

**§ 111.30-19**

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

(d) A secondary circuit of a current transformer must not be fused, and the circuit from a current transformer to a device that is not in the switchboard must have a high voltage protector to short the transformer during an open circuit.

**§ 111.30-19 Buses and wiring.**

(a) *General.* Each bus must meet the requirements of either—

- (1) Section 17.11 of IEEE Std 45; or
- (2) IEC 92-302 (clause 6).

(b) *Wiring.* Instrumentation and control wiring must be—

- (1) Suitable for installation within in a switchboard enclosure and be rated at 90° C or higher;
- (2) Stranded copper;
- (3) No. 14 AWG (2.10 mm<sup>2</sup>) or larger or must be ribbon cable or similar conductor size cable recommended for use in low-power instrumentation, monitoring, or control circuits by the equipment manufacturer;

(4) Flame retardant meeting ANSI/UL 1581 test VW-1 or IEC 332-1; and

(5) Extra flexible, if used on a hinged panel.

[CGD 94-108, 61 FR 28278, June 4, 1996, as amended at 62 FR 23908, May 1, 1997]

**§ 111.30-24 Generation systems greater than 3000 kw.**

Except on a non-self-propelled mobile offshore drilling unit (MODU) and a non-self-propelled floating Outer Continental Shelf facility, when the total installed electric power of the ship's service generation system is more than 3000 kW, the switchboard must have the following:

(a) At least two sections of the main bus that are connected by:

- (1) A non-automatic circuit breaker;
- (2) A disconnect switch; or
- (3) Removable links.

(b) As far as practicable, the connection of generators and duplicated equipment equalized between the sections of the main bus.

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28279, June 4, 1996]

**§ 111.30-25 Alternating-current ship's service switchboards.**

(a) Except as allowed in paragraph (g) of this section, each alternating-cur-

rent ship's service switchboard must have the equipment required by paragraphs (b) through (f) of this section.

(b) For each connected generator, each switchboard must have the following:

(1) A circuit breaker that meets § 111.12-11 and § 111.50-5.

(2) A disconnect switch or link for each generator conductor, except a switchboard having a draw-out or plug-in type generator circuit breaker that disconnects:

- (i) Each generator conductor; or
- (ii) If there is a switch in the generator neutral, each ungrounded conductor.

(3) A pilot lamp connected between the generator and the circuit breaker.

(4) An ammeter with a selector switch that connects the ammeter to show the current in each phase.

(5) A voltmeter with a selector switch that connects the voltmeter to show the:

- (i) Generator voltage of each phase; and
- (ii) Bus voltage of one phase.

(6) A voltage regulator and voltage regulator functional cut-out switch.

(c) For each generator that is not excited from a variable voltage or rotary amplifier that is controlled by a voltage regulator unit acting on the exciter field, each switchboard must have:

- (1) A generator field rheostat;
- (2) A double-pole field switch;
- (3) Discharge clips; and
- (4) A discharge resistor.

(d) If generators are arranged for parallel operation, each switchboard must have:

- (1) A speed control for the prime mover of each generator;
- (2) An indicating wattmeter for each generator; and

(3) A synchroscope and synchronizing lamp that have a selector switch to show synchronization for paralleling generators.

(e) Each switchboard must have the following:

- (1) Ground detection that meets Subpart 111.05 for the:
  - (i) Ship's service power system;
  - (ii) Normal lighting system; and
  - (iii) Emergency lighting system.