

§ 111.01-3 Placement of equipment.

(a) Electric equipment must be arranged, as far as practicable, to prevent mechanical damage to the equipment from the accumulation of dust, oil vapors, steam, or dripping liquids.

(b) Apparatus that may arc must be ventilated or be in ventilated compartments in which flammable gases, acid fumes, and oil vapors cannot accumulate. Skylights and ventilators must be arranged to prevent flooding of the apparatus.

§ 111.01-5 Protection from bilge water.

Each of the following in or around the bilge area must be arranged or constructed so that it cannot be damaged by bilge water:

- (a) Generators.
- (b) Motors.
- (c) Electric coupling.
- (d) Electric cable.

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

§ 111.01-7 Accessibility and spacing.

(a) The design and arrangement of electric apparatus must afford accessibility to each part as needed to facilitate proper inspection, adjustment, maintenance, or replacement.

(b) Within an enclosure, the spacing between energized components (or between an energized component and ground) must be to the appropriate industry standard for the voltage and current utilized in the circuit. Additionally, spacing within any enclosure must be sufficient to facilitate servicing.

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

§ 111.01-9 Degrees of protection.

(a) Interior electrical equipment exposed to dripping liquids or falling solid particles must be manufactured to at least NEMA 250 Type 2 or IEC IP 22 degree of protection as appropriate for the service intended.

(b) Electrical equipment in locations requiring exceptional degrees of protection as defined in §110.15-1 of this chapter must be enclosed to meet at least the minimum degrees of protection in ABS Rules for Building and Classing Steel Vessels, table 4/5B.1, or appropriate NEMA 250 Type for the service intended. Each enclosure must

be designed in such a way that the total rated temperature of the equipment inside the enclosure is not exceeded.

(c) Central control consoles and similar control enclosures must be manufactured to at least NEMA 250 Type 2 or IEC IP 22 degree of protection regardless of location.

(d) Equipment for interior locations not requiring exceptional degrees of protection must be manufactured to at least NEMA 250 Type 1 with dripshield or IEC IP 11.

NOTE TO §111.01-9: The degrees of protection specified in this section are described in NEMA Standards Publication No. 250 and IEC IP Code 529 and designated in ABS Rules for Building and Classing Steel Vessels, table 4/5B.1.

[CGD 94-108, 61 FR 28275, June 4, 1996, as amended at 62 FR 23907, May 1, 1997]

§ 111.01-11 Corrosion-resistant parts.

Each enclosure and part of electric equipment that can be damaged by corrosion must be made of corrosion-resistant materials or of materials having a corrosion resistant finish.

§ 111.01-13 Limitations on porcelain use.

Porcelain must not be used for lamp sockets, switches, receptacles, fuse blocks, or other electric equipment where the item is solidly mounted by machine screws or their equivalent, unless the porcelain piece is resiliently mounted.

§ 111.01-15 Temperature ratings.

(a) In this subchapter, an ambient temperature of 40°C is assumed except as otherwise stated.

(b) A 50°C ambient temperature is assumed for all rotating electrical machinery in boiler rooms, engine rooms, auxiliary machinery rooms, and weather decks, unless it can be shown that a 45°C ambient temperature will not be exceeded in these spaces.

(c) A 45°C ambient temperature is assumed for cable and all other non-rotating electrical equipment in boiler rooms, in engine rooms, in auxiliary machinery rooms, and on weather decks. For installations using UL 489 SA marine type circuit breakers the

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ambient temperature for that component is assumed to be 40°C. For installations using Navy type circuit breakers the ambient temperature for that component is assumed to be 50°C.

(d) Unless otherwise indicated in this subchapter, a 55°C ambient temperature is assumed for all control and instrumentation equipment.

(e) If electrical equipment is utilized in a space in which the equipment's rated ambient temperature is below the assumed ambient temperature of the space, its load must be derated. The assumed ambient temperature of the space plus the equipment's actual temperature rise at its derated load must not exceed the equipment's total rated temperature (equipment's rated ambient temperature plus its rated temperature rise).

[CGD 94-108, 61 FR 28276, June 4, 1996, as amended at 62 FR 23907, May 1, 1997]

§ 111.01-17 Voltage and frequency variations.

Unless otherwise stated, electrical equipment must function at variations of at least ± 5 percent of rated frequency and +6 percent to -10 percent of rated voltage. This limitation does not address transient conditions.

[CGD 94-108, 61 FR 28276, June 4, 1996]

§ 111.01-19 Inclination of the vessel.

(a) All electrical equipment must be designed and installed to operate for the particular location and environment in which it is to be used. Additionally, electrical equipment necessary for the maneuvering, navigation, and safety of the vessel or its personnel must be designed and installed to operate under any combination of the following conditions:

(1) 15 degrees static list, 22.5 degrees dynamic roll; and

(2) 7.5 degrees static trim.

(b) All emergency installations must be designed and installed to operate when the vessel is at 22.5 degrees list and 10 degrees trim.

[CGD 94-108, 61 FR 28276, June 4, 1996, as amended at 62 FR 23907, May 1, 1997]

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

§ 111.05-1 Purpose.

This subpart contains requirements for the grounding of electric systems, circuits, and equipment.

NOTE: Circuits are grounded to limit excessive voltage from lightning, transient surges, and unintentional contact with higher voltage lines, and to limit the voltage to ground during normal operation. Conductive materials enclosing electric conductors and equipment, or forming part of that equipment, are grounded to prevent a voltage above ground on the enclosure materials.

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28276, June 4, 1996]

EQUIPMENT GROUND

§ 111.05-3 Design, construction, and installation; general.

(a) An electric apparatus must be designed, constructed, and installed to prevent any person from accidentally contacting energized parts.

(b) Exposed, noncurrent-carrying metal parts of fixed equipment that may become energized because of any condition must be grounded.

(c) Exposed, noncurrent-carrying metal parts of portable equipment must be grounded through a conductor in the supply cable to the grounding pole in the receptacle.

(d) If the installation of the electrical equipment does not ensure a positive ground to the metal hull or equivalent conducting body, the apparatus must be grounded to the hull with a grounding conductor.

§ 111.05-7 Armored and metallic-sheathed cable.

When installed, the metallic armor or sheath must meet the installation requirements of IEC 92-3 or section 20 of IEEE Std 45.

[CGD 94-108, 61 FR 28276, June 4, 1996]

§ 111.05-9 Masts.

Each nonmetallic mast and topmast must have a lightning ground conductor in accordance with section 10 of IEC 92-401.

[CGD 94-108, 62 FR 23907, May 1, 1997]