

before the master may approve operations involving the use of fire, open flame, or spark- or arc-producing equipment in that hold or adjacent space.

§ 148.407 Smoking.

When Table 148.10 of this part associates a material with a reference to this section, and that material is being loaded or unloaded, smoking is prohibited anywhere on the weatherdeck of the vessel. While such a material is on board the vessel, smoking is prohibited in spaces adjacent to the cargo hold and on the vessel's deck in the vicinity of cargo hatches, ventilator outlets, and other accesses to the hold containing the material. "NO SMOKING" signs must be displayed in conspicuous locations in the areas where smoking is prohibited.

§ 148.410 Fire hoses.

When Table 148.10 of this part associates a material with a reference to this section, a fire hose must be available at each hatch through which the material is being loaded.

§ 148.415 Toxic gas analyzers.

When Table 148.10 of this part associates a material with a reference to a paragraph in this section, each vessel transporting the material, other than an unmanned barge, must have on board a gas analyzer appropriate for the toxic gas listed in that paragraph. At least two members of the crew must be knowledgeable in the use of the equipment. The equipment must be maintained in a condition ready for use and calibrated according to the instructions of its manufacturer. The atmosphere in the cargo hold and adjacent spaces must be tested before a person is allowed to enter these spaces. If toxic gases are detected, the space must be ventilated and retested before entry. The toxic gases for which the requirements of this section must be met are:

- (a) Arsine;
- (b) Carbon monoxide;
- (c) Hydrogen cyanide;
- (d) Hydrogen sulfide;
- (e) Phosphine; and
- (f) Sulfur dioxide.

§ 148.420 Flammable gas analyzers.

When Table 148.10 of this part associates a material with a reference to a paragraph in this section, each vessel transporting the material, other than an unmanned barge, must have on board a gas analyzer appropriate for the flammable gas listed in that paragraph. At least two members of the crew must be knowledgeable in the use of the equipment. The equipment must be maintained in a condition ready for use, capable of measuring 0 to 100 percent LFL for the gas indicated, and calibrated in accordance with the instructions of its manufacturer. The atmosphere in the cargo hold must be tested before any person is allowed to enter. If flammable gases are detected, the space must be ventilated and retested before entry. The flammable gases for which the requirements of this section must be met are:

- (a) Carbon monoxide;
- (b) Hydrogen; and
- (c) Methane.

§ 148.435 Electrical circuits in cargo holds.

During transport of a material that Table 148.10 of this part associates with a reference to this section, each electrical circuit terminating in a cargo hold containing the material must be electrically disconnected from the power source at a point outside of the cargo hold. The point of disconnection must be marked to prevent the circuit from being reenergized while the material is on board.

§ 148.445 Adjacent spaces.

When transporting a material that Table 148.10 of this part associates with a reference to this section, the following requirements must be met:

- (a) Each space adjacent to a cargo hold must be ventilated by natural ventilation or by ventilation equipment safe for use in an explosive gas atmosphere.
- (b) Each space adjacent to a cargo hold containing the material must be regularly monitored for the presence of the flammable gas indicated by reference to §148.420 of this part. If the level of flammable gas in any space reaches 30 percent of the LFL, all electrical equipment that is not certified

§ 148.450

46 CFR Ch. I (10–1–12 Edition)

safe for use in an explosive gas atmosphere must be de-energized at a location outside of that space. This location must be labeled to prohibit reenergizing until the atmosphere in the space is tested and found to be less than 30 percent of the LFL.

(c) Each person who enters any space adjacent to a cargo hold or compartment containing the material must wear a self-contained breathing apparatus unless—

(1) The space has been tested, or is routinely monitored, for the appropriate flammable gas and oxygen;

(2) The level of flammable gas is less than 10 percent of the LFL; and

(3) The level of toxic gas, if required to be tested, is less than the TLV.

(d) No person may enter an adjacent space if the level of flammable gas is greater than 30 percent of the LFL. If emergency entry is necessary, each person who enters the space must wear a self-contained breathing apparatus and caution must be exercised to ensure that no sparks are produced.

§ 148.450 Cargoes subject to liquefaction.

(a) This section applies only to cargoes identified in Table 148.10 of this part with a reference to this section and cargoes identified in the IMSBC Code (incorporated by reference, see §148.8) as cargoes that may liquefy.

(b) This section does not apply to—

(1) Shipments by unmanned barge; or

(2) Cargoes of coal that have an average particle size of 10mm (.394 in.) or greater.

(c) Definitions as used in this section—

(1) *Cargo subject to liquefaction* means a material that is subject to moisture migration and subsequent liquefaction if shipped with moisture content in excess of the transportable moisture limit.

(2) *Moisture migration* is the movement of moisture by settling and consolidation of a material, which may result in the development of a flow state in the material.

(3) *Transportable moisture limit* or *TML* of a cargo that may liquefy is the maximum moisture content that is considered safe for carriage on vessels.

(d) Except on a vessel that is specially constructed or specially fitted for the purpose of carrying such cargoes (see also section 7 of the IMSBC Code, incorporated by reference, see §148.8), a cargo subject to liquefaction may not be transported by vessel if its moisture content exceeds its TML.

(e) The shipper of a cargo subject to liquefaction must give the master the material's moisture content and TML.

(f) The master of a vessel shipping a cargo subject to liquefaction must ensure that—

(1) A cargo containing a liquid is not stowed in the same cargo space with a cargo subject to liquefaction; and

(2) Precautions are taken to prevent the entry of liquids into a cargo space containing a cargo subject to liquefaction.

(g) The moisture content and TML of a material may be determined by the tests described in Appendix 2, Section 1, of the IMSBC Code (incorporated by reference, see §148.8).

PART 149 [RESERVED]