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(2) Is used only for the industrial function of the vessel;

(3) Is not connected to the emergency power source; and

(4) Does not have specific requirements addressed elsewhere in this subchapter.

(b) An industrial system that meets the applicable requirements of NFPA NEC 2002 (incorporated by reference, see 46 CFR 110.10–1) must meet only the following:

(1) The switchgear standards in part 110, subpart 110.10, of this chapter.

(2) Part 110, subpart 110.25, of this chapter—Plan Submittal.

(3) Subpart 111.01 of this part—General.

(4) Subpart 111.05 of this part—Equipment Ground, Ground Detection, and Grounded Systems.

(5) Sections 111.12–1(b) and 111.12–1(c)—Prime movers.

(6) Subpart 111.105 of this part—Hazardous Locations.

(c) Cables that penetrate a watertight or fire boundary deck or bulkhead must—

(1) Be installed in accordance with 46 CFR 111.60–5 and meet the flammability-test requirements of either IEEE 1202 or Category A of IEC 60332–3–22 (both incorporated by reference; see 46 CFR 110.10–1); or

(2) Be specialty cable installed in accordance with §111.60–2.

[CGD 94–108, 61 FR 28286, June 4, 1996, as amended at 62 FR 23910, May 1, 1997; USCG–2003–16630, 73 FR 65201, Oct. 31, 2008]

**PART 112—EMERGENCY LIGHTING AND POWER SYSTEMS**

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## Subpart 112.01—Definitions of Emergency Lighting and Power Systems

### § 112.01-1 Purpose.

The purpose of this subpart is to define types of emergency lighting and power systems.

### § 112.01-5 Manual emergency lighting and power system.

A manual emergency lighting and power system is one in which a single manual operation, such as the manual operation of a switch from an “off” to an “on” position, is necessary to cause the emergency power source to supply power to the emergency loads.

### § 112.01-10 Automatic emergency lighting and power system.

An automatic emergency lighting and power system is one in which a reduction in potential from the ship’s service power and lighting plant causes the emergency power source to supply power to the emergency loads.

### § 112.01-15 Temporary emergency power source.

A temporary emergency power source is one of limited capacity that carries, for a short time, selected emergency loads while an emergency power source of larger capacity is being started.

### § 112.01-20 Final emergency power source.

A final emergency power source is one that functions after the temporary emergency power source is disconnected.

## Subpart 112.05—General

### § 112.05-1 Purpose.

(a) The purpose of this part is to ensure a dependable, independent, and dedicated emergency power source with sufficient capacity to supply those services that are necessary for the safety of the passengers, crew, and other persons in an emergency and those additional loads that may be authorized under paragraph (c) of this section.

(b) No load may be powered from an emergency power source, except:

(1) A load required by this part to be powered from the emergency power source;

(2) A bus-tie to the main switchboard that meets § 112.05-3; and

(3) Emergency loads that may be necessary to maintain or restore the propulsion plant, such as control systems, controllable pitch propellers, hydraulic pumps, control air compressors, and machinery necessary for dead-ship start-up.

(c) Other loads may be authorized by the Commanding Officer, Marine Safety Center (MSC), to be connected to the emergency source of power to provide an increased level of safety in recognition of a unique vessel mission or

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configuration. When these loads are authorized, the emergency power source must—

(1) Be sized to supply these loads using a unity (1.0) service factor; or

(2) Be provided with automatic load shedding that removes these loads and operates before the emergency generator trips due to overload. The automatic load shedding circuit breakers must be manually reset.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28286, June 4, 1996; 61 FR 36787, July 12, 1996]

**§ 112.05-3 Main-emergency bus-tie.**

Each bus-tie between a main switchboard and an emergency switchboard must:

(a) Disconnect automatically upon loss of potential at the emergency switchboard;

(b) Be arranged to prevent parallel operation of an emergency power source with any other source of electric power, except for interlock systems for momentary transfer of loads; and

(c) If arranged for feedback operation, open automatically upon overload of the emergency power source before the emergency power source is tripped off the line from the overload.

**§ 112.05-5 Emergency power source.**

(a) The emergency power source must meet table 112.05-5(a) and have the capacity to supply all loads that are simultaneously connected to it, except a load on a bus-tie to the main switchboard or non-required loads that are connected in accordance with § 112.05-1(c).

TABLE 112.05-5(a)

Size of vessel and service	Type of emergency power source or lighting	Period of operation and minimum capacity of emergency power
<b>Passenger vessels:</b> Ocean, Great Lakes, or coastwise; or on an international voyage.  Other than Ocean, Great Lakes, or coastwise and not on an international voyage.	Temporary emergency power source; and final emergency power source (automatically connected storage battery or an automatically started generator).  Final emergency power source (automatically connected storage battery or an automatically started generator).	36 hours. <sup>1 2</sup>  8 hours or twice the time of run, whichever is less. <sup>2</sup>
<b>Cargo vessels; miscellaneous self-propelled vessels; tankships; barges with sleeping accommodations for more than 6 persons; mobile offshore drilling units; and oceanographic vessels:</b> Ocean, Great Lakes, or coastwise and 500 GT or more; on an international voyage and 500 GT or more; or all waters and 1600 GT or more. Ocean, Great Lakes, or coastwise and less than 500 GT; or other than ocean, Great Lakes, or coastwise, 300 GT or more but less than 1600 GT, and not on an international voyage..	Final emergency power source (automatically connected storage battery or an automatically started generator).  Emergency lighting provided by an automatically connected or manually controlled storage battery; automatically or manually started generator; or relay-controlled, battery-operated lanterns. <sup>3 4</sup>	18 hours. <sup>1 2</sup>  6 hours or twice the time of run, whichever is less.

<sup>1</sup>A 12-hour power supply may be especially considered for vessels engaged regularly in voyages of short duration.  
<sup>2</sup>The capacity for the operation of the steering gear, as required by § 111.93, is for a period of 30 minutes continuous operation.  
<sup>3</sup>The emergency lighting requirements of § 112.15-1 (b), (c), (f), and (g) must be met.  
<sup>4</sup>Requirements of Subpart 112.39 must be met by the relay-controlled, battery-operated lanterns.

(b) The emergency power source must be independent of the ship's service lighting and powerplant and propulsion plant, except for the compressed air starting means allowed in § 112.50-7(c)(3)(i). A stop control for an emergency generator must be only in the space that has the emergency generator, except a remote mechanical reach rod is permitted for the fuel oil shut-off

valve to an independent fuel oil tank located in the space.

(c) The complete emergency installation must function at full rated power when the vessel is upright or inclined to the maximum angle of heel that results from the assumed damage defined in 33 CFR part 155 or in subchapter S of this chapter for the specific vessel type or 22.5 degrees, whichever is greater;

when the trim of the ship is 10 degrees, either in the fore or aft direction, or is in any combination of angles within those limits.

(d) The emergency power source, its associated transforming equipment, and the emergency switchboard must be located aft of the collision bulkhead, outside of the machinery casing, and above the uppermost continuous deck. Each compartment containing this equipment must be readily accessible from the open deck and must not contain machinery not associated with, or equipment not in support of, the normal operation of the emergency power source. Equipment in support of the normal operation of the emergency power source includes, but is not limited to, ventilation fans, CO<sub>2</sub> bottles, space heaters, and internal communication devices, such as sound powered phones.

(e) No compartment that has an emergency power source or its vital components may adjoin a Category A machinery space or those spaces containing the main source of electrical power and its vital components.

(f) Except for a cable for connecting equipment in the engine room or boiler room, no cable supplied from the emergency switchboard may penetrate the boundaries of the engine room, boiler room, uptakes, or casings of these spaces. These cables must be kept clear of the bulkheads and decks forming these boundaries. No emergency circuit in an engine room or a boiler room may supply equipment in any other space.

(g) The emergency switchboard must be as near as practicable to the emergency power source but not in the same space as a battery emergency power source.

(h) If the emergency power source is a generator, the emergency switchboard must be in the same space as the emergency power source.

(i) The prime mover of an emergency generator must be either a diesel engine or a gas turbine.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28286, June 4, 1996; 62 FR 23910, May 1, 1997]

### Subpart 112.15—Emergency Loads

#### § 112.15-1 Temporary emergency loads.

On vessels required by § 112.05-5(a) to have a temporary emergency power source, the following emergency lighting and power loads must be arranged so that they can be energized from the temporary emergency power source:

(a) Navigation lights.

(b) Enough lights throughout machinery spaces to allow essential operations and observations under emergency conditions and to allow restoration of service.

(c) Lighting, including low location lighting if installed, for passageways, stairways, and escape trunks in passenger quarters, crew quarters, public spaces, machinery spaces, damage control lockers, emergency equipment lockers, and work spaces sufficient to allow passengers and crew to find their way to open decks and to survival craft, muster stations, and embarkation stations with all watertight doors and fire doors closed.

(d) Illuminated signs with the word "EXIT" in red letters throughout a passenger vessel so the direction of escape to the open deck is obvious from any portion of the vessel usually accessible to the passengers or crew, except machinery spaces, and except stores and similar spaces where the crew are not normally employed. There must be sufficient signs so that the direction of escape is obvious, with all fire doors in stairway enclosures and main vertical zone bulkheads closed and all watertight doors closed. For the purpose of this paragraph, an individual stateroom or other similar small room is not required to have a sign, but the direction of escape must be obvious to a person emerging from the room.

(e) Illumination to allow safe operation of each power operated watertight door.

(f) At least one light in each space where a person may be maintaining, repairing, or operating equipment, stowing or drawing stores or equipment, or transiting, such as public spaces, work spaces, machinery spaces, workshops, galleys, emergency fire pump rooms, bow thruster rooms, storage areas for

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paint, rope, and other stores, underdeck passageways in cargo areas, steering gear rooms, windlass rooms, normally accessible duct keels with valve operators, cargo handling rooms, and holds of roll-on/roll-off vessels.

(g) Lighting for survival craft launching, including muster stations, embarkation stations, the survival craft, its launching appliances and the area of the water where it is to be launched.

(h) Electric communication systems that are necessary under temporary emergency conditions and that do not have an independent storage battery source of power.

(i) Each power operated watertight door system.

(j) All shipwide communications systems necessary for the transmittal of information during an emergency.

(k) Each fire door holding and release system.

(l) Supply to motor generator or other conversion equipment if a temporary emergency power source of alternating current is necessary for essential communication systems or emergency equipment.

(m) Each daylight signaling light.

(n) Each smoke detector system.

(o) Each electrically controlled or powered ship's whistle.

(p) Each fire detection system; and gas detection system if installed.

(q) All lighting relative to helicopter operations and landing if installed, unless provided for by another source of power (such as independent batteries separately charged by solar cells).

(r) Each general emergency alarm system required by IMO SOLAS 74 (incorporated by reference; see 46 CFR 110.10-1).

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28286, June 4, 1996; USCG-2003-16630, 73 FR 65201, Oct. 31, 2008]

**§ 112.15-5 Final emergency loads.**

On vessels required to have a final emergency power source by § 112.05-5(a) of this chapter, the following emergency lighting and power loads must be arranged so that they can be energized from the final emergency power source:

(a) Each load under § 112.15-1.

(b) The machinery, controls, and alarms for each passenger elevator.

(c) Each charging panel for:

(1) Temporary emergency batteries;

(2) Starting batteries for diesel engines or gas turbines that drive emergency generators; and

(3) General alarm batteries.

(d) One of the bilge pumps, if the emergency power source is its source of power to meet Part 56 of this chapter.

(e) One of the fire pumps, if the emergency power source is its source of power to meet the requirements of the subchapter under which the vessel is certificated.

(f) Each sprinkler system, water spray extinguishing system, or foam system pump.

(g) If necessary, the lube oil pump for each propulsion turbine and reduction gear, propulsion diesel reduction gear, and ship's service generator turbine which needs external lubrication.

(h) Each rudder angle indicator.

(i) Each radio or global maritime distress and safety system (GMDSS) component.

(j) Each radio direction finder, radar, gyrocompass, depth sounder, global positioning system (GPS), satellite navigation system (SATNAV), speed log, rate-of-turn indicator and propeller pitch indicator.

(k) Each steering gear feeder, if required by part 58, subpart 58.25, of this chapter.

(l) Each general emergency alarm flashing light required by § 113.25-10 of this chapter.

(m) Each electric blow-out-preventer control system.

(n) Any permanently installed diving equipment that is dependent upon the vessel's or drilling unit's power.

(o) Each emergency generator starting compressor, as allowed by § 112.50-7(c)(3)(ii).

(p) Each steering gear failure alarm required by part 113, subpart 113.43, of this chapter.

(q) The ballast control system on each column-stabilized mobile offshore drilling unit.

(r) Each vital system automation load required by part 62 of this chapter.

(s) Motor-operated valves for each cargo oil and fuel oil system, if the emergency power source is the source

of power to meet § 56.60(d) of this chapter.

(t) Each ship's stabilizer wing, unless a separate source of emergency power is supplied.

(u) Each indicator that shows the position of the stabilizer wings, if the emergency power source is its emergency source of power.

(v) Each smoke extraction fan (not including smoke detector sampling) and CO<sub>2</sub> exhaust fan for spaces.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996; 61 FR 36787, July 12, 1996; USCG-2010-0759, 75 FR 60003, Sept. 29, 2010]

**§ 112.15-10 Loads on systems without a temporary emergency power source.**

If there is no temporary emergency power source, the loads under § 112.15-1 must be arranged so that they can be energized from the final emergency power source.

**Subpart 112.20—Emergency Systems Having a Temporary and a Final Emergency Power Source**

**§ 112.20-1 General.**

This subpart contains requirements applicable to emergency power installations having both a temporary and a final emergency power source.

**§ 112.20-3 Normal source for emergency loads.**

(a) The normal source for emergency loads must be the ship's service generating plant.

(b) The power from the ship's service generating plant for the emergency loads must be supplied to the emergency switchboard through automatic transfer switches.

**§ 112.20-5 Failure of power from the normal source or final emergency power source.**

(a) If there is a reduction of potential of the normal source by 15 to 40 percent, the loads under § 112.15-1 must be automatically supplied from the temporary emergency power source.

(b) For systems in which a reduction of frequency of the normal source or final emergency power source ad-

versely affects the emergency system and emergency loads, there must be means to transfer the loads under § 112.15-1 to the temporary emergency power source upon a reduction in the frequency of the normal source or final emergency power source.

**§ 112.20-10 Diesel or gas turbine driven emergency power source.**

Simultaneously with the operation of the transfer means under § 112.20-5, the diesel engine or gas turbine driving the final emergency power source must start automatically with no load on the final emergency power source.

**§ 112.20-15 Transfer of emergency loads.**

(a) When the potential of the final emergency power source reaches 85 to 95 percent of normal value, the emergency loads under § 112.15-5 must transfer automatically to the final emergency power source and, on a passenger vessel, this transfer must be accomplished in no more than 45 seconds after failure of the normal source of power.

(b) When the potential from the normal source has been restored, the emergency loads must be manually or automatically transferred to the normal source, and the final emergency power source must be manually or automatically stopped.

(c) If the potential of the final emergency power source is less than 75 to 85 percent of normal value while supplying the emergency loads, the temporary emergency loads under § 112.15-1 must transfer automatically to the temporary emergency power source.

**Subpart 112.25—Emergency Systems Having an Automatic Starting Diesel Engine or Gas Turbine Driven Emergency Power Source as the Sole Emergency Power Source**

**§ 112.25-1 General.**

This subpart contains requirements applicable to emergency power installations having an automatic starting diesel engine or gas turbine driven emergency power source as the sole emergency power source.

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**§ 112.25-3 Normal source for emergency loads.**

(a) The normal source for emergency loads must be the ship's service generating plant.

(b) The power from the ship's service generating plant for the emergency loads must be supplied to the emergency switchboard by an automatic transfer switch located at the emergency switchboard.

**§ 112.25-5 Failure of power from the normal source.**

If there is a reduction of potential of the normal source by 15 to 40 percent, the diesel engine or gas turbine driving the final emergency power source must start automatically with no load on the emergency power source.

**§ 112.25-10 Transfer of emergency loads.**

(a) When the potential of the final emergency source reaches 85 to 95 percent of normal value, the emergency loads under §112.15-5 must transfer automatically to the final emergency power source and this transfer must be accomplished in no more than 45 seconds after failure of the normal source of power.

(b) When the potential from the normal source has been restored, the emergency loads must be manually or automatically transferred to the normal source, and the final emergency power source must be manually or automatically stopped.

**Subpart 112.30—Emergency Systems Having an Automatically Connected Storage Battery as the Sole Emergency Power Source**

**§ 112.30-1 General.**

This subpart contains requirements applicable to emergency power installations having an automatically connected storage battery as the sole emergency power source.

**§ 112.30-3 Normal source for emergency loads.**

(a) The normal source for emergency loads must be the ship's service generating plant.

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(b) The power from the ship's service generating plant for the emergency loads must be supplied to the emergency loads through automatic transfer switches.

**§ 112.30-5 Transfer of emergency loads.**

If there is a reduction of potential of the normal source by 15 to 40 percent, the emergency loads under §112.15-5 must transfer automatically from the normal source to the emergency power source.

**§ 112.30-10 Restoration of normal source potential.**

When the potential from the normal source is restored to 85 to 95 percent of its normal value, the emergency loads must transfer automatically to the normal source.

**Subpart 112.35—Manually Controlled Emergency Systems Having a Storage Battery or a Diesel Engine or Gas Turbine Driven Generator as the Sole Emergency Power Source**

**§ 112.35-1 General.**

This subpart contains requirements applicable to emergency power installations having a manually controlled storage battery, diesel engine, or gas turbine driven generator as the sole emergency power source.

**§ 112.35-3 Normal source for emergency loads.**

The normal source for emergency loads must be the ship's service generating plant.

**§ 112.35-5 Manually started emergency systems.**

Manually started emergency lighting and power systems must be activated by one manual operation, such as the manual operation of a switch from an "off" to an "on" position, to cause the emergency system to supply its connected loads.

**§ 112.35-7 Activating means.**

The activating means must be in the navigating bridge or in a location

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where the means can be controlled by the chief engineer.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

### Subpart 112.37—Temporary Emergency Power Source

#### § 112.37-1 General.

Each temporary source of emergency power required by Table 112.05-5(a) must consist of a storage battery of sufficient capacity to supply the temporary emergency loads for not less than one-half hour.

### Subpart 112.39—Battery Operated Lanterns

#### § 112.39-1 General.

(a) Each battery-operated, relay-controlled lantern used in accordance with Table 112.05-5(a) must:

- (1) Have rechargeable batteries;
- (2) Have an automatic battery charger that maintains the battery in a fully charged condition; and
- (3) Not be readily portable.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

#### § 112.39-3 Operation.

(a) The lanterns must be capable of providing light for at least 3 hours.

(b) The lantern must be relay-controlled so that the loss of normal power causes the lanterns to light.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

### Subpart 112.40—Alternating-Current Temporary Source of Supply

#### § 112.40-1 General requirements.

Installations requiring alternating current for the operation of communication equipment or other apparatus essential under temporary emergency conditions must be provided with the necessary conversion equipment. If the conversion equipment operates both under normal conditions and under temporary emergency conditions, the

conversion equipment must be provided in duplicate.

### Subpart 112.43—Emergency Lighting Systems

#### § 112.43-1 Switches.

An emergency lighting system must not have a switch, except:

- (a) In a distribution panel;
- (b) As required in § 112.43-7; or
- (c) In a circuit that serves a hazardous space such as a paint room or cargo handling room if the switch is located outside of the hazardous location.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

#### § 112.43-5 Controls on island type vessels.

On an island type vessel, such as a containership, emergency lights for illumination of survival craft launching operations must be controlled from a central location within the island nearest the launching operations or from the navigating bridge.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

#### § 112.43-7 Navigating bridge distribution panel.

(a) Except as allowed in paragraph (b) of this section, the following emergency lights must be supplied from a distribution panel on the navigating bridge:

- (1) Navigation lights not supplied by the navigation light indicator panel.
- (2) Lights for survival craft launching operations under § 111.75-16, except as allowed in § 112.43-5.
- (3) Signaling lights.
- (4) Emergency lights:
  - (i) On open decks;
  - (ii) On the navigating bridge;
  - (iii) In the chartroom;
  - (iv) In the fire control room; and
  - (v) For navigation equipment.

(b) On a mobile offshore drilling unit, the distribution panel required in paragraph (a) of this section must be in the control room.

(c) Each distribution panel required in paragraphs (a) and (b) of this section



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must have a fused switch or circuit breaker for each branch circuit.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

## § 112.43-9 Signaling lights.

Each signaling light must be supplied by a branch circuit that supplies no other equipment.

## § 112.43-11 Illumination for launching operations.

Branch circuits supplying power to lights for survival craft launching operations must supply no other equipment and meet § 111.75-16 of this chapter.

[CGD 94-108, 61 FR 28287, June 4, 1996]

## § 112.43-13 Navigation light indicator panel supply.

Each navigation light indicator panel must be supplied:

- (a) Directly from the emergency switchboard; or
- (b) Be a through feed, without switch or overcurrent protection, from the feeder supply the navigating bridge emergency lighting panel.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

## § 112.43-15 Emergency lighting feeders.

For a vessel with fire bulkheads forming fire zones, at least one emergency lighting feeder must supply only the emergency lights between two adjacent main vertical fire zone bulkheads. The emergency lighting feeder must be separated as widely as practicable from any general lighting feeder supplying the same space.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

## Subpart 112.45—Visible Indicators

### § 112.45-1 Visible indicators.

There must be visible indicators in the machinery space to show:

- (a) When an emergency battery is discharging; and

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- (b) When the automatically controlled emergency power source is supplying the emergency loads.

## Subpart 112.50—Emergency Diesel and Gas Turbine Engine Driven Generator Sets

### § 112.50-1 General.

- (a) The prime mover of a generator set must have:

- (1) All accessories necessary for operation and protection of the prime mover; and

- (2) A self-contained cooling system of a size that ensures continuous operation with 100 degrees F (37 degrees C) air.

- (b) The fuel used must have a flashpoint of not less than 110 degrees F (43 degrees C).

- (c) The room that has the generator set must have intake and exhaust ducts to supply adequate cooling air.

- (d) The generator set must be capable of carrying its full rated load within 45 seconds after cranking is started with the intake air, room ambient temperature, and starting equipment at 0°C. The generator's prime mover must not have a starting aid to meet this requirement, except that a thermostatically-controlled electric water-jacket heater connected to the final emergency bus is permitted.

- (e) The generator set must start by hydraulic, compressed air, or electrical means.

- (f) The generator set must maintain proper lubrication when inclined to the angles specified in § 112.05-5(c), and must be arranged so that it does not spill oil under a vessel roll of 30 degrees to each side of the vertical.

- (g) The generator set must shut down automatically upon loss of lubricating oil pressure, overspeed, or operation of a fixed fire extinguishing system in the emergency generator room (see § 111.12-1(b) for detailed overspeed trip requirements).

- (h) If the prime mover is a diesel engine, there must be an audible alarm that sounds on low oil pressure and high cooling water temperature.

- (i) If the prime mover is a gas turbine, it must meet the shutdown and alarm requirements in § 58.10-15(f) of this chapter.

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(j) An independent fuel supply must be provided for the prime mover.

(k) Each emergency generator that is arranged to be automatically started must be equipped with a starting device with an energy-storage capability of at least six consecutive starts. A second, separate source of starting energy may provide three of the required six starts. If a second source is provided, the system need only provide three consecutive starts.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996; USCG-2004-18884, 69 FR 58348, Sept. 30, 2004]

### § 112.50-3 Hydraulic starting.

A hydraulic starting system must meet the following:

(a) The hydraulic starting system must be a self-contained system that provides the cranking torque and engine starting RPM recommended by the engine manufacturer. The hydraulic starting system must be capable of six consecutive starts, unless a second, separate source of starting energy capable of three consecutive starts is provided. A second, separate source of starting energy may provide three of the required six starts. If a second source is provided, the hydraulic system need only provide three consecutive starts.

(b) The stored hydraulic pressure must be automatically maintained within the predetermined pressure limits.

(c) The means of automatically maintaining the hydraulic system within the predetermined pressure limits must be electrically energized from the final emergency bus.

(d) There must be a means to manually recharge the hydraulic system.

(e) Charging of the hydraulic starting system must not cause insufficient hydraulic pressure for engine starting.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28287, June 4, 1996]

### § 112.50-5 Electric starting.

An electric starting system must have a starting battery with sufficient capacity for at least six consecutive starts. A second, separate source of starting energy may provide three of

the required six starts. If a second source is provided, the electrical starting system need only provide three consecutive starts.

[CGD 94-108, 61 FR 28288, June 4, 1996]

### § 112.50-7 Compressed air starting.

A compressed air starting system must meet the following:

(a) The starting, charging, and energy storing devices must be in the emergency generator room, except for the main or auxiliary air compressors addressed in paragraph (c)(3)(i) of this section.

(b) The compressed air starting system must provide the cranking torque and engine starting RPM recommended by the engine manufacturer.

(c) The compressed air starting system must have an air receiver that meets the following:

(1) Has a capacity for at least six consecutive starts. A second, separate source of starting energy may provide three of the required consecutive starts. If a second source is provided, the compressed air starting system need only provide three consecutive starts.

(2) Supplies no other system.

(3) Is supplied from one of the following:

(i) The main or auxiliary compressed air receivers with a nonreturn valve in the emergency generator room and a handcranked, diesel-powered air compressor for recharging the air receiver.

(ii) An electrically driven air compressor that is automatically operated and is powered from the emergency power source. If this compressor supplies other auxiliaries, there must be a non-return valve at the inlet of the starting air receiver and there must be a handcranked, diesel-powered air compressor for recharging the air receiver.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28288, June 4, 1996]

## Subpart 112.55—Storage Battery Installation

### § 112.55-1 General.

Each storage battery installation must meet Subpart 111.15 of this chapter.

## § 112.55-5

### § 112.55-5 Emergency lighting loads.

When supplying emergency lighting loads, the storage battery initial voltage must not exceed the standard system voltage by more than 5 percent.

### § 112.55-10 Storage battery charging.

(a) Each storage battery installation for emergency lighting and power, and starting batteries for an emergency diesel or gas turbine driven generator set, must have apparatus to automatically maintain the battery fully charged.

(b) When the ship's service generating plant is available, the battery must have a continuous trickle charge, except that after discharge the battery must be charged automatically at a higher rate.

(c) Charging operations must not cause an absence of battery power.

(d) There must be instruments to show the rate of charge.

### § 112.55-15 Capacity of storage batteries.

(a) A storage battery for an emergency lighting and power system must have the capacity—

(1) To close all watertight doors two times;

(2) To open all watertight doors once; and

(3) To carry the remaining emergency loads continuously for the time prescribed in § 112.05-5(a), table 112.05-5(a).

(b) At the end of the time specified in paragraph (a) of this section, the potential of the storage battery must be at least 88 percent of the standard voltage.

[CGD 74-125A, 47 FR 15267, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28288, June 4, 1996; 61 FR 39695, July 30, 1996]

## PART 113—COMMUNICATION AND ALARM SYSTEMS AND EQUIPMENT

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Sec.

- 113.05-5 Approved equipment.
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### Subpart 113.27—Engineers' Assistance-Needed Alarm

- 113.27-1 Engineers' assistance-needed alarm.

### Subpart 113.30—Internal Communications

- 113.30-1 Applicability.
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- 113.35-1 Definitions.
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- 113.35-5 Electric engine order telegraph systems.
- 113.35-7 Electric engine order telegraph systems; operations.
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