§ 28.350 General requirements for electrical systems.

(a) Electrical equipment exposed to the weather or in a location exposed to seas must be waterproof, watertight, or enclosed in a watertight housing.

(b) Aluminum must not be used for current carrying parts of electrical equipment or wiring.

(c) As far as practicable, electrical equipment must not be installed in lockers used to store paint, oil, turpentine, or other flammable or combustible liquid. If electrical equipment, such as lighting, is necessary in these spaces, it must be explosion-proof or intrinsically safe.

(d) Explosion-proof and intrinsically safe equipment must meet the requirements of 46 CFR part 111, subpart 111.105.

(e) Metallic enclosures and frames of electrical equipment must be grounded.

(f) Each vessel with a nonmetallic hull must have a continuous, non-current carrying grounding conductor which connects together the enclosures and frames of electrical equipment and which connects metallic items such as engines, fuel tanks, and equipment enclosures to a common ground point.

(g) The equipment grounding conductor must be sized in accordance with section 250–95 of NFPA Standard 70.

§ 28.355 Main source of electrical power.

(a) Applicability. Each vessel that relies on electricity to power any of the following essential loads must have at least two electrical generators to supply these loads:

1. The propulsion system and its necessary auxiliaries and controls;
2. Interior lighting;
3. Steering systems;
4. Communication systems;
5. Navigation equipment and navigation lights;
6. Fire protection or detection equipment;
7. Bilge pumps; or
8. General alarm system.

(b) Each generator must be attached to an independent prime mover.

§ 28.360 Electrical distribution systems.

(a) Each electrical distribution system which has a neutral bus or conductor must have the neutral bus or conductor grounded.

(b) A grounded electrical distribution system must have only one connection to ground. This ground connection must be at the switchboard or, on a nonmetallic vessel, at the common ground point.

§ 28.365 Overcurrent protection and switched circuits.

(a) Each power source must be protected against overcurrent. Overcurrent devices for generators must be set at a value not exceeding 115 percent of the generator full load rating.

(b) Except for a steering circuit, each circuit must be protected against both overload and short circuit. Each overcurrent device in a steering system power and control circuit must provide short circuit protection only.

(c) Each ungrounded current carrying conductor must be protected in accordance with its current carrying capacity by a circuit breaker or fuse at the connection to the switchboard or distribution panel bus.

(d) Each circuit breaker and each switch must simultaneously open all ungrounded conductors.

(e) The grounded conductor of a circuit must not be disconnected by a switch or an overcurrent device unless all ungrounded conductors of the circuit are simultaneously disconnected.

(f) Navigation light circuits must be separate, switched circuits having fused disconnect switches or circuit breakers so that only the appropriate navigation lights can be switched on.

(g) A separate circuit with overcurrent protection at the main distribution panel or switchboard must be provided for each radio installation.

§ 28.370 Wiring methods and materials.

(a) All cable and wire must have insulated, stranded copper conductors of the appropriate size and voltage rating for the circuit.

(b) Each conductor must be No. 22 AWG or larger. Conductors in power and lighting circuits must be No. 14 AWG or larger. Conductors must be
§ 28.375 Emergency source of electrical power.

(a) Each vessel must have an emergency source of electrical power which is independent of the main sources of electrical power and which is located outside the main machinery space.

(b) The emergency source of electrical power must be capable of supplying all connected loads continuously for at least 3 hours.

(c) Except as provided in paragraphs (d) and (e) of this section, the following electrical loads must be connected to the emergency source of power:

(1) Navigation lights;
(2) Steering systems;
(3) Bilge pumps;
(4) Fire protection and detection systems, including fire pumps;
(5) Communication equipment;
(6) General alarm system and;
(7) Emergency lighting.

(d) A vessel less than 36 feet (11.0 meters) in length need only supply communication equipment by an emergency source of electrical power if flashlights are provided.

(e) A vessel less than 79 feet (24 meters) in length which is not dependent upon electrical power for propulsion, including propulsion control systems or steering, need only supply emergency lighting, navigation equipment, general alarm system, and communication systems by the emergency source of power.

(f) Where the emergency source of power is a generator, the generator prime mover must have a fuel supply which is independent of other prime movers.


§ 28.380 General structural fire protection.

(a) Fire hazards to be minimized. Each vessel must be constructed so as to minimize fire hazards insofar as is reasonable and practicable.

(b) Combustibles insulated from heated surfaces. An internal combustion engine exhaust, galley uptake, electrical heating tape, or similar source of ignition must be kept clear of and suitably insulated from combustible material. A dry exhaust system for an internal combustion engine on a wooden or fiber reinforced plastic vessel must be installed in accordance with ABYC F-1.

(c) Separation of machinery and fuel tank spaces from accommodation spaces.

(1) Each accommodation space must be separated from machinery and fuel tank spaces by a fire resistant boundary which will prevent the passage of vapors.

(2) Each pipe and cable penetration between an accommodation space and a machinery or a fuel tank storage space must be sealed.

(d) Paint and flammable liquid lockers. Each vessel carrying paint and flammable liquids must be equipped with a steel or a steel lined storage locker.