

(2) Beams and girders extending below the ceiling of the space protected and any other obstructions do not detract from the effectiveness of the detector; and

(3) Damage to the detector is unlikely to occur if it is not protected.

(b) Each detector must be set to activate at not less than 57 °C (135 °F) and at not more than 73 °C (165 °F), except that if a space normally has a high ambient temperature each detector may be set to activate at not less than 80 °C (175 °F) and not more than 107 °C (225 °F).

**§ 108.409 Location and spacing of tubing in pneumatic fire detection system.**

(a) All tubing in a pneumatic fire detection system must be on the overhead or within 300 millimeters (12 inches) of the overhead on a bulkhead in a location where—

(1) No portion of the overhead is more than 3.6 meters (12 feet) from the nearest point of tubing;

(2) Beams or girders extending below the ceiling or other obstructions do not detract from the effectiveness of the tubing; and

(3) Damage to the tubing, is unlikely to occur if it is not protected.

(b) If tubing in a tubing circuit is installed in an enclosed space, at least 5% of the tubing in the circuit must be exposed in the space, except that at least 7.6 meters (25 feet) of tubing must always be exposed in the space.

(c) A pneumatic fire detection system must be set to activate after approximately a 22 °C. (40 °F.) per minute increase in temperature at the center of the circuit in the system.

**§ 108.411 Smoke detection system.**

Each smoke accumulator in a smoke detection system must be located on the overhead of the compartment protected by the system in a location—

(a) Where no portion of the overhead of the compartment is more than 12 meters (40 feet) from an accumulator;

(b) That is no closer to the opening of a ventilator than 3 times the diameter or equivalent size of the opening.

(c) Where damage to the accumulator is unlikely to occur if it is not protected.

**§ 108.413 Fusible element fire detection system.**

(a) A fusible element fire detection system may be installed.

(b) The arrangements for the system must be acceptable to the Commandant.

**FIRE MAIN SYSTEM**

**§ 108.415 Fire pump: General.**

A fire main system must have at least two independently driven fire pumps that can each deliver water at a continuous pitot tube pressure of at least 3.5 kilograms per square centimeter (approximately 50 pounds per square inch) at least two fire hose nozzles that are connected to the highest two fire hydrants on the unit. Alternative designs that meet the pressure requirement of this paragraph will be considered for column stabilized and self elevating units.

**§ 108.417 Fire pump components and associated equipment.**

(a) Each fire pump in a fire main system must have a relief valve on its discharge side that is set to relieve at 1.75 kilograms per square centimeter (approximately 25 pounds per square inch) in excess of the pump discharge pressure necessary to meet the pressure required in § 108.415 for the pump or 8.6 kilograms per square centimeters (approximately 125 pounds per square inch), whichever is greater. A relief valve may be omitted if the pump operating under shut off condition is not capable of developing the pressure described in § 108.415 plus 1.75 kilograms per square centimeter (25 pounds per square inch).

(b) Each fire pump in a fire main system must have a pressure gauge on its discharge side.

(c) Fire pumps may be used for other purposes. One of the required pumps must be kept available for use on the fire system at all times. If a fire pump is used in a system other than the fire main system, except for branch lines connected to the fire main for deck washing, each pipe connecting the other system must be connected to the pump discharge through a shut off valve at a manifold near the pump. If the fire pump exceeds the pressure in

## § 108.419

§108.417(a), the pipe leading from the discharge manifold to other portions of the fire main system must have a reducing station and a pressure gauge in addition to the pressure gauge required by paragraph (b) of this section.

(d) If a fire pump has a reducing station, the relief valve required by paragraph (a) of this section for the pump and the additional pressure gauge required in paragraph (c) of this section must not be located on the discharge side of the reducing station.

(e) An oil line must not be connected to a fire pump.

[CGD 73-251, 43 FR 56808, Dec. 4, 1978, as amended by CGD 95-028, 62 FR 51208, Sept. 30, 1997]

## § 108.419 Fire main capacity.

The diameter of the fire main must be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously.

## § 108.421 Location of fire pumps and associated equipment.

Each fire pump required by §108.415, and the source of power, controls, sea connections for the fire pump, and booster pumps, if installed, must be installed in locations where, if a fire occurs in an enclosed space, all of the fire pumps on the unit are not made inoperative, except that if compliance with this requirement is impracticable, a gas type extinguishing system may be installed to protect at least one of the fire pumps, its source of power, and controls.

## § 108.423 Fire hydrants and associated equipment.

(a) A fire main system must have enough fire hydrants so that each accessible space may be sprayed with at least two spray patterns of water.

(b) In a main machinery space, except a shaft alley with no assigned space for stowage of combustibles, each spray pattern of water must be from one length of fire hose and each must be from a separate outlet. In all other spaces at least one spray pattern of water must be from one length of fire hose.

(c) No outlet on a fire hydrant may point above the horizontal.

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(d) Each fire hydrant must have at least one spanner and at least one fire hose rack or reel.

## § 108.425 Fire hoses and associated equipment.

(a) Each length of fire hose in a fire main system must be—

(1) Of 1½ or 2½ inch nominal hose size diameter;

(2) Of 50 foot nominal hose size length; and

(3) Lined commercial fire hose that meets Standard 19 of the Underwriters' Laboratories, Inc., (1971 edition) or Federal Specification ZZ-H-451f.

(b) Fire station hydrant connections shall be brass, bronze, or other equivalent metal. Couplings shall either:

(1) Use National Standard fire hose coupling threads for the 1½ inch (38 millimeter) and 2½ inch (64 millimeter) hose sizes, i.e., 9 threads per inch for 1½ inch hose, and 7½ threads per inch for 2½ inch hose; or

(2) Be a uniform design for each hose diameter throughout the vessel.

(c) Each nozzle for a firehose in a fire main system must be a combination solid stream and water spray firehose nozzle that is approve under subpart 162.027. Combination solid stream and water spray nozzles previously approved under subpart 162.027 of this chapter may be retained so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(d) A combination solid stream and water spray firehose nozzle previously approved under subpart 162.027 of this chapter, must have a low-velocity water spray applicator also previously approved under subpart 162.027 of this chapter when installed in—

(1) Machinery spaces containing oil fired boilers, internal combustion machinery or oil fuel units; and

(2) Helicopter decks.

[CGD 73-251, 43 FR 56808, Dec. 4, 1978, as amended by CGD 95-027, 61 FR 26008, May 23, 1996; CGD 95-028, 62 FR 51208, Sept. 30, 1997]

## § 108.427 International shore connection.

A fire main system on a unit in international service must have—

(a) At least one international shore connection that meets ASTM F 1121