

§ 161.002-3 Materials and workmanship.

(a) *Suitability.* All materials used in the construction of fire-protective equipment shall be of the quality best suited for the purpose intended.

(b) *Materials covered by reference specifications.* Where specifications are referred to for a given material, it is intended to require that the quality of material used shall be at least equal to that covered in the reference specifications.

[21 FR 9032, Nov. 21, 1956, as amended by CGD 94-108, 61 FR 28292, June 4, 1996]

§ 161.002-4 General requirements.

(a) *Introduction.* The purpose of fire-protective systems is to give warning of the presence of fire in the protected spaces. To meet this end, the basic requirements of the fire-protective systems are reliability, sturdiness, simplicity of design, ease of servicing, and the ability to withstand shipboard shock and vibration and the adverse effects of sea humidity.

(b) *Standards.* (1) All fire-protective systems must be designed, constructed, tested, marked, and installed according to the applicable standards under § 161.002-1 and subchapter J (Electrical Engineering) of this chapter.

(2) All systems must be listed or certified as meeting these standards by an independent laboratory that is accepted by the Commandant under part 159 of this chapter for the testing and listing or certification of fire detection equipment and systems.

(3) All parts of the system must pass the environmental tests for control and monitoring equipment in either ABS Rules for Building and Classing Steel Vessels Table 4/11.1 or pass the Category ENV3 tests of Lloyd's Register Type Approval System, Test Specification Number 1, as appropriate.

(4) Those parts of the system that are to be installed in locations requiring exceptional degrees of protection (defined in § 110.15-1 of this chapter) must also pass the salt spray (mist) test in either ABS Rules for Building and Classing Steel Vessels Table 4/11.1; Lloyd's Register Type Approval System, Test Specification No. 1; or ASTM B 117 (incorporated by reference, see

§ 161.002-1) with results as described in corrosion-resistant finish in § 110.15-1 of this chapter.

[21 FR 9032, Nov. 21, 1956, as amended by CGD 94-108, 61 FR 28292, June 4, 1996; 62 FR 23910, May 1, 1997; USCG-2000-7790, 65 FR 58464, Sept. 29, 2000; USCG-2004-18884, 69 FR 58350, Sept. 30, 2004]

§ 161.002-8 Automatic fire detecting systems, general requirements.

(a) *General.* An automatic fire detecting system shall consist of a power supply; a control unit on which are located visible and audible fire and trouble signalling devices; and fire detector circuits, as required, originating from the control unit. Power failure alarm devices may be separately housed from the control unit and may be combined with other power failure alarm systems when specifically approved.

(b) [Reserved]

[21 FR 9032, Nov. 21, 1956, as amended by CGD 94-108, 61 FR 28292, June 4, 1996]

§ 161.002-9 Automatic fire detecting system, power supply.

The power supply for an automatic fire detecting system must meet the requirements of § 113.10-9 of subchapter J (Electrical Engineering Regulations) of this chapter.

[CGD 74 FR 125a, 47 FR 15279, Apr. 8, 1982]

§ 161.002-10 Automatic fire detecting system control unit.

(a) *General.* The fire detecting system control unit shall consist of a dripproof enclosed panel containing visible and audible fire alarm signalling devices, visible and audible trouble alarm signalling devices, visible and audible power failure alarm devices, power supply transfer switch, charging equipment when employed, and overcurrent protection for power supplies.

(b) *Fire alarms*—(1) *General.* The operation of a fire detecting and alarm system must cause automatically—

(i) The sounding of a vibrating type fire bell with a gong diameter not smaller than 15 cm (6 inches) or other audible alarm that has an equivalent sound level and that is mounted at the control unit and at the remote annunciator panel, when provided;

(ii) The sounding of a vibrating type fire bell with a gong diameter not smaller than 20 cm (8 inches) or other audible alarm that has an equivalent sound level and that is located in the engine room; and

(iii) an indication of the fire detecting zone from which the signal originated, visible at the control unit and at the remote annunciator panel, when provided;

(2) *Maintaining alarm.* The audible and visible alarms resulting from the operation of a fire detector having self-restoring contacts shall be maintained automatically by the control unit until a resetting device is operated manually.

(3) *Silencing audible alarm.* Manual means shall be provided at the control unit to silence the audible fire alarms, but operation of the audible fire alarm device shall permit the visible fire alarm to remain until manually reset as described in paragraph (b)(2) of this section.

(4) *Non-interference.* The control unit shall be so arranged as to permit one or any number of fire alarms simultaneously, and an alarm on one circuit shall not interfere with the normal operation of any other circuit, except that the audible fire alarms, when silenced by the means provided by paragraph (b)(3) of this section, need not sound upon receipt of succeeding sensor signals.

(5) *Source of energy.* The source of energy for the alarms referred to in this paragraph shall be the "normal source". On a system supplied by duplicate storage batteries, the "normal source" shall be construed to mean that part of the supply circuit on the load side of the battery transfer switch and fuses. On a system supplied by a branch circuit the "normal source" shall be construed to mean the load side of any transformer or rectifier employed to modify the nature or magnitude of the supply potential.

(c) *Electrical supervision—(1) Circuits.* The circuits formed by conductors extending from the control unit to the fire detectors of each zone shall be electrically supervised.

(2) *Normal source.* The normal source of energy to the control unit shall be electrically supervised.

(3) *Audible fire alarms.* The engine room audible fire alarm shall be electrically supervised.

(d) *Power failure alarms—(1) Loss of potential.* The loss of potential from a supervised normal source of energy automatically shall be indicated at the control unit by the sounding of an audible power failure alarm. The source of energy for the alarm shall be the emergency power source. The source of energy for the alarm of a system supplied by duplicate storage batteries shall be the storage battery being charged.

(2) *Silencing audible alarm.* Means shall be provided at the control unit to silence the audible power failure alarm by transferring the signal to a visible indicator which shall remain until the silencing means is restored to its normal position.

(e) *Trouble alarms—(1) Open Circuit.* An open circuit occurring in either supervised circuit covered by paragraph (c) (1) or (3) of this section shall automatically be indicated at the control unit by the sounding of an audible trouble alarm and by a visual indicator showing the circuit or zone from which the signal originated except that on systems employing closed-circuit series connected detectors, an open circuit in the zone wiring may cause a fire alarm.

(2) *Silencing audible alarm.* Manual means shall be provided at the control unit to silence the audible alarm. Operation of the silencing means shall permit the visible alarm to remain until the trouble has been corrected.

(3) *Non-interference.* The control unit shall be so arranged as to permit one or any number of trouble alarms simultaneously, and an alarm on one circuit shall not interfere with the normal operation of any other circuit, except that the audible trouble alarm, when silenced by the means provided by paragraph (e)(2) of this section, need not sound on receipt of succeeding trouble signals.

(4) *Source of energy.* The source of energy for the trouble alarms required by this paragraph shall be the normal source as defined in paragraph (b)(5) of this section.

(f) *Circuit testing*—(1) *Fire alarm and trouble alarm test.* Means shall be provided at the control unit for individually testing each fire detecting zone circuit. The testing means shall be capable of simulating a fire condition and a trouble condition.

(2) *Ground test.* Means shall be provided at the control unit for manual testing of each individual fire detecting zone circuit for the presence of grounds. Systems whose normal source of supply is derived from a circuit from the ship's alternating-current temporary emergency bus shall be provided with a two-winding transformer in the supply circuit and located in the control unit to isolate electrically the fire detecting system from the ship's electrical system.

(g) *Power supply transfer switch.* An automatic transfer switch with no "off" position shall be provided in the control unit for selecting the source of power, except that systems employing duplicate storage batteries may be provided with a manual transfer switch.

(1) *Automatic transfer switch.* Upon reduction of potential from the normal power source of 15 to 20 percent, the automatic fire detection system shall automatically be disconnected from the normal source and connected to the emergency source. Upon restoration of potential from the normal source of 85 to 95 percent of normal values, the automatic fire detection system shall automatically be transferred back to normal source.

(2) *Manual transfer switch.* Automatic fire detecting systems employing duplicate storage batteries as the power supplies shall be provided with a manual transfer switch with no "off" position to select the battery to supply the system and the battery to be charged.

(h) *Automatic fire detecting system, battery charging and control*—(1) *General.* Automatic fire detecting systems employing duplicate storage batteries as the power supply shall be provided with battery charging and control facilities as specified by this paragraph.

(2) *Transfer switch.* A manual transfer switch shall be provided in accordance with paragraph (g)(2) of this section.

(3) *Voltmeter and voltmeter switch.* A voltmeter and a voltmeter switch shall be provided at the control unit and

connected to read (i) voltage of battery supplying system and (ii) voltage of battery on charge.

(4) *Ammeter.* An ammeter shall be provided to indicate the charging current to the battery on charge.

(5) *Reverse current protection.* An undervoltage or reverse current relay shall be provided to disconnect the battery on charge from the charging source in the event of loss of potential from the charging source unless reverse current flow is effectively blocked by a rectifier.

(6) *Resistors.* Fixed and variable resistors shall be provided to regulate the charging rate, together with a two-position switch to select between a normal charging rate and a high charging rate.

(7) *Overcurrent protection.* The batteries shall be protected against overcurrent by fuses rated at not less than 150 percent and not more than 200 percent of the maximum normal battery load.

(8) *Location.* The equipment required by this paragraph shall be located in or adjacent to the control unit.

[CGFR 56-39, 21 FR 9035, Nov. 21, 1956, as amended by CGFR 70-143, 35 FR 19666, Dec. 30, 1970; CGD 94-108, 61 FR 49691, Sept. 23, 1996; USCG-2004-18884, 69 FR 58350, Sept. 30, 2004]

§ 161.002-12 Manual fire alarm systems.

(a) *General.* A manual fire alarm system shall consist of a power supply, a control unit on which are located visible and audible fire and trouble alarms, and fire alarm circuits as required originating from the control unit and terminating at manual fire alarm boxes. Power failure alarm devices may be separately housed from the control unit and may be combined with other power failure alarm systems when specifically approved.

(b) *Types.* Manual fire alarm systems shall be one of the following types, or a combination of several types:

(1) Manual fire alarm stations superimposed on and connected as an integral part of the fire detector circuit wiring of an automatic fire detection system.

(2) Electrical system using manually operated fire alarm boxes.