

## SUBCHAPTER J—ELECTRICAL ENGINEERING

### PART 110—GENERAL PROVISIONS

#### Subpart 110.01—Applicability

- Sec.  
 110.01-1 General.  
 110.01-2 OMB control numbers assigned pursuant to the Paperwork Reduction Act.  
 110.01-3 Repairs and alterations.  
 110.01-4 Right of appeal.

#### Subpart 110.10—Reference Specifications, Standards, and Codes

- 110.10-1 Incorporation by reference.

#### Subpart 110.15—Terms Used in This Subchapter

- 110.15-1 Definitions.

#### Subpart 110.20—Equivalents

- 110.20-1 Equivalents.

#### Subpart 110.25—Plan Submittal

- 110.25-1 Plans and information required for new construction.  
 110.25-3 Procedure for submitting plans.

#### Subpart 110.30—Testing and Inspection

- 110.30-1 General.  
 110.30-3 Initial inspection.  
 110.30-5 Inspection for certification.  
 110.30-7 Repairs or alterations.

AUTHORITY: 33 U.S.C. 1509; 43 U.S.C. 1333; 46 U.S.C. 3306, 3307, 3703; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; Department of Homeland Security Delegation No. 0170.1; §110.01-2 also issued under 44 U.S.C. 3507.

SOURCE: CGD 74-125A, 47 FR 15232, Apr. 8, 1982, unless otherwise noted.

#### Subpart 110.01—Applicability

##### § 110.01-1 General.

(a) This subchapter applies to all electrical installations on vessels subject to subchapters D, H, I, I-A, K, L, O, Q, R, T, U, and W of this chapter whenever those subchapters require an electrical installation to be in accordance with this subchapter.

(b) This subchapter applies only to electrical installations contracted for after September 30, 1996.

(c) Installations and equipment accepted by the Coast Guard as meeting

the applicable requirements in this subchapter in effect on the date the installation was contracted for and which are maintained in good and serviceable condition to the satisfaction of the Officer in Charge, Marine Inspection, may be continued in use until replacement is ordered by the Officer in Charge, Marine Inspection, or as specified in the regulations.

(d) [Reserved]

(e) Electrical systems internal to a pressure vessel for human occupancy (PVHO) need not meet the requirements of this subchapter, but must meet the requirements of Subpart B (Commercial Diving Operations) of part 197 of this chapter.

[CGD 74-125A, 47 FR 15232, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28271, June 4, 1996]

##### § 110.01-2 OMB control numbers assigned pursuant to the Paperwork Reduction Act.

(a) *Purpose.* This section collects and displays the control numbers assigned to information collection and record-keeping requirements in this subchapter by the Office of Management and Budget (OMB) pursuant to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). The Coast Guard intends that this section comply with the requirements of 44 U.S.C. 3507(f) which requires that agencies display a current control number assigned by the Director of the OMB for each approved agency information collection requirement.

(b) *Display.*

46 CFR part or section where identified or described	Current OMB control No.
Subpart 110.25 .....	1625-0031

[49 FR 38121, Sept. 27, 1984, as amended by USCG-2004-18884, 69 FR 58348, Sept. 30, 2004]

##### § 110.01-3 Repairs and alterations.

(a) Repairs and replacements in kind must comply with either the regulations in this subchapter or those in effect when the vessel was built.

(b) Alterations and modifications, such as re-engining, re-powering, upgrading of the main propulsion control system, or replacing extensive amounts of cabling, must comply with the regulations in this subchapter.

(c) Conversions specified in 46 U.S.C. 2101(14a), such as the addition of a midbody or a change in the service of the vessel, are handled on a case-by-case basis by the Commanding Officer, Marine Safety Center.

[CGD 94-108, 61 FR 28271, June 4, 1996, as amended at 62 FR 23906, May 1, 1997]

#### § 110.01-4 Right of appeal.

Any person directly affected by a decision or action taken under this subchapter, by or on behalf of the Coast Guard, may appeal therefrom in accordance with subpart 1.03 of this chapter.

[CGD 88-033, 54 FR 50380, Dec. 6, 1989]

### Subpart 110.10—Reference Specifications, Standards, and Codes

#### § 110.10-1 Incorporation by reference.

(a) Certain material is incorporated by reference into this subchapter with

*American Bureau of Shipping (ABS)* American Bureau of Shipping, ABS Plaza, 16855 Northchase Drive, Houston, TX 77060:

Rules for Building and Classing Steel Vessels, 1996 .....	110.15-1; 111.01-9; 111.12-1(a); 111.12-3; 111.12-5; 111.12-7; 111.33-11; 111.35-1; 111.70-1(a); 111.105-31(n); 111.105-39(a); 111.105-40(a); 113.05-7.
Rules for Building and Classing Mobile Offshore Drilling Units, 1994.	111.12-1(a); 111.12-3; 111.12-5; 111.12-7; 111.33-11; 111.35-1; 111.70-1(a).

*American National Standards Institute (ANSI)*, American National Standards Institute, 11 West 42nd Street, New York, NY 10036:

ANSI/ASME A17.1, Safety Code for Elevators and Escalators, 1993.	111.91-1
ANSI/ASME A17.1A, Addenda to ANSI/ASME A17.1, Safety Code for Elevators and Escalators (including Errata, 1995), 1994.	111.91-1.
ANSI/IEEE C37.04, Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis, 1979.	111.54-1(c).
ANSI C37.12, For AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis—Specification Guide, 1991.	111.54-1(c).

*American Society for Testing and Materials (ASTM)*, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959:

ASTM B 117-97, Standard Practice for Operating Salt Spray (Fog) Apparatus.	110.15-1.
--	-----------

the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in paragraph (b) of this section, the Coast Guard must publish notice of change in the FEDERAL REGISTER; and the material must be available to the public. All approved material is available for inspection at the U.S. Coast Guard, (G-MSE), 2100 Second Street SW., Washington, DC 20593-0001, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html). All material is available from the sources indicated in paragraph (b) of this section.

(b) The material approved for incorporation by reference in this subchapter and the sections affected are as follows:

§ 110.10-1

46 CFR Ch. I (10-1-06 Edition)

ASTM D 4066-96a, Standard Classification System for Nylon Injection and Extrusion Materials (PA).	111.60-1.
<i>Institute of Electrical and Electronic Engineers (IEEE)</i> , IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854:	
IEEE Std C37.13, IEEE Standard for Low-Voltage AC Power Circuit Breakers used in Enclosures, 1990.	111.54-1(c).
IEEE Std C37.14, IEEE Standard for Low-Voltage DC Power Circuit Breakers Used in Enclosures, 1992.	111.54-1(c).
IEEE Std 45-1983, IEEE Recommended Practice for Electric Installations on Shipboard, 1983.	111.05-7; 111.15-2(b); 111.30-1; 111.30-5(a); 111.30-19(a); 111.33-3(a); 111.33-5(a); 111.40-1; 111.60-1(a); 111.60-2; 111.60-3; 111.60-5(a); 111.60-6(a); 111.60-11(c); 111.60-13(a); 111.60-19(b); 111.60-21; 111.60-23(d); 111.75-5(b); 111.105-3; 111.105-31(e); 111.105-41; 111.107-1(c); 113-65-5.
IEEE Std 100-1992, The New IEEE Standard Dictionary of Electrical and Electronics Terms, 1992.	110.15-1(a).
IEEE Std 320, Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis (ANSI/IEEE C37.010-79), 1979.	111.54-1(c).
IEEE Std 331, Application Guide for Low-Voltage AC Nonintegrally Fused Power Circuit Breakers (Using Separately Mounted Current-Limiting Fuses) (ANSI/IEEE C37.27), 1987.	111.54-1(c).
IEEE Std 1202-1991, IEEE Standard for Flame Testing of Cables for Use in Cable Tray in Industrial and Commercial Occupancies, 1991.	111.60-2; 111.60-6(a); 111.107-1(c).
<i>International Association of Drilling Contractors (IADC)</i> , International Association of Drilling Contractors, PO Box 4287, Houston, TX 77210-4287:	
IADC-DCCS-1/1991, Guidelines for Industrial System DC Cable for Mobile Offshore Drilling Units, 1991.	111.60-1(f).
<i>International Electrotechnical Commission (IEC)</i> 3, rue de Varembe, Geneva, Switzerland. (Also available from ANSI—address above.)	
IEC 56, High-Voltage Alternating-Current Circuit-Breakers, 1987, (Including Amendment 1, 1992, Amendment 2, 1995, and Amendment 3, 1996).	111.54-1.
IEC 68-2-52, Basic Environmental Testing Procedures, Part 2: Tests. Test KB: Salt Mist, Cyclic (Sodium Chloride Solution), 1984.	110.15-1(b).
IEC 79-0, Electrical Apparatus for Explosive Gas Atmospheres, Part 0: General Requirements, 1983 (Including Amendment 2, 1991).	111.105-1; 111.105-3; 111.105-5; 111.105-7; 111.105-15(b); 111.105-17(b).
IEC 79-1, Electrical Apparatus for Explosive Gas Atmospheres, Part 1: Construction and Test of Flameproof Enclosures of Electrical Apparatus, 1990 [Including the First Supplement to the Second Edition (1971), 1975, and Amendment 1 to the Third Edition (1990), 1993].	111.105-3; 111.105-5; 111.105-9; 111.105-15(b); 111.105-17(b).
IEC 79-2, Electrical Apparatus for Explosive Gas Atmospheres, Part 2: Electrical Apparatus—Type of Protection “p”, 1983.	111.105-3; 111.105-5; 111.105-7(b); 111.105-15(b); 111.105-17(b).
IEC 79-5, Electrical Apparatus for Explosive Gas Atmospheres, Part 5: Sand-Filled Apparatus. First Edition (1967), Incorporating the First Supplement, (1969).	111.105-3; 111.105-5; 111.105-15(a); 111.105-15(b); 111.105-17(b).
IEC 79-6, Electrical Apparatus for Explosive Gas Atmospheres, Part 6: Oil-Immersion “o”, 1995.	111.105-3; 111.105-5; 111.105-15(a); 111.105-15(b); 111.105-17(b).
IEC 79-7, Electrical Apparatus for Explosive Gas Atmospheres, Part 7: Increased Safety “e”, 1990 (Including Amendment 1, 1991, and Amendment 2 1993).	111.105-3; 111.105-5; 111.105-15(a); 111.105-15(b); 111.105-17(b).

## Coast Guard, DHS

## § 110.10-1

IEC 79-11, Electrical Apparatus for Explosive Gas Atmospheres, Part 11: Intrinsic Safety "i", 1991.	Gas	111.105-3; 111.105-5; 111.105-11(a); 111.105-15(b); 111.105-17(b).
IEC 79-15, Electrical Apparatus for Explosive Gas Atmospheres, Part 15: Electrical Apparatus with Type of Protection "n", 1987.	Gas	111.105-3; 111.105-5; 111.105-15(a); 111.105-5(b); 111.105-17(b).
IEC 79-18, Electrical Apparatus for Explosive Gas Atmospheres, Part 18: Encapsulation "m", 1992.	Gas	111.105-3; 111.105-5; 111.105-15(a); 111.105-15(b); 111.105-17(b).
IEC 92-3, Electrical Installation in Ships, Part 3: Cables (construction, testing and installations) Second Edition, 1965, as amended through August, 1982.		111.05-7; 111.60-1(a); 111.60-3(a); 111.60-3(c); 111.81-1(d).
IEC 92-101, Electrical Installations in Ships, Part 101: Definitions and General Requirements, 1994 (Including Amendment 1, 1995).		110.15-1(a); 111.81-1(d).
IEC 92-201, Electrical Installations in Ships, Part 201: System Design—General 1994.		111.70-3(a); 111.81-1(d).
IEC 92-202, Electrical Installations in Ships, Part 202: System Design—Protection, 1994.		111.50-3(c); 111.50-3(e); 111.50-3(g); 111.53-1(a); 111.54-1(a); 111.81-1(d).
IEC 92-301, Electrical Installations in Ships, Part 301: Equipment—Generators and Motors, 1980 (Including Amendment 1, 1994, and Amendment 2, 1995).		111.25-5(a); 111.70-1(a); 111.81-1(d).
IEC 92-302, Electrical Installations in Ships, Part 302: Equipment—Switchgear and Controlgear Assemblies, 1980 (Including Amendment 1, 1989, and Amendment 2, 1994).		111.30-1; 111.30-5(a); 111.30-19(a); 111.81-1(d).
IEC 92-303, Electrical Installations in Ships, Part 303: Equipment—Transformers for Power and Lighting, 1980.		111.20-15; 111.81-1(d).
IEC 92-304, Electrical Installations in Ships, Part 304: Equipment—Semiconductor Converters, 1980 (Including Amendment 1, 1995).		111.33-3(a); 111.33-5(b); 111.81-1(d).
IEC 92-306, Electrical Installations in Ships, Part 306: Equipment—Luminaires and Accessories, 1980.		111.75-20(a); 111.81-1(d).
IEC 92-350, Electrical Installations in Ships, Part 350: Low-Voltage Shipboard Power Cables—General Construction and Test Requirements, 1988, Amendment 1 (1994).		111.60-1.
IEC 92-352, Electrical Installations in Ships, Part 352: Choice and Installation of Cables for Low-Voltage Power Systems, 1979, (Including Amendment 1, 1987, and Amendment 2, 1994).		111.60-3(a); 111.60-3(c); 111.60-5; 111.81-1(d).
IEC 92-353, Electrical Installations in Ships, Part 353: Single and Multicore Non-radial Field Power Cables with Extruded Solid Insulation for Rated Voltages 1 kV and 3 kV, Second edition, 1995-01.		111.60-1, 111.60-3.
IEC 92-401, Electrical Installations in Ships, Part 401: Installation and Test of Completed Installation, 1987.		111.05-9.
IEC 92-501, Electrical Installations in Ships, Part 501: Special Features—Electric Propulsion Plant, 1984.		111.81-1(d).
IEC 92-502, Electrical Installations in Ships, Part 502: Tankers—Special Features, 1994.		111.81-1(d); 111.105-31(e).
IEC 92-503, Electrical Installations in Ships, Part 503: Special Features—A.C. Supply systems with Voltages in the Range Above 1KV up to and including 11KV, 1975.		111.30-5(a); 111.81-1(d).
IEC 92-504, Electrical Installations in Ships, Part 504: Special Features—Control and Instrumentation, 1994.		111.81-1(d).
IEC 331, Fire resisting characteristics of electric cables, 1970.		113.30-25(i).
IEC 332-1, Tests on Electric Cables Under Fire Conditions, Part 1: Test on a Single Vertical Insulated Wire or Cable, 1993.		111.30-19(b).
IEC 332-3, Tests on Electric Cables Under Fire Conditions, Part 3: Test on bunched wires or cables, 1992.		111.60-1(b); 111.60-2; 111.60-6(a); 111.107-1(c).

§ 110.10-1

46 CFR Ch. I (10-1-06 Edition)

- IEC 363, Short-Circuit Current Evaluation with Special Regard to Rated Short-Circuit Capacity of Circuit-Breakers in Installations in Ships, 1972. 111.52-5(c).
- IEC 529, Degrees of protection provided by enclosures (IP Code) 1989. 111.01-9(a); 111.01-9(b); 111.01-9(c); 111.01-9(d); 111.01-9 (Note); 113.10-7; 113.20-3; 113.25-11; 113.30-25(c); 113.30-25(h); 113.40-10(b).
- IEC 533, Electromagnetic Compatibility of Electrical and Electronic Installations in Ships, 1977. 113.05-7.
- IEC 947-2, Low-Voltage Switchgear and Controlgear, Part 2: Circuit Breakers, 1989 (Including Amendment 1, 1992 and Amendment 2, 1993). 111.54-1(b).
- IEC IP Code, see IEC 529.
- International Maritime Organization (IMO)*, International Maritime Organization, Publications Section, 4 Albert Embankment, London SE1 7SR, United Kingdom:
  - International Convention for the Safety of Life at Sea, 1974 (SOLAS 74) Consolidated Edition, (Including 1992 Amendments to SOLAS 74, and 1994 Amendments to SOLAS 74), 1992. 111.99-5; 111.105-31(n); 112.15-1(r); 113.25-6.
- The International Society for Measurement and Control (ISA)*, International Society for Measurement and Control, 67 Alexander Drive. P.O. Box 12277 Research Triangle Park, NC 27709:
  - RP 12.6, Wiring Practices for Hazardous (Classified) Locations Instrumentation Part I: Intrinsic Safety, 1995. 111.105-11(e).
- National Electrical Manufacturers Association (NEMA)*, National Electrical Manufacturers Association, 2101 L Street, NW, Washington, DC 20036:
  - NEMA Standards Publication No. ICS 2, Industrial Control and Systems Controllers, Contractors, and Overload Relays Rated not more than 2000 Volts AC or 750 Volts DC, 1993. 111.70-3(a).
  - NEMA Standards Publication No. 2.3 1983, Instructions for the Handling, Installation, Operation, and Maintenance of Motor Control Centers, 1983. 111.70-3(a).
  - NEMA Standards Publication No. 2.4, NEMA and IEC Devices for Motor Service—A Guide for Understanding the Differences, 1989. 111.70-3(a).
  - NEMA Standards Publication No. 250, Enclosures for Electrical Equipment (1000 Volts Maximum), 1991. 111.01-9(a); 111.01-9(b); 111.01-9(c); 111.01-9(d); 111.01-9 (Note); 111.10-7; 113.20-3; 113.25-11; 113.30-25(c); 113.30-25(h); 113.40-10(b).
  - NEMA Standards Publication No. WC-3, Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy, 1980 (with revisions through May 1989). 111.60-13(a); 111.60-13(c).
  - NEMA Standards Publication No. WC-8, Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy, 1988 (with revisions through 1992). 111.60-13(a); 111.60-13(c).
- National Fire Protection Association (NFPA)*, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269:
  - NEC, see NFPA 70.

**Coast Guard, DHS**

**§ 110.10-1**

NFPA 70, National Electrical Code (NEC), 1996 .....	111.05-33; 111.20-15; 111.25-5(a); 111.50-3(c); 111.50-7; 111.50-9; 111.53-1(a); 111.54-1(a); 111.55-1(a); 111.59-1; Table 111.60-7; 111.60-13(a); 111.60- 13(b); 111.60-13(c); 111.60-23; 111.81-1(d); 111.105-1; 111.105- 1 (Note); 111.105-3; 111.105-5; 111.105-7; 111.105-9; 111.105- 15(a); 111.105-17(b); 111.107- 1(b).
NFPA 77, Recommended Practice on Static Electricity, 1993.	111.105-27.
NFPA 99, Standard for Health Care Facilities, 1996 .....	111.105-37.
NFPA 496, Standard for Purged and Pressurized Enclo- sures for Electrical Equipment, 1993.	111.105-7(b).
<i>Naval Publications and Forms Center (NPFC), Naval Publica- tions and Forms Center, Customer Service—Code 1052, 5801 Tabor Avenue Philadelphia, PA 19120:</i>	
MIL-W-76D, Military Specification Wire and Cable, Hook- up, Electrical, Insulated, General Specification For, 1992.	111.60-11(c).
MIL-W-16878F, Military Specification, Wire, Electrical, Insulated, General Specification For, 1992.	111.60-11(c).
MIL-C-24640A, Military Specification Cables, Light Weight, Electric, Low Smoke, For Shipboard Use, Gen- eral Specification For, 1995.	111.60-1(a); 111.60-3(c).
MIL-C-24643A, Military Specification Cables and Cords, Electric, Low Smoke, For Shipboard Use, General Specification For, 1994 (Including Amendment 1).	111.60-1(a); 111.60-3(c).
<i>Naval Sea Systems Command (NAVSEA), Naval Sea Systems Command, Code 55Z, Department of Navy Washington, DC 20362:</i>	
DDS 300-2, A. C. Fault Current Calculations, 1988 .....	111.52-5.
MIL-HDBK-299 (SH), Military Handbook Cable Compari- son Handbook Data Pertaining to Electric Shipboard Cable, 1989.	111.60-3(c).
<i>NEC, see NFPA 70.</i>	
<i>Underwriters Laboratories, Inc. (UL) 12 Laboratory Drive, Re- search Triangle Park, NC 27709-3995.</i>	
UL 44, Standard for Rubber-Insulated Wire and Cable, 1991 (including revisions through February, 1996).	111.60-11(c).
UL 50, Standard for Enclosures for Electrical Equipment, 1995.	111.81-1(d).
UL 62, Standard for Flexible Cord and Fixture Wire, 1991 (including revisions through February, 1996).	111.60-13(a).
UL 83, Standard for Thermoplastic-Insulated Wires and Cables, 1991 (including revisions through March, 1996).	111.60-1(c); 111.60-11(c).
UL 489, Standard for Molded-Case Circuit Breakers and Circuit-Breaker Enclosures, 1991 (including revisions through June, 1995).	111.01-15(c); 111.54-1(b).
UL 514A, Standard for Metallic Outlet Boxes, 1991 (in- cluding revisions through April, 1995).	111.81-1(d).
UL 514B, Standard for Fittings for Conduit and Outlet Boxes, 1989 (including revisions through April, 1995).	111.81-1(d).
UL 514C, Standard for Nonmetallic Outlet Boxes, Flush- Device Boxes, and Covers, 1988 (including revisions through April, 1995).	111.81-1(d).
UL 595, Standard for Marine-Type Electric Lighting Fix- tures, 1985 (including revisions through September, 1991).	111.75-20(a); 111.75-20(e).
UL 913, Standard for Intrinsically Safe Apparatus and As- sociated Apparatus for Use in Class I, II, and III Divi- sion 1, Hazardous (Classified) Locations, 1988.	111.105-11(a).
UL 1042, Standard for Electric Baseboard Heating Equip- ment, 1994 (including revisions through November, 1995).	111.87-3(a).

UL 1072, Standard for Medium-Voltage Power Cables, 1995 (including revisions through January, 1996).	111.60-1(e).
UL 1096, Standard for Electric Central Air Heating Equipment, 1986 (including revisions through January, 1988).	111.87-3(a).
UL 1104, Standard for Marine Navigation Lights, 1981 (including revisions through May, 1988).	111.75-17(d).
UL 1203, Standard for Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations, 1994 (including revisions through October, 1995).	111.105-9.
UL 1309, Standard for Marine Shipboard Cable, First edition, July 14, 1995.	111.60-1, 111.60-3.
UL 1569, Standard for Metal-Clad Cables, 1995 (including revisions through April, 1996).	111.60-23(a).
UL 1570, Standard for Fluorescent Lighting Fixtures, 1988 (including revisions through April, 1996).	111.75-20.
UL 1571, Standard for Incandescent Lighting Fixtures, 1995 (including revisions through April, 1996).	111.75-20.
UL 1572, Standard for High Intensity Discharge Lighting Fixtures, 1995 (including revisions through May, 1996).	111.75-20.
UL 1573, Standard for Stage and Studio Lighting Units, 1994 (including revisions through February, 1995).	111.75-20.
UL 1574, Standard for Track Lighting Systems, 1995 (including revisions through July, 1995).	111.75-20.
ANSI/UL 1581, Reference Standard for Electrical Wires, Cables, and Flexible Cords, 1991 (including revisions through January, 1996).	111.30-19(b); 111.60-2; 111.60-6(a).

(c) The word “should,” when used in material incorporated by reference, is to be construed the same as the words “must” or “shall” for the purposes of this subchapter.

[CGD 94-108, 61 FR 28271, June 4, 1996; 61 FR 33045, June 26, 1996; 61 FR 36786-36787, July 12, 1996; 61 FR 49691, Sept. 23, 1996, as amended at 62 FR 23906, May 1, 1997; CGD 97-057, 62 FR 51046, Sept. 30, 1997; USCG 1999-5151, 64 FR 67182, Dec. 1, 1999; USCG-2000-7790, 65 FR 58462, Sept. 29, 2000; USCG-1999-6096, 66 FR 29911, June 4, 2001]

**Subpart 110.15—Terms Used in This Subchapter**

**§ 110.15-1 Definitions.**

As used in this subchapter—

(a) The electrical and electronic terms are defined in IEEE Std 100 or IEC 92-101.

(b) In addition to the definitions in paragraph (a) of this section—

*Coastwise Vessel* means a vessel that normally navigates the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore and is certificated for coastwise navigation by the Coast Guard.

*Commandant* means the Commandant of the Coast Guard.

*Corrosion resistant material or finish* means any material or finish that meets the testing requirements of ASTM B 117 (incorporated by reference, see §110.10-1) or test Kb in IEC 68-2-52 for 200 hours and does not show pitting, cracking, or other deterioration more severe than that resulting from a similar test on passivated AISI Type 304 stainless steel.

*Corrosive location* means a location exposed to the weather on vessels operating in salt water or a location on board which may be exposed to the corrosive effects of the cargo carried or of the vessel’s systems.

*Dead ship condition* is the condition in which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

*Dripproof* means enclosed so that equipment meets at least a NEMA 250 Type 1 with dripshield, NEMA 250 Type 2, NEMA 250 Type 12, or IEC IP 22 rating.

*Embarkation station* means a location from which persons embark into survival craft or are assembled before embarking into survival craft.

*Emergency squad* means the crew designated on the station bill as the nucleus of a damage control party.

*Flashpoint* means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, as specified by the appropriate test procedure and apparatus.

*Great Lakes vessel* means a vessel that navigates exclusively on the Great Lakes and their connecting and tributary waters.

*Independent laboratory* means a laboratory that is accepted by the Commandant under part 159 of this chapter for the testing and listing or certification of electrical equipment.

*Location not requiring an exceptional degree of protection* means a location which is not exposed to the environmental conditions outlined in the definition for locations requiring exceptional degrees of protection. This location requires the degree of protection of §111.01-9 (c) or (d) of this chapter. These locations include—

- (1) An accommodation space;
- (2) A dry store room;
- (3) A passageway adjacent to quarters;
- (4) A water closet without a shower or bath;
- (5) A radio, gyro and chart room; and
- (6) A location with similar environmental conditions.

*Location requiring an exceptional degree of protection* means a location exposed to weather, seas, splashing, pressure-directed liquids, or similar moisture conditions. These locations include—

- (1) On deck;
- (2) A machinery space;
- (3) A cargo space;
- (4) A location within a galley or pantry area, laundry, or water closet which contains a shower or bath; and
- (5) Other spaces with similar environmental conditions.

*Marine inspector or inspector* means a civilian employee or military member of the Coast Guard assigned by an Officer in Charge, Marine Inspection, or the Commandant to perform duties with respect to the inspection, enforcement, and administration of vessel safety and navigation laws and regulations.

*Nonsparking fan* means nonsparking fan as defined in ABS Rules for Build-

ing and Classing Steel Vessels, section 4/5B7.7.

*Ocean vessel* means a vessel that navigates the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore and is certificated by the Coast Guard for ocean navigation.

*Qualified person* means a person who by virtue of that person's knowledge, ability, experience, specialized training, or licensing can competently and safely perform required electrical duties or functions.

*Waterproof* means watertight; except that, moisture within or leakage into the enclosure is allowed if it does not interfere with the operation of the equipment enclosed. In the case of a generator or motor enclosure, *waterproof* means watertight; except that, leakage around the shaft may occur if the leakage is prevented from entering the oil reservoir and the enclosure provides for automatic drainage.

*Watertight* means enclosed so that equipment meets at least a NEMA 250 Type 4 or 4X or an IEC IP 56 rating.

[CGD 94-108, 61 FR 28274, June 4, 1996, as amended at 62 FR 23907, May 1, 1997; 62 FR 27659, May 20, 1997; USCG-2000-7790, 65 FR 58462, Sept. 29, 2000]

## Subpart 110.20—Equivalents

### § 110.20-1 Equivalents.

The Commanding Officer, Marine Safety Center (MSC), may approve any arrangement, fitting, appliance, apparatus, equipment, calculation, information, or test that provides a level of safety equivalent to that established by specific provisions of this subchapter. Requests for approval must be submitted to the Marine Safety Center. If necessary, the Marine Safety Center may require engineering evaluations and tests to demonstrate the equivalence of the substitute.

[CGD 94-108, 61 FR 28275, June 4, 1996]

## Subpart 110.25—Plan Submittal

### § 110.25-1 Plans and information required for new construction.

The following plans, if applicable to the particular vessel, must be submitted for Coast Guard review in accordance with §110.25-3:

§ 110.25-1

46 CFR Ch. I (10-1-06 Edition)

NOTE: A Navigation and Vessel Inspection Circular on the Subject of "Coast Guard Review of Merchant Vessel Plans and Specifications" is available from the offices listed in § 110.25-3. The Circular recommends practices and procedures for plan submittals.

(a) Elementary one-line wiring diagram of the power system, supported, by cable lists, panelboard summaries, and other information including—

(1) Type and size of generators and prime movers;

(2) Type and size of generator cables, bus-tie cables, feeders, and branch circuit cables;

(3) Power, lighting, and interior communication panelboards with number of circuits and rating of energy consuming devices;

(4) Type and capacity of storage batteries;

(5) Rating of circuit breakers and switches, interrupting capacity of circuit breakers, and rating or setting of overcurrent devices;

(6) Computations of short circuit currents in accordance with Subpart 111.52; and

(7) Overcurrent protective device coordination analysis for each generator distribution system of 1500 kilowatts or above that includes selectivity and shows that each overcurrent device has an interrupting capacity sufficient to interrupt the maximum asymmetrical short-circuit current available at the point of application.

(b) Electrical plant load analysis including connected loads and computed operating loads for each condition of operation.

(c) Elementary and isometric or deck wiring plans, including the location of each cable splice, a list of symbols, and the manufacturer's name and identification of each item of electrical equipment, of each—

(1) Steering gear circuit and steering motor controller;

(2) General emergency alarm system;

(3) Sound-powered telephone or other fixed communication system;

(4) Power-operated boat winch;

(5) Fire detecting and alarm system;

(6) Smoke detecting system;

(7) Electric watertight door system;

(8) Fire door holding systems;

(9) Public address system;

(10) Manual alarm system; and

(11) Supervised patrol system.

(d) Deck wiring or schematic plans of power systems and lighting systems, including symbol lists, with manufacturer's name and identification of each item of electric equipment, and showing:

(1) Locations of cables;

(2) Cable sizes and types;

(3) Locations of each item of electric equipment;

(4) Locations of cable splices.

(e) Switchboard wiring diagram.

(f) Switchboard material and name-plate list.

(g) Elementary wiring diagram of metering and automatic switchgear.

(h) Description of operation of propulsion control and bus transfer switchgear.

(i) For vessels with hazardous locations for which part 111, subpart 111.105, is applicable, plans showing the extent and classification of all hazardous locations, including information on—

(1) Equipment identification by manufacturer's name and model number;

(2) Equipment use within the system;

(3) Cable parameters;

(4) Equipment locations;

(5) Installation details; and

(6) A certificate of testing, and listing or certification, by an independent laboratory, where required by the respective standard.

(j) Plans and installation instructions for each approved component of an intrinsically safe system listed or certified by an independent laboratory (see § 111.105-11 of this chapter).

(k) Motor starter elementary wiring diagram, enclosure drawing, and starter application.

(l) Plans and information sufficient to evaluate equipment to be considered for equivalency under § 110.20-1.

(m) Plans and information sufficient to evaluate equipment or systems required to meet the specifications of this Subchapter but not to be approved by the Commandant.

NOTE TO PARAGRAPH (m): This equipment evaluation is generally performed by the Commanding Officer, Marine Safety Center and includes items such as cable splices, signalling lights, shore connection boxes, submersible pumps, engine order telegraph systems, shaft speed and thrust indicator systems, and steering gear failure alarm systems.

(n) Plans and information sufficient to evaluate equipment required by this subchapter to meet a reference standard or military specification.

NOTE TO PARAGRAPH (n): This equipment evaluation is generally performed by the Commanding Officer, Marine Safety Center, and includes items such as circuit breakers, switches, lighting fixtures, air heating equipment, busways, outlet boxes, and junction boxes. Items required to meet an IEEE, IEC, NEMA, UL, ANSI, or other industry standard or a military specification are considered acceptable if manufacturer's certification of compliance is indicated on a material list or plan. However, if the standards require third-party testing and listing or certification, proof of listing or certification by an independent laboratory must also be submitted.

(o) Detailed analysis showing compliance with the MC cable requirements in § 111.60-23(b) of this chapter.

[CGD 74-125A, 47 FR 15232, Apr. 8, 1982, as amended by CGD 81-030, 53 FR 17846, May 18, 1988; CGD 94-108, 61 FR 28275, June 4, 1996; 62 FR 23907, May 1, 1997]

#### § 110.25-3 Procedure for submitting plans.

(a) The plans required by § 110.25-1 must be submitted to one of the following Coast Guard offices:

(1) Commanding Officer, U.S. Coast Guard Marine Safety Center (MSC), 400 Seventh St., SW., Washington, DC 20590-0001.

(2) The Officer in Charge, Marine Inspection at or nearest the place where the vessel is to be built.

(b) [Reserved]

(c) Three copies of each plan are required so that one can be returned to the submitter. If the submitter desires additional copies of approved plans, he should submit enough for the necessary distribution.

NOTE: The Coast Guard and the American Bureau of Shipping (ABS) coordinate plan review for vessels classed by the ABS in order to eliminate duplication of effort. An applicant for plan review of a vessel that is classed by the ABS should consult Commanding Officer, Marine Safety Center, to

determine applicable procedures for submitting plans.

[CGD 74-125A, 47 FR 15232, Apr. 8, 1982, as amended by CGD 82-063b, 48 FR 4781, Feb. 3, 1983; CGD 85-048b, 51 FR 15498, Apr. 24, 1986; CGD 88-070, 53 FR 34534, Sept. 7, 1988; CGD 89-025, 54 FR 19571, May 8, 1989; CGD 95-072, 60 FR 50465, Sept. 29, 1995; CGD 94-108, 61 FR 28275, June 4, 1996; CGD 96-041, 61 FR 50730, Sept. 27, 1996]

EDITORIAL NOTE: By CGD 96-041, 61 FR 50730, Sept. 27, 1996, paragraph (a)(1) of § 110.25-3 was amended by removing the word "(G-MSC)". However, by CGD 94-108, 61 FR 28275, June 4, 1996, the word "(G-MSC)" was removed and the word "(MSC)" was added in its place.

### Subpart 110.30—Testing and Inspection

#### § 110.30-1 General.

(a) This section supplements the general requirements for testing and inspecting vessels in other parts of this chapter.

(b) In the inspection of electric equipment and installations, the rules of the American Bureau of Shipping for materials and construction, and the certificate of classification that refers to them, except as otherwise provided by this subchapter, are accepted as standard.

(c) This subpart must not be construed to imply that shop tests or factory inspections of electric apparatus or equipment of the types conducted by the American Bureau of Shipping are conducted by the Coast Guard. Shop tests of electric apparatus or equipment are conducted by the Coast Guard only when required by this chapter or when requested, either by the manufacturer, shipbuilder, owner, or the Coast Guard, and agreed to by all.

[CGD 74-125A, 47 FR 15232, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28275, June 4, 1996]

#### § 110.30-3 Initial inspection.

The initial inspection, which may be a series of inspections during the construction of the vessel, includes a complete inspection of the electric installation and electric equipment or apparatus. The inspection is to determine that the arrangement, materials, and their installations meet this chapter

## § 110.30-5

and the approved plans. The inspection also is to determine that the workmanship of all equipment and apparatus and the installation is satisfactory.

### § 110.30-5 Inspection for certification.

Electric installations and electric equipment must be inspected at the inspection for certification and periodic inspection to determine mechanical and electrical condition and performance. Particular note must be made of circuits added or modified after the original issuance of the Certificate of Inspection.

[USCG 1999-4976, 65 FR 6504, Feb. 9, 2000]

### § 110.30-7 Repairs or alterations.

The Officer in Charge, Marine Inspection must be notified before—

(a) Alterations or modifications that deviate from approved plans; or

(b) Repairs, alterations, or modifications that affect the safety of the vessel.

[CGD 94-108, 61 FR 28275, June 4, 1996]

## PART 111—ELECTRIC SYSTEMS— GENERAL REQUIREMENTS

### Subpart 111.01—General

Sec.

- 111.01-1 General.
- 111.01-3 Placement of equipment.
- 111.01-5 Protection from bilge water.
- 111.01-7 Accessibility and spacing.
- 111.01-9 Degrees of protection.
- 111.01-11 Corrosion-resistant parts.
- 111.01-13 Limitations on porcelain use.
- 111.01-15 Temperature ratings.
- 111.01-17 Voltage and frequency variations.
- 111.01-19 Inclination of the vessel.

### Subpart 111.05—Equipment Ground, Ground Detection, and Grounded Systems

- 111.05-1 Purpose.

#### EQUIPMENT GROUND

- 111.05-3 Design, construction, and installation; general.
- 111.05-7 Armored and metallic-sheathed cable.
- 111.05-9 Masts.

#### SYSTEM GROUNDING

- 111.05-11 Hull return.
- 111.05-13 Grounding connection.
- 111.05-15 Neutral grounding.

## 46 CFR Ch. I (10-1-06 Edition)

- 111.05-17 Generation and distribution system grounding.
- 111.05-19 Tank vessels; grounded distribution systems.

#### GROUND DETECTION

- 111.05-21 Ground detection.
- 111.05-23 Location of ground indicators.
- 111.05-25 Ungrounded systems.
- 111.05-27 Grounded neutral alternating current systems.
- 111.05-29 Dual voltage direct current systems.

#### GROUNDING CONDUCTORS

- 111.05-31 Grounding conductors for systems.
- 111.05-33 Equipment safety grounding (bonding) conductors.
- 111.05-37 Overcurrent devices.

### Subpart 111.10—Power Supply

- 111.10-1 Definitions.
- 111.10-3 Two generating sources.
- 111.10-4 Power requirements, generating sources.
- 111.10-5 Multiple energy sources.
- 111.10-7 Dead ship.
- 111.10-9 Ship's service supply transformers; two required.

### Subpart 111.12—Generator Construction and Circuits

- 111.12-1 Prime movers.
- 111.12-3 Excitation.
- 111.12-5 Generator construction and testing.
- 111.12-7 Voltage regulation and parallel operation.
- 111.12-9 Generator cables.
- 111.12-11 Generator protection.
- 111.12-13 Propulsion generator protection.

### Subpart 111.15—Storage Batteries and Battery Chargers: Construction and Installation

- 111.15-1 General.
- 111.15-2 Battery construction.
- 111.15-3 Battery categories.
- 111.15-5 Battery installation.
- 111.15-10 Ventilation.
- 111.15-20 Conductors.
- 111.15-25 Overload and reverse current protection.
- 111.15-30 Battery chargers.

### Subpart 111.20—Transformer Construction, Installation, and Protection

- 111.20-1 General requirements.
- 111.20-5 Temperature rise.
- 111.20-10 Autotransformers.
- 111.20-15 Transformer overcurrent protection.