

## § 154.1405

each having at least a 30 minute capacity.

(3) Eight steel-cored lifelines.

(4) Eight Type II or Type III flashlights constructed and marked in accordance with ASTM F 1014 (incorporated by reference, see §154.1).

(5) Three fire axes.

(6) Eight helmets that meet ANSI Safety Requirements for Industrial Head Protection, Z-89.1 (1969).

(7) Eight sets of boots and gloves that are made of rubber or other electrically non-conductive material.

(8) Eight sets of goggles that meet the specifications of ANSI Practice for Occupational and Educational Eye and Face Protection, Z-87.1 (1979).

(9) Five outfits that protect the skin from scalding steam and the heat of a fire, and that have a water resistant outer surface.

(10) Three chemical protective outfits that protect the wearers from the particular personnel hazards presented by the cargo vapor.

(c) When Table 4 references this section, a vessel carrying the listed cargo must have the following additional personnel protection equipment:

(1) Three self-contained, pressure-demand-type, air-breathing apparatus approved by the Mining Enforcement and Safety Administration (MESA) or the National Institute for Occupational Safety and Health (NIOSH), each having at least a 30 minute capacity.

(2) Nine spare bottles of air for the self-contained air-breathing apparatus, each having at least a 30 minute capacity.

(3) Three steel-cored lifelines.

(4) Three Type II or Type III flashlights constructed and marked in accordance with ASTM F 1014 (incorporated by reference, see §154.1).

(5) Three helmets that meet ANSI Safety Requirements for Industrial Head Protection, Z-89.1 (1969).

(6) Three sets of boots and gloves that are made of rubber or other electrically non-conductive material.

(7) Three sets of goggles that meet the specifications of ANSI Practice for Occupational and Educational Eye and Face Protection, Z-87.1 (1979).

(8) Three chemical protective outfits that protect the wearers from the par-

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ticular personnel hazards presented by the cargo vapor.

[CGD 74-289, 44 FR 26009, May 3, 1979, as amended by CGD 77-069, 52 FR 31630, Aug. 21, 1987; CGD 82-042, 17705, May 18, 1988; USCG-1999-5151, 64 FR 67183, Dec. 1, 1999]

### § 154.1405 Respiratory protection.

When Table 4 references this section, a vessel carrying the listed cargo must have:

(a) Respiratory protection equipment for each person on board that protects the person from the cargo vapor for at least 5 minutes; and

(b) Two additional sets of respiratory protection equipment that:

(1) Are stowed in the wheelhouse; and  
(2) Protects the wearer from the cargo vapor for at least 5 minutes.

### § 154.1410 Decontamination shower.

When Table 4 references this section, a vessel carrying the listed cargo must have a decontamination shower and an eye wash that:

(a) Are on the weatherdeck; and  
(b) Have their location marked EMERGENCY SHOWER in letters:  
(1) 7.6 cm (3 in.) high; and  
(2) 5.1 cm (2 in.) wide.

### § 154.1415 Air compressor.

Each vessel must have an air compressor to recharge the bottles for the air-breathing apparatus.

### § 154.1420 Stretchers and equipment.

Each vessel must have:

(a) Two stretchers or wire baskets; and  
(b) Equipment for lifting an injured person from a cargo tank, hold, or void space.

### § 154.1430 Equipment locker.

One of each item of equipment under §§154.1400 and 154.1420 must be stowed in a marked locker:

(a) On the open deck in or adjacent to the cargo area; or  
(b) In the accommodation house, near to a door that opens onto the main deck.

### § 154.1435 Medical first aid guide.

Each vessel must have a copy of the *IMO Medical First Aid Guide for Use in*

*Accidents Involving Dangerous Goods*, printed by IMO, London, U.K.

**§ 154.1440 Antidotes.**

Each vessel must have the antidotes prescribed in the *IMO Medical First Aid Guide for Use in Accidents Involving Dangerous Goods*, printed by IMO, London, U.K. for the cargoes being carried.

**Subpart D—Special Design and Operating Requirements**

**§ 154.1700 Purpose.**

This subpart prescribes design and operating requirements that are unique for certain cargoes regulated by this part.

**§ 154.1702 Materials of construction.**

When Table 4 references one of the following paragraphs in this section, the materials in the referenced paragraph must not be in components that contact the cargo liquid or vapor:

- (a) Aluminum and aluminum bearing alloys.
- (b) Copper and copper bearing alloys.
- (c) Zinc or galvanized steel.
- (d) Magnesium.
- (e) Mercury.
- (f) Acetylide forming materials, such as copper, silver, and mercury.

**§ 154.1705 Independent tank type C.**

The following cargoes must be carried in an independent tank type C that meets §154.701(a):

- (a) Ethylene oxide.
- (b) Methyl bromide.
- (c) Sulfur dioxide.

**§ 154.1710 Exclusion of air from cargo tank vapor spaces.**

When a vessel is carrying acetaldehyde, butadiene, ethylene oxide, or vinyl chloride, the master shall ensure that air is:

- (a) Purged from the cargo tanks and associated piping before the cargo is loaded; and
- (b) Excluded after the cargo is loaded by maintaining a positive pressure of at least 13.8 kPa gauge (2 psig) by:
  - (1) Introducing a gas that:
    - (i) Is not reactive;
    - (ii) Is not flammable; and
    - (iii) Does not contain more than 0.2% oxygen by volume; or

- (2) Controlling the cargo temperature.

**§ 154.1715 Moisture control.**

When a vessel is carrying sulfur dioxide, the master shall ensure that:

- (a) A cargo tank is dry before it is loaded with sulfur dioxide; and
- (b) Air or inert gas admitted into a cargo tank carrying sulfur dioxide during discharging or tank breathing has a moisture content equal to or less than the moisture content of air with a dew-point of  $-45^{\circ}\text{C}$  ( $-49^{\circ}\text{F}$ ) at atmospheric pressure.

**§ 154.1720 Indirect refrigeration.**

A refrigeration system that is used to cool acetaldehyde, ethylene oxide, or methyl bromide, must be an indirect refrigeration system that does not use vapor compression.

**§ 154.1725 Ethylene oxide.**

(a) A vessel carrying ethylene oxide must:

- (1) Have cargo piping, vent piping, and refrigeration equipment that have no connections to other systems;
- (2) Have valves, flanges, fittings, and accessory equipment made of steel, stainless steel, except types 416 and 442, or other material specially approved by the Commandant (G-MSO);
- (3) Have valve disk faces, and other wearing parts of valves made of stainless steel containing not less than 11% chromium;
- (4) Have gaskets constructed of spirally wound stainless steel with teflon or other material specially approved by the Commandant (G-MSO);
- (5) Not have asbestos, rubber, or cast iron components in the cargo containment system and piping;
- (6) Not have threaded joints in cargo piping;
- (7) Have a water spray system under §154.1105 that protects the above deck cargo piping; and
- (8) Have a nitrogen inerting system or on board nitrogen gas storage that can inert the vapor space of an ethylene oxide cargo tank for a period of 30 days under the condition of paragraph (e) of this section.
  - (b) Cargo hose used for ethylene oxide must: