this case, there must be a neutral over-
current relay and alarm system that is
set to function at a current value not
more than the neutral rating.

(2) Equalizer buses. For each three-
wire generator, the circuit breaker
must protect against a short circuit on
the equalizer bus.

(j) Circuit breaker reclosing. Generator
circuit breakers must not automati-
cally close after tripping.

§ 111.12–13 Propulsion generator pro-
tection.

For general requirements, see
§ 111.35–1 of this chapter.

Subpart 111.15—Storage Batteries
and Battery Chargers: Con-
stuction and Installation

§ 111.15–1 General.

Each battery must meet the require-
ments of this subpart.


§ 111.15–2 Battery construction.

(a) A battery cell, when inclined at 40
degrees from the vertical, must not
spill electrolyte.

(b) Each fully charged lead-acid bat-
tery must have a specific gravity that
meets section 22 of IEEE 45–2002 (incor-
porated by reference; see 46 CFR 110.10–
1).

(c) Batteries must not evolve hydro-
gen at a rate exceeding that of a simi-
lar size lead-acid battery under similar
charging condition.

(d) Batteries must be constructed to
take into account the environmental
conditions of a marine installation, in-
cluding temperature, vibration, and
shock.

[CGD 94–108, 61 FR 28277, June 4, 1996, as
amended by USCG–2003–16630, 73 FR 63106,
Oct. 31, 2008]

§ 111.15–3 Battery categories.

(a) A battery installation is classified
as one of three types, based upon power
output of the battery charger, as fol-

§ 111.15–5

(b) Batteries that generate less hy-
drogen under normal charging and dis-
charging conditions than an equivalent
category of lead-acid batteries (e.g.,
sealed batteries) may have their bat-
tery category reduced to an equivalent
category of lead-acid batteries.

[CGD 74–125A, 47 FR 15236, Apr. 8, 1982, as
amended by CGD 94–108, 61 FR 28278, June 4,
1996]

§ 111.15–5 Battery installation.

(a) Large batteries. A large battery installation
is one connected to a battery charger
that has an output of more than 2 kw
computed from the highest possible
charging current and the rated voltage
of the battery installation.

(b) Moderate batteries. A moderate battery insta-
llation is one connected to a battery charger
that has an output of between 0.2 kw and 2 kw
computed from the highest possible charging current and
the rated voltage of the battery installation.

(c) Small batteries. Small size battery installa-
tions must not be located in poorly-ventilated spaces, such as
closets, or in living spaces, such as state-
rooms.

(d) Battery trays. Each battery tray
must be chocked with wood strips or
§ 111.15–10 Ventilation.

(a) General. Each room, locker, and box for storage batteries must be arranged or ventilated to prevent accumulation of flammable gas.

(b) Power ventilation. If power ventilation is required, the following must be met:

(1) The power ventilation system must be separate from ventilation systems for other spaces.

(2) Electric motors must be outside the duct and compartment and:

(i) Have an explosion-proof motor for a Class I, Division 1, Group B location; or

(ii) Be at least 10 ft. (3 m) from the exhaust end of the duct.

(3) Each blower must have a non-sparking fan.

(4) The power ventilation system must be interlocked with the battery charger so that the battery cannot be charged without ventilation.

(c) Large battery installations. Each battery room for large battery installations must have a power exhaust ventilation system and have openings for intake air near the floor that allow the passage of the quantity of air that must be expelled. The quantity of the air expelled must be at least:

\[ q = 3.89(i)(n) \]

where:

- \( q \) = quantity of expelled air in cubic feet per hour.
- \( i \) = maximum charging current during gas formation, or one-fourth of the maximum obtainable charging current of the charging facility, whichever is greater.
- \( n \) = number of cells.

(d) Moderate and small battery installations. Each battery room or battery locker for moderate or small battery installations must have louver near the bottom of the room or locker for air, and must be ventilated by:

(1) Ventilation that meets paragraph (c) of this section;

(2) An exhaust duct:

(i) That extends from the top of the room or locker to at least 3 ft. (1 m) above the top of the room or locker;

(ii) That extends from the top of the room or locker to at least 3 ft. (1 m) above the top of the room or locker;

(iii) That is at an angle of 45 degrees or less from the vertical; and

(iv) That has no appliances, such as flame arresters, that impede free passage of air or gas mixtures; or

(3) A duct from the top of the room or locker to an exhaust ventilation duct.

(e) Deck boxes. Except for a deck box for a small battery installation, each deck box must have a duct from the top of the box to at least 4 ft. (1.2 m) above the box ending in a gooseneck or mushroom head that prevents entrance of water. Holes for air must be at least two parallel sides of each box.

(f) Weatherproof. Each deck box must be weatherproof.

(g) Boxes for small battery installations. Each box for a small battery installation must have openings near the top...