

Deck General – Safety

Fire Prevention And Firefighting Appliances

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What would be an example of a B-I extinguisher? (small passenger vessel regulations)

2 pound dry chemical

Illustrations: TABLE 181.500 PORTABLE FIRE EXTINGUISHER

See REF208

As seen in illustration D004SA below, what action must be taken before inserting a low-velocity fog applicator into an all-purpose nozzle?

remove the high-velocity nozzle tip

Illustrations: D004SA_WM_110218

Utilizing illustration D035SA below, the Master has ordered you to pull the remote ventilation shut down, where is it found?

Starboard side of the wheelhouse, frame 122

Illustrations: D035SA_WM_110218

In the view of the bridge deck on the fire control plan shown in illustration D035SA below, what is represented by the symbol on the aft bulkhead, port side of the wheelhouse?

Fire Alarm Panel

Illustrations: D035SA_WM_110218

In illustration D035SA below, viewing the bridge level of your vessel's fire control plan, what do the two symbols within the machinery casing represent?

CO2 and Halon protected spaces

Illustrations: D035SA_WM_110218

As seen in illustration D035SA below, when the remote push button located in the wheelhouse, starboard side, frame 122, is actuated, what is the result?

Ventilation ducts are secured

Illustrations: D035SA_WM_110218

There is an out of control fire on the Auxiliary Machinery Flat. Utilizing illustration D037SA below, what fixed extinguishing system in that space would be the best means to extinguish the fire?

Halon

Illustrations: D037SA_WM_110218

You are on the second deck in the main machinery space. Utilizing illustration D037SA below what emergency equipment, if any, is located at frame 107?

Fire main valve and 1 1/2" fire hose

Illustrations: D037SA_WM_110218

You are on the second deck of the engine room between frames 92 thru 105 and the space is filling up with smoke. Utilizing illustration D037SA below, where is the primary means of escape from that area is via a ladder well?

portside ladderwell, frame 106

Illustrations: D037SA_WM_110218

Using the vessel fire control plan in illustration D036SA below, what emergency equipment is located in the scullery?
Heat Detector

Illustrations: D036SA_WM_110218

Your vessel has suffered a casualty and is in danger of sinking. The Master orders abandon ship but a crew member is missing. You have located the crew member but she is trapped in the Steward's Office. Using the Fire Control Plans in illustration D036SA below, where is the nearest fire axe to gain entry?

Portside, Frame 132

Illustrations: D036SA_WM_110218

You are part of a team to overhaul a fire that was just extinguished in the crew lounge. Using the fire control plan in illustration D036SA below, where is the nearest fire axe to break apart the furniture?

Starboard side, frame 132

Illustrations: D036SA_WM_110218

In illustration D036SA below, what does the solid arrow in the Crew Mess represent on the Fire Control Plans?
primary means of escape

Illustrations: D036SA_WM_110218

Utilizing illustration D038SA below of the fire control plan of the lower engine room, what does the arrow between frames 135 and 140 represent?

Primary means of escape

Illustrations: D038SA_WM_110218

Utilizing illustration D038SA below a view of a vessel fire control plan, how many spaces are protected by a fixed CO2 extinguishing system?

2

Illustrations: D038SA_WM_110218

You are part of a search team and have been told that the wiper was last sighted next to the fire pump (s) in the lower engine room. Utilizing illustration D038SA below, what is the exact location of the fire pump(s)?

Machinery space, port side, frame 131

Illustrations: D038SA_WM_110218

You are being directed to a fire in the lower engine room, portside, frame 127. Utilizing illustration D038SA below, what machinery is found in that exact location?

Bilge pump(s)

Illustrations: D038SA_WM_110218

In illustration D039SA below, which fire control plan symbol designates a space or compartment protected by Halon 1301?
11

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

You must evacuate crewmembers from a space filling with smoke. The primary means of escape is blocked by the fire. What fire control plan symbol, in illustration D039SA below, designates the secondary means of escape?

62

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (67)?
emergency generator

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

Which piece(s) of equipment represented by the Fire Control Plan symbols in illustration D039SA below, can be found on the exterior of the vessel?

55

53

1

All of the above.

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents an emergency generator?

67

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a NON-portable extinguisher?

14

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what two fire control plan symbols designate the directional means of escape?

61 and 62

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, the halon room with the main battery of Halon 1301 bottles is designated by which symbol on the fire control plans?

10

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

On the fire control plans, in illustration D039SA below, the CO2 bottle room is designated by which symbol?

42

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (37)?
a fire alarm panel

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a fire alarm panel?

37

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol does NOT contain personal protective equipment?

30

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol is not part of the ship's foam system?

3

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

Which fire control plan symbol in illustration D039SA below represents the agent or device best suited for extinguishing a class "A" fire?

56

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (7)?
space protected by CO2

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

On fire control plans, in illustration D039SA, the dry chemical releasing station is designated by which symbol?

48

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

On the vessel's fire control plan, as seen in illustration D039SA below, which symbol helps to control the spread of fire?

32

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a space protected by foam?

16

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a bilge pump?

21

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol signifies equipment you would use if your fire pump(s) failed?

19

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

You must evacuate crewmembers from a space filling with smoke. In illustration D039SA below what fire control plan symbol designates the primary means of escape?

61

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (16)?
space protected by foam

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

On international voyages, tank ships of 500 gross tons or more, are required to have facilities to enable a connection on each side of the ship for which piece of equipment represented in illustration D039SA below?

53

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

On the vessel's fire control plan, as seen in illustration D039SA below, which symbol represents a fire damper?

32

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a fire pump?

54

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents the best means to extinguish a Class Alpha fire?

23

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which fire control plan symbol(s) represents the agent or device best suited for extinguishing a class "B" fire?

16 and 36

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (56)?

water fog applicator

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

Symbol number (51) in illustration D039SA below is found all throughout the ship. What fire control equipment does this symbol represent?

Fire main with fire valves

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

Which fire control plan symbol, in illustration D039SA below, represents a dry chemical delivery method for small scale fires?

47

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a heat detector?

49

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents the best means to extinguish a LARGE Class Bravo fire?

14

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which fire control plan symbol represents the agent or device best suited for extinguishing a class "C" fire?

26

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (39)?
sprinkler

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, a complete recharge for a self-contained breathing apparatus can be found in what location designated by this symbol on the ship's fire control plan?

58

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

As seen in illustration D039SA below a complete set of spare batteries for a fireman's outfit can be found in what location designated by this symbol on the ship's fire control plan?

58

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents an emergency fire pump?

19

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a fire main with fire valves?

51

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below the location of a spare set of fire control plans on board the vessel is designated by what approved symbol?

1

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (64)?
inert gas installation

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

As seen in illustration D039SA below, a locker with additional breathing apparatuses can be found in what location designated by this symbol on the ship's fire control plan?

59

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents an international shore connection?

53

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a fire station?

30

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents equipment NOT to be found immediately outside the engine room?

12

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol(s) represent part of the vessel's ventilation system?

69

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, what is the fire control plan symbol represented by number (30)?

fire station

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

As seen in illustration D039SA below a locker with additional protective clothing can be found in what location designated by this symbol on the ship's fire control plan?

58

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents a push button for a fire alarm?

2

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents the direction of primary means of escape?

61

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

In illustration D039SA below, which Fire Control Plan symbol represents equipment that is MOST likely to be found in the ship's galley?

49

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

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space protected by foam

Illustrations: D039SA1_WM_072020, D039SA2_WM_072020

SPANNER : A form of open-head wrench for use with special fittings whose character is such as to preclude the use of the ordinary type of wrench.

REF187

The fire main system provides water to the fire hose and through the hose to the nozzle. The only type of nozzle allowed on an inspected vessel is the Coast Guard "approved" all-purpose or combination nozzle. The combination nozzle provides a solid stream of water with the handle or "bail" pulled all the way back or high velocity fog with the bail in the "fog" or middle position. The forward position of the bail shuts off the water flow. However, the nozzle is hard to control when shifting to the solid stream position with the bail pulled back .

REF188

46 CFR § 76.10-10 Firehoses must be connected to the outlets at all times. However, on open decks where no protection is afforded to the hose in heavy weather, or where the hose may be liable to damage from the handling of cargo, the hose may be temporarily removed from the hydrant and stowed in an accessible nearby location.

REF189

The first step in fighting a Class C fire is to secure (i.e., turn off) electrical power to the equipment or circuits on fire. Class C fires are those in or around electrical equipment, gear, or wiring. The reason these fires are placed in a separate class is because they add the danger of electrical shock to persons in the area. Water-based agents cannot be used on this type of fire because water conducts electrical current. However, low velocity fog can be used .

REF190

The all-purpose nozzle produces water as a solid stream or as a wide fog. Using the back hand, pushing the handle all the way forward shuts off the water flow. Pulling it back until it is perpendicular to the hose produces wide fog, while pulling it back until it is in line with the hose produces a solid stream. Vari-tip nozzles can be adjusted from straight stream to wide fog by twisting the tip. While the vari-tip nozzle provides an infinitely adjustable discharge pattern, it is more likely than the all-purpose nozzle to be clogged by debris. The all-purpose nozzle can pass debris up to a quarter-inch in diameter through either fog or stream tips. The applicator produces low velocity fog. It can be fitted to the all-purpose nozzle after removal of the spud tip. The applicator is used for indirect fire fighting. It can be inserted through a door or hatch to discharge low velocity fog, or used to protect other personnel from radiant heat. The fixed deck monitor discharges large volumes of water.

REF191

The most effective method of fighting a Class A fire is by quenching and cooling it with water. Be careful because a fire hose under pressure is difficult to control especially when changing from shut (handle forward) to solid stream (handle all the way back). When using a wye "Y" gate to feed two hoses, each line can be turned on or off by turning the valve 90° on each leg. To prevent a Class A fire from spreading by conduction through steel, spray water fog on all exterior surfaces (including top and bottom) until no more steam is produced. Repeat the procedure as often as necessary . Class A includes fires in solids such as paper, canvas, wood, rubber, etc. You normally fight these fires by removing the heat by cooling or quenching. The most common agent used in fighting this type of fire is water in its various forms. You should fight fires in mattresses and bedding materials with a solid stream of water. This breaks up the bedding material and allows the water to reach deeply embedded pockets of combustion. A "solid stream" of water also has the greatest "reach" or effective distance when you cannot get close enough to the fire to be effective with other agents . High velocity fog is a better cooling agent than solid stream water. Use it when you do not need a long reach or the "breaking-up force" of a solid stream . On large fires on an open deck, Aqueous Film Forming Foam (AFFF), also known as "light water," is best suited when it is available. FOG is effective when used in closed spaces. High velocity fog has a longer reach than low velocity fog. However, low velocity fog is a better heat absorber and often is used as a heat shield for firefighters.

REF192

46 CFR 92.07

REF193

Battery rooms must be ventilated since lead-acid batteries produce hydrogen gas which is explosive. When charging, remember that hydrogen is a highly explosive gas that rises above the batteries and may be trapped beneath the overhead.

REF194

Class A includes fires in solids such as paper, canvas, wood, rubber, etc. You normally fight these fires by removing the heat by cooling or quenching. The most common agent used in fighting this type of fire is water in its various forms. You should fight fires in mattresses and bedding materials with a solid stream of water. This breaks up the bedding material and allows the water to reach deeply embedded pockets of combustion. A "solid stream" of water also has the greatest "reach" or effective distance when you cannot get close enough to the fire to be effective with other agents. High velocity fog is a better cooling agent than solid stream water. Use it when you do not need a long reach or the "breaking-up force" of a solid stream. On large fires on an open deck, Aqueous Film Forming Foam (AFFF), also known as "light water," is best suited when it is available. FOG is effective when used in closed spaces. High velocity fog has a longer reach than low velocity fog. However, low velocity fog is a better heat absorber and often is used as a heat shield for firefighters.

REF195

Class B fires refer to fires in liquids. These fires are most commonly extinguished by smothering or blanketing. This cuts off the supply of oxygen to the fire. Breaking the chain reaction is also used on Class B fires. Water fog can be used as well on Class B fires.

REF196

Heat is transferred in three (3) ways: 1. Conduction through solids structural members such as decks and bulkheads that should be cooled to control the fire. 2. Convection through fluids such as liquids and gases. Since hot air rises, this hot air moves through a vessel's ventilation system and stair towers. Stop the ventilation and close doors and dampers to prevent spreading the fire. Fusible links automatically melt and close some fire dampers. 3. Radiation, similar to the sun's ability to heat the earth through 93,000,000 miles of empty space.

REF197

If heavy smoke is coming from a paint locker's partially open door, shut the door and all vents and manually release the fixed CO₂

REF198

The Station Bill 46 CFR 199.80 46 CFR 108.901 The Station Bill (now called a Muster List) lists your emergency station and also which lifeboat or life raft you are assigned to. You are required to read the Muster List as soon as you report aboard ship. The signal for "boat stations" (i.e., preparing to launch lifeboats and inflatable life rafts to abandon ship) is more than six short blasts and one long blast on the whistle followed by the same signal on the general alarm bells. When you hear this signal, go to your assigned station. A continuous blast of the whistle for at least 10 seconds and the same signal on the General Alarm bells is the fire and emergency signal. When you hear this signal, go to your fire station. If you are on watch in the engine room, start the fire pump and supply water under pressure to the fire main. During drills, one short blast of the whistle signals the crew to lower the boats. Two short blasts means to stop lowering the boats. Three short blasts is the signal to dismiss the crew from the drill. Additional emergency signals are assigned by the Master. Emergency duties must be comparable to regular duties.

REF199

Overhaul means opening walls, ceilings, voids, and partitions to check for fire extension in both the precontrol and postcontrol phases of firefighting operations. ... Once on the scene, pumped-up firefighters seem to run on autopilot until the fire is extinguished, rescues are made, and the fire is under control.

REF200

Reference: Marine Fire Prevention, Firefighting and Fire Safety, Maritime Administration, page 202. "An indirect attack is employed when it is impossible for firefighters to reach the seat of the fire." The incorrect choices represent a direct attack on a fire.

REF201

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REF202

Spontaneous combustion or spontaneous ignition is a type of combustion which occurs by self-heating (increase in temperature due to exothermic internal reactions), followed by thermal runaway (self heating which rapidly accelerates to high temperatures) and finally, autoignition. Spontaneous combustion can occur when a substance with a relatively low ignition temperature (hay, straw, peat, etc.) begins to release heat. This may occur in several ways, either by oxidation in

the presence of moisture and air, or bacterial fermentation, which generates heat. The heat is unable to escape (hay, straw, peat, etc. are good thermal insulators), and the temperature of the material rises. The temperature of the material rises above its ignition point (even though much of the bacteria are destroyed by ignition temperatures). Combustion begins if sufficient oxidizer, such as oxygen, and fuel are present to maintain the reaction into thermal runaway.

REF203

Convective heat transfer, often referred to simply as convection, is the transfer of heat from one place to another by the movement of fluids. Convection is usually the dominant form of heat transfer in liquids and gases.

REF204

Class B fires refer to fires in liquids. These fires are most commonly extinguished by smothering or blanketing. This cuts off the supply of oxygen to the fire. Breaking the chain reaction is also used on Class B fires. Water fog can be used as well on Class B fires. Foams extinguish a fire by smothering or blanketing it and thereby removing the oxygen. Secondly, foam also cools a fire. A portable foam extinguisher is likely to freeze since it is filled with a water solution. This is one reason why most of these units were removed from service. This type of extinguisher is used mostly on Class B fires but also can be used on Class A fires. A foam fire extinguishing agent must never be used on a Class C fire since its extinguishing agent has a water base and conducts electricity. Class B fires refer to fires in liquids. These fires are most commonly extinguished by smothering or blanketing. This cuts off the supply of oxygen to the fire. Breaking the chain reaction is also used on Class B fires. Water fog can be used as well on Class B fires.

REF205

Fires are divided into five different "classes"- A, B, C, D, and LFG. These classes indicate either the type of fuel involved or special dangers. The class also indicates the type of extinguishing agent to use and certain techniques that should or should not be used on that fire. The first step in fighting a Class C fire is to secure (i.e., turn off) electrical power to the equipment or circuits on fire. Class C fires are those in or around electrical equipment, gear, or wiring. The reason these fires are placed in a separate class is because they add the danger of electrical shock to persons in the area. Water-based agents cannot be used on this type of fire because water conducts electrical current. However, low velocity fog can be used.

REF206

Class A fire: A fire involving common combustible materials which can be extinguished by the use of water or water solutions. Materials in this category include wood and wood-based materials, cloth, paper, rubber and certain plastics. Class B fire: A fire involving flammable or combustible liquids, flammable gases, greases and similar products. Extinguishment is accomplished by cutting off the supply of oxygen to the fire or by preventing flammable vapors from being given off. Class C fire: A fire involving energized electrical equipment, conductors or appliances. Nonconducting extinguishing agents must be used for the protection of firefighters. Class D fire: A fire involving combustible metals, for example, sodium, potassium, magnesium, titanium and aluminum. Extinguishment is accomplished through the use of heat absorbing extinguishing agents such as certain dry powders that do not react with the burning metals.

REF207

Class D fires: Burning metals, such as magnesium, sodium, potassium, and aluminum constitute Class D fires. Since most ships usually are not equipped to fight this type of fire, allow these fires to burn out while you protect the surrounding area.

REF208

181.500 Required number, type, and location.

REF209

Subpart D—Fixed Fire Extinguishing and Detecting Systems (iii) Controls shall be installed in an accessible location outside the space protected.

REF210

Subpart D—Fixed Fire Extinguishing and Detecting Systems § 181.400 Where required. (a) The following spaces must be equipped with a fixed gas fire extinguishing system, in compliance with §181.410, or other fixed fire extinguishing system specifically approved by the Commandant, except as otherwise allowed by paragraph (b) of this section: (1) A space containing propulsion machinery; (2) A space containing an internal combustion engine of more than 37.3 kW (50 hp); (3) A space containing an oil fired boiler; (4) A space containing machinery powered by gasoline or other fuels having a flash point of 43.3 °C (110 °F) or lower;

REF211

Subpart F—Additional Equipment § 181.600 Fire axe. A vessel of more than 19.8 meters (65 feet) in length must have at least one fire axe located in or adjacent to the primary operating station.

REF212

Carbon dioxide (CO₂) is a gas used to extinguish fires by smothering them. It can be used on Class A fires although it is considered primarily a Class B and Class C fire extinguishing agent. CO₂ is heavier than air and forms a "blanket" over a liquid surface. This "blanket" keeps the oxygen in the air from reaching the flames and fumes. A break in the CO₂ "blanket" smothering a fire will allow the fire to rekindle (i.e. .. restart) if the fuel has not cooled below its auto-ignition temperature.

REF213

Dry chemical extinguishers must be recharged after each use. A cartridge-operated dry chemical extinguisher can be recharged aboard ship . If the seal over the cartridge is broken, the cartridge must be replaced. Also, check to see that the hose and nozzle are clear and that the powder has not caked. To recharge, replace powder and change the CO₂ cartridge. For a stored pressure type dry chemical extinguisher check the pressure gauge to determine the state of the charge.

REF214

46 CFR § 132.350

REF215

46 CFR 108.455(a) 46 cfr part 95 fire protection equipment.pdf.15-35(a)

REF216

46 cfr part 95 fire protection equipment.pdf.15-10(d)

REF217

46 cfr part 95 .15-10(e) (e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control. When the system is activated an alarm sounds in a manned space for about 20 seconds before CO₂ gas floods that space. You must leave the space immediately when this alarm sounds to avoid being overcome by the CO₂ gas because CO₂ will not support human life. The CO₂ alarm for a CO₂ flooding system is powered by CO₂ pressure .

REF218

46 cfr part 95 fire protection equipment.pdf.15-20(b) When the system is activated an alarm sounds in a manned space for about 20 seconds before CO₂ gas floods that space. You must leave the space immediately when this alarm sounds to avoid being overcome by the CO₂ gas because CO₂ will not support human life. The CO₂ alarm for a CO₂ flooding system is powered by CO₂ pressure .

REF219

46 cfr part 95 fire protection equipment.pdf.15-10(e) Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

REF220

Water is the most common and safest fire fighting agent. It vaporizes and expands rapidly as it absorbs heat and cools the fire .

REF221

Class A includes fires in solids such as paper, canvas, wood, rubber, etc. You normally fight these fires by removing the heat by cooling or quenching. The most common agent used in fighting this type of fire is water in its various forms. The most effective method of fighting a Class A fire is by quenching and cooling it with water. Be careful because a fire hose under pressure is difficult to control especially when changing from shut (handle forward) to solid stream (handle all the way back). When using a wye "Y" gate to feed two hoses, each line can be turned on or off by turning the valve 90° on

each leg. To prevent a Class A fire from spreading by conduction through steel, spray water fog on all exterior surfaces (including top and bottom) until no more steam is produced. Repeat the procedure as often as necessary .

REF222

An oxygen Indicator is a device that tests for oxygen content. Prolonged exposure to gases such as CO₂ may affect its accuracy .

REF223

Ambient air typically consists of 78% nitrogen and 21% oxygen. The extra 1% is a combination of carbon, helium, methane, argon and hydrogen. The closer the air is to sea level, the higher the percentage of oxygen. Human activities, particularly the manufacturing processes and the burning of fossil fuels, has directly impacted the ambient air quality due to the high level of industrial and chemical pollutants that have been released into the atmosphere.

REF224

Use a combustible gas indicator to test for the presence of explosive gases. These meters show the percentage (%) of the lower explosive limit (LEL) of a combustible gas in any given space. However, a combustible gas indicator only detects vapor at the point where the sample is taken. It will not work properly in oxygen-deficient atmospheres. Any movement of the needle indicates an unsafe condition. Petroleum vapors are normally heavier than air and settle at the lowest point in a tank or compartment. Be sure to test the atmosphere in those locations . An oxygen Indicator is a device that tests for oxygen content. Prolonged exposure to gases such as CO₂ may affect its accuracy .