDP, or analyses) exist and conclude that the Seismic Category I components identified in Table 2.5.4-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.5.4-1 including the time required to perform the listed function.</p> <p>b. Inspection reports exist and conclude that the Seismic Category I components identified in Table 2.5.4-1, including anchorage, are installed as specified on the construction drawings and deviations have been reconciled to the seismic qualification reports (SQDP, EQDP, or analyses).</p>
3.8	Deleted.	Deleted.	Deleted.
3.9	Each EDG has a fuel oil storage tank.	An inspection and analysis will be performed.	Each EDG fuel oil storage tank capacity is greater than the volume of fuel oil consumed by the EDG operating at the continuous rating for seven days.
3.10	Each EDG has a fuel oil day tank.	An inspection and analysis will be performed.	Each EDG fuel oil day tank capacity is greater than the volume of fuel oil consumed by the EDG operating at the continuous rating for two hours.

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.11	Each fuel oil transfer pump capacity is greater than EDG fuel oil consumption at the continuous rating.	A test will be performed.	The capacity of each fuel oil transfer pump is greater than EDG fuel oil consumption at the continuous rating.
3.12	Each EDG starting air system is capable of providing air to start the respective EDG without being recharged.	A test will be performed.	Each EDG starts five consecutive times without recharging respective starting air receivers between EDG starts.
3.13	Check valves listed in Table 2.5.4-1 will function as listed in Table 2.5.4-1.	Tests will be performed for the operation of the check valves listed in Table 2.5.4-1.	The check valves listed in Table 2.5.4-1 perform the functions listed in Table 2.5.4-1.
3.14	Each EDG lubricating oil system provides lubrication to the engine and turbocharger wearing parts during engine operation.	Analysis and tests will be performed.	<ul style="list-style-type: none"> a. Analysis demonstrates each EDG lubricating oil system oil volume is capable of supporting at least 7 days of full load operation. b. A test report concludes each EDG and lubricating oil system operating at rated load conditions achieves stable temperatures and pressures within EDG manufacturers recommendations.
3.15	Each EDG exhaust path has a bypass exhaust path.	Analysis or type tests will be performed on the EDG exhaust bypass device.	Analysis or type test results conclude that the EDG rupture disk will rupture within the pressure limits defined by the EDG manufacturer.
3.16	EDG piping shown as ASME Code Section III on Figure 2.5.4-1 Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 is designed in accordance with ASME Code Section III requirements.	Inspections of the ASME Code Section III Design Reports (NCA-3550) and associated reference documents will be performed. {{DAC}}	ASME Code Section III Design Reports (NCA-3550) exist and conclude that EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 complies with ASME Code Section III requirements. {{DAC}}

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.17	EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 is installed in accordance with an ASME Code Section III Design Report.	Analyses to reconcile as-built deviations to the ASME Code Design Reports (NCA-3550) will be performed. Piping analyzed using time-history methods will be reconciled to the as-built information.	For EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5, ASME Code Data Reports (N-5) exist and conclude that design reconciliation (NCA-3554) has been completed in accordance with the ASME Code Section III for the as-built system. The report(s) document the as-built condition.
3.18	Pressure boundary welds in EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 are in accordance with ASME Code Section III.	Inspections of pressure boundary welds verify that welding is performed in accordance with ASME Code Section III requirements.	ASME Code Section III Data Reports exist and conclude that pressure boundary welding for EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 has been performed in accordance with ASME Code Section III.
3.19	EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 retains pressure boundary integrity at design pressure.	Hydrostatic tests will be performed on the as-built system.	For EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5, ASME Code Section III Data Reports exist and conclude that hydrostatic test results comply with ASME Code Section III requirements.
3.20	EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5 is installed and inspected in accordance with ASME Code Section III requirements.	An inspection of the as-built piping will be performed.	For EDG piping shown as ASME Code Section III on Figure 2.5.4-1, Figure 2.5.4-2, Figure 2.5.4-3, Figure 2.5.4-4, and Figure 2.5.4-5, N-5 Data Reports exist and conclude that installation and inspection are in accordance with ASME Code Section III requirements.

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.21	Components listed in Table 2.5.4-1 as ASME Code Section III are designed in accordance with ASME Code Section III requirements.	Inspections will be performed for the existence of ASME Code Section III Design Reports.	ASME Code Section III Design Reports (NCA-3550) exist for components listed as ASME Code Section III in Table 2.5.4-1.
3.22	Components listed in Table 2.5.4-1 as ASME Code Section III are fabricated in accordance with ASME Code Section III requirements.	Inspections will be performed to verify that the design report has been revised to reflect as-built deviations from the design if applicable.	For components listed as ASME Code Section III in Table 2.5.4-1, the as-built component satisfies design requirements of ASME Code Section III as demonstrated in the Design Report (NCA-3550).
3.23	Pressure boundary welds on components listed in Table 2.5.4-1 as ASME Code Section III are in accordance with ASME Code Section III requirements.	Inspections of pressure boundary welds will be performed to verify that welding is performed in accordance with ASME Code Section III requirements.	For components listed as ASME Code Section III in Table 2.5.4-1, ASME Code Section III Data Reports (NCA-8000) exist and conclude that pressure boundary welding has been performed in accordance with ASME Code Section III.
3.24	Components listed in Table 2.5.4-1 as ASME Code Section III retain pressure boundary integrity at design pressure.	Hydrostatic tests will be performed on the components.	For components listed as ASME Code Section III in Table 2.5.4-1, ASME Code Section III Data Reports exist and conclude that hydrostatic test results comply with ASME Code Section III requirements.
4.1	Displays listed in Table 2.5.4-2 and Table 2.5.4-3 are retrievable in the MCR and RSS as listed in Table 2.5.4-2 and Table 2.5.4-3.	A test will be performed.	<ul style="list-style-type: none"> a. Displays listed in Table 2.5.4-2 and Table 2.5.4-3 as being retrievable in the MCR can be retrieved in the MCR. b. Displays listed in Table 2.5.4-2 and Table 2.5.4-3 as being retrievable in the RSS can be retrieved in the RSS.

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.2	EDG equipment controls are provided in the MCR and RSS as listed in Table 2.5.4-2 and Table 2.5.4-3.	A test will be performed.	<ul style="list-style-type: none"> a. Controls listed in Table 2.5.4-2 and Table 2.5.4-3 as being in the MCR exist in the MCR. b. Controls listed in Table 2.5.4-2 and Table 2.5.4-3 as being in the RSS exist in the RSS.
4.3	Equipment listed as being controlled by a PACS module in Table 2.5.4-2 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 2.5.4-2 responds to the state requested by the signal.
5.1	The EDG control power is provided by the EUPS system from the respective division.	A test will be performed on each EDG system by providing a test signal in only one division.	The test signal exists in only the EDG system under test when a test signal is applied in each EDG system.
5.2	The components identified as Class 1E in Table 2.5.4-2 are powered from the Class 1E division listed in Table 2.5.4-2.	A test will be performed for components identified as Class 1E in Table 2.5.4-2 by providing a test signal in each division.	The test signal provided in each division is present at the respective Class 1E components identified in Table 2.5.4-2.
5.3	Each EDG output rating is greater than the analyzed loads assigned in the respective EPSS division and loads capable of being connected to the EPSS division through the alternate feed.	<ul style="list-style-type: none"> a. An analysis will be performed. b. A test will be performed. 	<ul style="list-style-type: none"> a. Analysis concludes each specified EDG output rating is greater than the analyzed loads assigned in the respective EPSS divisions and loads capable of being connected to the EPSS division through the alternate feed. b. Each installed EDG provides an output power capacity greater than the analyzed loads.
5.4	Valves listed in Table 2.5.4-2 fail to the position as shown in Table 2.5.4-2 on loss of power.	Testing will be performed for the valves listed in Table 2.5.4-2 to verify the position of valves on loss of power.	Following the loss of power, the valves listed in Table 2.5.4-2 fail to the position as shown in Table 2.5.4-2.

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
6.1	Each EDG is started by a protection system LOOP signal from the respective EPSS division medium voltage bus.	A test will be performed.	Each EDG is started by a protection system LOOP signal from the respective EPSS division medium voltage bus, achieves rated speed and voltage and connects to the assigned EPSS bus in ≤ 15 Seconds.
6.2	Each EDG is started by a protection system SIS actuation signal.	A test will be performed.	Each EDG is started by a protection system SIS actuation signal, achieves rated speed and voltage and remains disconnected from the EPSS.
6.3	Each EDG will start and connect to the respective EPSS division medium voltage bus in an undervoltage condition concurrent with a SIS actuation signal.	A test will be performed.	Each EDG starts and connects to the respective EPSS division medium voltage bus in an undervoltage condition concurrent with a SIS actuation signal. As loads are sequenced onto EPSS buses, EDG nominal output voltage and frequency remain ≥ 75 percent and 95 percent, respectively. Voltage and frequency are restored to within 10 percent and 2 percent nominal, respectively within 60 percent of each load sequence step.
6.4	The EDG lubricating oil system heat exchanger as listed in Table 2.5.4-1 have the capacity to transfer the design heat load to the essential service water system.	Analysis will be performed to demonstrate the capability of the EDG lubricating oil system heat exchangers as listed in Table 2.5.4-1 to transfer the design heat load to the essential service water system.	The EDG lubricating oil system has the capacity to remove the design heat load specified by the EDG manufacturer via the heat exchangers listed in Table 2.5.4-1.

**Table 2.5.4-4—Emergency Diesel Generator ITAAC
(8 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
6.5	Class 1E valves listed in Table 2.5.4-2 can perform the function listed in Table 2.5.4-1 under system operating conditions.	Tests and analyses or a combination of tests and analyses will be performed to demonstrate the ability of the valves listed in Table 2.5.4-2 to change position as listed in Table 2.5.4-1 under system operating conditions.	The valves change position as listed in Table 2.5.4-1 under system operating conditions.
6.6	The EDG cooling water system heat exchangers as listed in Table 2.5.4-1 have the capacity to transfer the design heat load to the essential service water.	Analysis will be performed to demonstrate the capability of the EDG cooling water system heat exchangers as listed in Table 2.5.4-1 to transfer the design heat load to the essential service water system.	The EDG cooling water system has the capacity to remove the design heat load specified by the EDG manufacturer via the heat exchangers as listed in Table 2.5.4-1.
6.7	Each EDG is capable of starting from standby conditions and achieving required voltage and frequency.	A test will be performed.	Each EDG starts from standby conditions and achieves voltage ≥ 6555 V and frequency ≥ 58.8 Hz in ≤ 15 seconds; and steady state voltage ≥ 6555 V and ≤ 7260 V, frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Next File