

(1) The purpose of the cable is to supply equipment or instruments especially designed for and compatible with service in the tank and whose function requires the installation of the cable in the tank;

(2) The cable is either compatible with the liquid or gas in the tank or protected by an enclosure; and

(3) Neither braided cable armor nor cable metallic sheath is used as the grounding conductor.

(d) Braided cable armor or cable metallic sheath must not be used as the grounding conductor.

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28280, June 4, 1996; USCG-2003-16630, 73 FR 65198, Oct. 31, 2008]

**§ 111.60-6 Fiber optic cable.**

Each fiber optic cable must—

(a) Be constructed to pass the flammability test contained in IEEE 1202, test VW-1 of UL 1581, or Category A of IEC 60332-3-22 (all three standards incorporated by reference; see 46 CFR 110.10-1); or

(b) Be installed in accordance with § 111.60-2.

[CGD 94-108, 61 FR 28280, June 4, 1996, as amended by USCG-2003-16630, 73 FR 65198, Oct. 31, 2008]

**§ 111.60-7 Demand loads.**

Generator, feeder, and bus-tie cables must be selected on the basis of a computed load of not less than the demand load given in Table 111.60-7.

TABLE 111.60-7—DEMAND LOADS

Type of circuit	Demand load
Generator cables .....	115 percent of continuous generator rating.
Switchboard bus-tie, except ship's service to emergency switchboard bus-tie.	75 percent of generating capacity of the larger switchboard.
Emergency switchboard bus-tie .....	115 percent of continuous rating of emergency generator.
Motor feeders .....	Article 430, NFPA NEC 2002 (incorporated by reference; see 46 CFR 110.10-1).
Galley equipment feeder .....	100 percent of either the first 50 KW or one-half the connected load, whichever is the larger, plus 65 percent of the remaining connected load, plus 50 percent of the rating of the spare switches or circuit breakers on the distribution panel.
Lighting feeder .....	100 percent of the connected load plus the average active circuit load for the spare switches or circuit breakers on the distribution panels.
Grounded neutral of a dual voltage feeder .....	100 percent of the capacity of the ungrounded conductors when grounded neutral is not protected by a circuit breaker overcurrent trip, or not less than 50 percent of the capacity of the ungrounded conductors when the grounded neutral is protected by a circuit breaker overcurrent trip or overcurrent alarm.

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by USCG-2004-18884, 69 FR 58348, Sept. 30, 2004; USCG-2003-16630, 73 FR 65198, Oct. 31, 2008]

**§ 111.60-9 Segregation of vital circuits.**

(a) *General.* A branch circuit that supplies equipment vital to the propulsion, control, or safety of the vessel must not supply any other equipment.

(b) *Passenger vessels.* (1) Each passenger vessel with firescreen bulkheads that form main fire zones must have distribution systems arranged so that fire in a main fire zone does not inter-

fere with essential services in another main fire zone.

(2) Main and emergency feeders passing through a main fire zone must be separated vertically and horizontally as much as practicable.

**§ 111.60-11 Wire.**

(a) Wire must be in an enclosure.

(b) Wire must be component insulated.

(c) Wire, other than in switchboards, must meet the requirements in sections 24.6.7 and 24.8 of IEEE 45-2002, NPFC MIL-W-76D, UL 44, UL 83 (all

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four standards incorporated by reference; see 46 CFR 110.10-1), or equivalent standard.

(d) Switchboard wire must meet subpart 111.30 of this part.

(e) Wire must be of the copper stranded type.

[CGD 94-108, 61 FR 28281, June 4, 1996, as amended at 62 FR 23908, May 1, 1997; 62 FR 27659, May 20, 1997; USCG-2003-16630, 73 FR 65198, Oct. 31, 2008]

### § 111.60-13 Flexible electric cord and cables.

(a) *Construction and testing.* Each flexible cord and cable must meet the requirements in section 24.6.1 of IEEE 45-2002, Article 400 of NFPA NEC 2002, NEMA WC-3, NEMA WC-70, or UL 62 (all five standards incorporated by reference; see 46 CFR 110.10-1).

(b) *Application.* No flexible cord may be used except:

(1) As allowed under Sections 400-7 and 400-8 of NFPA NEC 2002; and

(2) In accordance with Table 400-4 in NFPA NEC 2002.

(c) *Allowable current-carrying capacity.* No flexible cord may carry more current than allowed under Table 400-5 in NFPA NEC 2002, NEMA WC-3, or NEMA WC-70.

(d) *Conductor size.* Each flexible cord must be No. 18 AWG (0.82 mm<sup>2</sup>) or larger.

(e) *Splices.* Each flexible cord and cable must be without splices or taps except for a cord or cable No. 12 AWG (3.3 mm<sup>2</sup>) or larger spliced for repairs in accordance with § 111.60-19.

(f) *Pull at joints and terminals.* Each flexible cord and cable must be connected to a device or fitting by a knot, tape, or special fitting so that tension is not transmitted to joints or terminal screws.

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28281, June 4, 1996; USCG-2003-16630, 73 FR 65198, Oct. 31, 2008]

### § 111.60-17 Connections and terminations.

(a) In general, connections and terminations to all conductors must retain the original electrical, mechanical, flame-retarding, and, where necessary, fire-resisting properties of the cable.

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All connecting devices must be suitable for copper stranded conductors.

(b) If twist-on type of connectors are used, the connections must be made within an enclosure and the insulated cap of the connector must be secured to prevent loosening due to vibration.

(c) Twist-on type of connectors may not be used for making joints in cables, facilitating a conductor splice, or extending the length of a circuit.

[CGD 94-108, 61 FR 28281, June 4, 1996]

### § 111.60-19 Cable splices.

(a) A cable must not be spliced in a hazardous location, except in intrinsically safe systems.

(b) Each cable splice must be made in accordance with section 25.11 of IEEE 45-2002 (incorporated by reference; see 46 CFR 110.10-1).

[CGD 94-108, 61 FR 28281, June 4, 1996, as amended by USCG-2003-16630, 73 FR 65198, Oct 31, 2008]

### § 111.60-21 Cable insulation tests.

All cable for electric power and lighting and associated equipment must be checked for proper insulation resistance to ground and between conductors. The insulation resistance must not be less than that in section 34.2.1 of IEEE 45-2002 (incorporated by reference; see 46 CFR 110.10-1).

[USCG-2003-16630, 73 FR 65199, Oct. 31, 2008]

### § 111.60-23 Metal-clad (Type MC) cable.

(a) Metal-clad (Type MC) cable permitted on board a vessel must be continuous corrugated metal-clad cable.

(b) The cable must have a corrugated gas-tight, vapor-tight, and watertight sheath of aluminum or other suitable metal that is close-fitting around the conductors and fillers and that has an overall jacket of an impervious PVC or thermoset material.

(c) The cable is not allowed in areas or applications exposed to high vibration, festooning, repeated flexing, excessive movement, or twisting, such as in engine rooms, on elevators, or in the area of drill floors, draw works, shakers, and mud pits.

(d) The cable must be installed in accordance with Article 326 of NFPA NEC 2002 (incorporated by reference; see 46