



Shoreline Fire Department Standard
SHFDS 4.0
Emergency and Standby Power System
Revised 2/26/2026

4.0 General

4.1. Scope:

This standard covers the permitting, installation, inspection testing and maintenance of Emergency and Standby Power Systems in the Cities of Shoreline, Kenmore, Lake Forest Park and the Town of Woodway as administered by the Fire Code Official (FCO). Emergency and Standby Power System shall meet the requirements of the currently adopted codes and standards, unless specifically amended, or noted otherwise, and as approved by the fire code official.

Referenced Codes and Standards

1. NFPA 110, Standard for Emergency and Standby Power Systems.
2. NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems.
3. NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines.
4. NFPA 54, National Fuel Gas Code
5. NFPA 58, Liquefied Petroleum Gas Code
6. NFPA 70, National Electric Code
7. The International Fire Code (IFC), as amended by the State of Washington, the Cities of Shoreline, The Town of Woodway, Kenmore, and Lake Forest Park Municipal Code.
8. NFPA 72 National Fire Alarm and Signaling Code

4.1.1 Emergency Standby Power System

1. Emergency and Standby Power Systems shall be designed under the currently adopted codes and standards.
2. The system designer shall be familiar with currently adopted Washington State Codes and all referenced NFPA standards associated with Emergency and Standby Power Systems. System designer shall possess the required engineering certification as required by the State of Washington.
3. All plans and calculations shall be stamped with a valid Washington State certificate seal identifying the designer's appropriate level of competency.

4.1.2 System Design Requirements

If required by the International Fire Code (IFC), International Building Code (IBC) or Municipal Code, Back-Up Emergency Power shall be provided by a level 1 Type Ten, Class 48 generator unless otherwise specified by the IFC, IBC, or the AHJ.

In-Building Design:

1. Electrical wiring shall be in accordance with NFPA 70.
2. Fuel lines supplying a generator set inside the building shall be separated from areas of the building other than the room the generator is located in by one of the following methods:
 - a. Schedule 40 piping that is double wall contained meeting UL 1369 listing for above ground piping for flammable and combustible liquids.
 - b. Flexible, double wall piping meeting UL 1369 listing for above ground piping for flammable and combustible liquids.
3. The EPSS room shall be separated from the rest of the building by construction with a 2-hour fire resistance rating.
4. No other equipment including architectural appurtenances, except those that serve this space, shall be permitted in the EPSS room.
5. *Emergency power systems* shall automatically provide secondary power within 10 seconds after primary power is lost, unless specified otherwise in the International Fire Code.
6. *Standby power systems* shall automatically provide secondary power within 60 seconds after primary power is lost, unless specified otherwise in the International Fire Code.
7. Emergency power systems and standby power systems shall be designed to provide the required power for a minimum duration of 2 hours without being refueled or recharged, unless specified otherwise in the International Fire Code.
8. An uninterrupted source of power shall be provided for equipment where required by the manufacturer's instructions, the listing, the International Fire Code or applicable referenced standards.
9. Level 1 EPSS equipment shall not be installed in the same room with normal service equipment, where the service equipment is rated over 150 volts to ground and equal to or greater than 1000 amperes.
10. The rooms, enclosures, or separate buildings housing Level 1 or Level 2 EPSS equipment shall be designed and located to minimize damage from flooding, including that caused by the following:
 - a. Flooding resulting from firefighting
 - b. Sewer water backup
 - c. Other disasters or occurrences
11. Minimizing the possibility of damage resulting from interruptions of the emergency sources shall be a design consideration for EPSS equipment.

12. EPSS equipment shall be installed in a location that permits ready accessibility and a minimum of 36 inches from the skid rails outermost point in the direction of access for inspection, repair, maintenance, cleaning, or replacement.
13. Structure bases shall raise the engine at least 6 inches above the floor or grade level and be of sufficient elevation to facilitate lubricating oil drainage and ease of maintenance.
14. Heating and Cooling
 - a. With the EPS running at rated load, ventilation airflow shall be provided to limit the maximum air temperature in the EPS room or the enclosure housing the unit to the maximum ambient air temperature required by the EPS manufacturer.
 - b. Air shall be supplied to the EPS equipment for proper operation.
 - c. For EPS supplying Level 1 EPSS, ventilation air shall be supplied directly from a source outside the building by an exterior wall opening or from a source outside the building by a 2-hour fire-rated transfer system.
 - d. For EPS supplying Level 1 EPSS, discharge air shall be directed outside the building by an exterior wall opening or from a source outside the building by a 2-hour fire-rated air transfer system.
 - e. Fire dampers, shutters, or other self-closing devices shall not be permitted in ventilation openings or ductwork for supply or return/discharge air to EPS equipment for Level 1 EPSS.
 - f. Ventilation air supply shall be from outdoors or from a source outside the building by an exterior wall opening or from a source outside the building by a 2- hour fire-rated air transfer system.
 - g. Ventilation air shall be provided to supply and discharge cooling air from radiator cooling of the EPS when running at rated load.
 - h. Ventilation air supply and discharge for radiator cooled EPS shall have a maximum static restriction of 125 Pa (0.5 in. of water column) in the discharge duct at the radiator outlet.
15. Fuel Tanks
 - a. Fuel tanks shall be sized to accommodate the specific EPS class.
 - b. All fuel tanks and systems intended for use with rotating equipment shall be installed and maintained in accordance with NFPA 30, NFPA 37, NFPA 54 and NFPA 58.
 - c. Fuel tanks shall comply with the following:
 - i. Be close enough to the energy converter for the fuel lift (i.e., suction head) of the energy converter fuel pump to meet the fuel system requirements.
 - ii. Be provided with a fuel transfer pump and day tank.
 - iii. Day tanks on diesel systems shall be installed below the engine fuel return elevation.
 - iv. The return line to the day tank shall be below the fuel return elevation.
 - v. Where the gas supply is connected to the building gas supply system, it shall be connected on the supply side of the main gas shutoff valve and marked as supplying an emergency generator.

- vi. The buildings main gas shut off valve shall be marked or tagged to indicate the existence of the separate EPS shutoff valve.
- d. Over Fill Protection:
 - i. Fuel tank fill station shall be provided and meet the requirements of NFPA 30 including fuel overfill protection requirements. Example: [M400 Fuel Fill Station for Single or Multiple Above Ground Tanks | Earthsafe](#)
 - ii. Overfill Protection shall have two local alarms, 90 percent high and 95% high-high. During initial fuel filling, tanks filled to 95% or greater will be required to be leveled to 90%.

16. Exhaust system:

- a. The exhaust system equipment and installation, including piping, muffler, and related accessories for combustion engines and gas turbines, shall be in accordance with NFPA 37 and other applicable codes.
- b. Exhaust system installation shall be gastight to prevent exhaust gas fumes from entering inhabited rooms or buildings and terminate in such a manner that toxic fumes cannot re-enter a building or structure, particularly through windows, air ventilation inlets, or the engine air-intake system.
- c. A condenser trap and drain valve shall be provided at the low point of the piping unless the piping is self-draining.
- d. Design consideration shall be given to thermal expansion and the resultant movement of the piping.
- e. For reciprocating engines, mufflers shall be placed as close as practical to the engine, in a horizontal position if possible.
- f. An approved thimble(s) shall be used where exhaust piping passes through combustible walls or partitions.
- g. For reciprocating engines, piping shall terminate in any of the following ways:
 - i. Rain Cap
 - ii. Tee
 - iii. Ell, pointing downward from the prevailing wind
 - iv. Vertically upward-oriented stack with suitable provisions for trapping and draining rain and snow water.
- h. Design consideration shall be given to the potential heat effect due to proximity to all the following:
 - i. Conduit runs
 - ii. Fuel Piping
 - iii. Lighting fixtures
 - iv. Design consideration shall be given to insulating the energy converter exhaust system in buildings after the flexible section.

17. Monitoring:

- a. EPSS shall be monitored by the fire alarm system in the building per NFPA 72 10.6.9.1.1, 10.15 and this standard.

Out Door Installation:

1. Electrical wiring shall be in accordance with NFPA 70.
2. Emergency power systems shall automatically provide secondary power within 10 seconds after primary power is lost, unless specified otherwise in the International Fire Code.
3. Standby power systems shall automatically provide secondary power within 60 seconds after primary power is lost, unless specified otherwise in the International Fire Code.
4. Emergency power systems and standby power systems shall be designed to provide the required power for a minimum duration of 2 hours without being refueled or recharged, unless specified otherwise in the International Fire Code.
5. An uninterrupted source of power shall be provided for equipment where required by the manufacturer's instructions, the listing, the International Fire Code or applicable referenced standards.
6. Minimizing the possibility of damage resulting from interruptions of the emergency sources shall be a design consideration for EPSS equipment.
7. EPSS equipment shall be installed in a location that permits ready accessibility and a minimum of 36 inches from the skid rails outermost point in the direction of access for inspection, repair, maintenance, cleaning, or replacement.
8. Structure bases shall raise the engine at least 6 inches above the floor or grade level and be of sufficient elevation to facilitate lubricating oil drainage and ease of maintenance.
9. Fuel Tanks:
 - a. Fuel tanks shall be sized to accommodate the specific EPS class.
 - b. All fuel tanks and systems intended for use with rotating equipment shall be installed and maintained in accordance with NFPA 30, NFPA 37, NFPA 54 and NFPA 58.
 - c. Fuel tanks shall comply with the following:
 - i. Be close enough to the energy converter for the fuel lift (i.e., suction head) of the energy converter fuel pump to meet the fuel system requirements.
 - ii. Be provided with a fuel transfer pump and day tank.
 - iii. Day tanks on diesel systems shall be installed below the engine fuel return elevation.
 - iv. The return line to the day tank shall be below the fuel return elevation.
 - v. Where the gas supply is connected to the building gas supply system, it shall be connected on the supply side of the main gas shutoff valve and marked as supplying an emergency generator.
 - vi. The building's main gas shut off valve shall be marked or tagged to indicate the existence of the separate EPS shutoff valve.

- vii. Fuel tank vent pipes shall be installed as required by NFPA 30, terminate 12 ft. above the adjacent ground level, located and directed so that vapors will not accumulate or travel to an unsafe location, enter building opening, or be trapped under eaves and shall be at least 5 ft. from building openings and at least 15 ft. from powered ventilation air intake devices.

10. Over fill Protection:

- a. Fuel tank fill station shall be provided and meet the requirements of NFPA 30 including fuel overfill protection requirements.
- b. Overfill Protection shall have two local alarms, 90 percent high and 95% high-high. During initial fuel filling, tanks filled to 95% or greater will be required to be leveled to 90%.

11. Exhaust system:

- a. The exhaust system equipment and installation, including piping, muffler, and related accessories for combustion engines and gas turbines, shall be in accordance with NFPA 37 and other applicable codes.
- b. Exhaust system installation shall be gastight to prevent exhaust gas fumes from entering inhabited rooms or buildings and terminate in such a manner that toxic fumes cannot re-enter a building or structure, particularly through windows, air ventilation inlets, or the engine air-intake system.
- c. A condenser trap and drain valve shall be provided at the low point of the piping unless the piping is self-draining.
- d. Design consideration shall be given to thermal expansion and the resultant movement of the piping.
- e. For reciprocating engines, mufflers shall be placed as close as practical to the engine, in a horizontal position if possible.
- f. An approved thimble(s) shall be used where exhaust piping passes through combustible walls or partitions.
 - i. For reciprocating engines, piping shall terminate in any of the following ways:
 - ii. Rain Cap
 - iii. Tee
 - iv. Ell, pointing downward from the prevailing wind
 - v. Vertically upward-oriented stack with suitable provisions for trapping and draining rain and snow water.
 - vi. Design consideration shall be given to the potential heat effect due to proximity to all the following:
 - 1. Conduit runs
 - 2. Fuel Piping
 - 3. Lighting fixtures
 - vii. Design consideration shall be given to insulating the energy converter exhaust system in buildings after the flexible section.
- g. Monitoring:
 - i. EPSS shall be monitored by the fire alarm system in the building per NFPA 72 10.6.9.1.1, 10.15 and this standard.

4.1.3 Permit requirements

A fire permit is required for all new installations and/or modification work. Installation shall not begin until the permit has been issued. For work being conducted in the City of Shoreline, the application for a fire construction permit is available at: [Get a Permit | City of Shoreline](#). For work being conducted in the City of Kenmore or Lake Forest Park the application for a fire construction permit is available at: [Fire Permit Application - Shoreline Fire Department](#). Approved plans and permit inspection cards shall be available onsite for the permitted work. A permit is only valid for the contractor and work designated by the permit

4.1.4 Permit Submittal Requirements

The following is a list of information required on all plan submittals for review of the installation of Emergency and Standby Power Systems permit application. The plan shall be drawn in 1/8" = 1.0' minimum scale. The applicant is required to submit all of the information so an accurate and timely review may be done:

12. Copy of a scaled floor plan showing compliance with the 2021 IFC Section 1203. Plans shall include the following:
 - a. System location, name and address of installing contractor.
 - b. Indicate the generator type as either Level 1 or Level 2
 - c. When an emergency back -up generator is required per the International Fire Code or adopted municipal fire code, a Level 1, Class 2, Type 10 Emergency generator is required.
 - d. Stationary emergency and standby power generators required by applicable codes and/or the Fire Code Official shall be listed in accordance with UL 2200.
 - e. Indicate the energy source for the generator (Natural Gas or Diesel).
 - If being powered by diesel, plans shall indicate fuel fill pipe diagram including location of fuel fill piping from fuel fill station to fuel tank, fuel fill location site, and cut sheets for fuel fill lift station. Fuel fill lift station shall meet the requirements set forth in this standard.
 - f. Provide a written description of the intent for the installation and what systems it will generate power too.
 - g. Site plan drawing of the site location and conditions, to include:
 - All buildings and structures
 - Fire lanes and fire hydrants.
 - Location of the generator with regards to building façade and exists.
 - Location of the lot lines and distance from the lot lines.
 - h. Building construction drawings if located within the building, to include:

- Construction of the room (two-hour rating required).
 - Intake and exhaust air locations of the generator.
 - Electrical and fuel supply pipping plan.
- i. Manufacturer’s data sheets for the generator, transfer switches, controllers, and any other equipment associated with the generator installation.
 - j. Electrical on-line drawings and panel board schedules.
 - k. Indicate any batteries and battery chargers on the generator for the purpose of charge and/or starting.
 - l. Drawings shall be generated by the installing company specific to the installation operation. Drawings shall show plan view and other pertinent information.

4.1.5 Inspections and Acceptance Testing

New EPSS systems shall be inspected and tested by a representative from the Shoreline Fire Department. The following is a list of recommended inspection steps to perform for system acceptance.

1. Fire inspections are required by the Shoreline Fire Department for permitted work. For scheduling an inspection, please email the Shoreline Fire Department at inspections@shorelinefire.com. Response times and scheduling may vary depending on current workloads.
2. Upon completion of the installation of the EPSS, the EPS shall be tested to ensure conformity to the requirements of the standards outlined in this standard with respect to both power output and function.
3. An on-site acceptance test shall be conducted as a final approval test for all EPSS’s.
4. For new Level 1 installations, the EPSS shall not be considered as meeting this standard until the acceptance tests have been conducted and test requirements met.
5. The test shall be conducted after completion of the installation with all EPSS accessory and support equipment in place and operating.
6. The Shoreline Fire Department Fire Marshal’s Office shall be given advance notification of the time at which the acceptance test is to be performed so that a Shoreline Fire Inspector can witness the test.
7. The EPSS shall perform within the limits specified by the applicable standards. For generator-based EPSS, compliance shall be determined by the requirements of NFPA 110 7.13.4.3 through 7.13.4.8.
8. A written schedule for routine maintenance and operational testing shall be provided to the building owner.
9. At the completion of commissioning and acceptance testing, the contractor responsible for commissioning shall upload all required documentation and commissioning reports to The Compliance Engine (Brycer) before the permit will be finalized and closed out.

4.1.6 System Inspection, Testing, and Maintenance

Routine Maintenance and operational testing programs shall be based on Manufacturer's recommendations, instruction manuals, minimum requirements of Chapter 8 of NFPA 110 and the Fire Code Official.

Contractors performing inspection, testing and maintenance (ITM) Shall submit all reports to The Compliance Engine within (5) five business days at the completion of work.

1. A written schedule for routine maintenance and operational testing of the EPSS shall be established.
2. Engine Generator sets supplying emergency or stand-by power to fire pump assemblies shall be periodically tested in accordance NPFA 110. Records shall be maintained and uploaded to The Compliance Engine.
3. Automatic transfer Switches shall be periodically tested in accordance with NFPA 110. Records shall be maintained and uploaded to The Compliance Engine.
4. Tests of the pump room environmental conditions, including heating, ventilation and illumination, shall be made to ensure proper manual or automatic operation of the associated equipment.