Chapter 15-4

Standard Operating Guideline for

Effective 1-5-05 **Fire Extinguisher Use and Maintenance** rev. 12/06/04

1. Purpose

This SOG details how PVFD will use and maintain its fleet of fire extinguishers, to meet the intent of NFPA 10.

2. Scope

This SOG applies to all PVFD personnel who have been trained to use fire extinguishers.

3. Definitions

-Agent = The material contained in an extinguisher that is applied to a fire.

-ABC agent = Monammonium Phosphate powder, with silica added to make the agent flow freely. This agent has a yellowish color.

-BC agent = Sodium Bicarbonate powder, with silica added to make the agent flow freely. This agent is bright white.

-CO_2 = Carbon Dioxide. This agent is a pressurized gas that stores in liquid form. When it is discharged, CO_2 returns to the gas state, cooling very rapidly. CO_2 is a simple asphyxiant, meaning it physically displaces oxygen in the air. CO_2 extinguishes fire by cooling and smothering it. It is also electrically non-conductive, so it can be used on class C fires. CO_2 dissipates quickly unless it is discharged into an enclosed space. Since it is heavier than air, it can accumulate in low-lying enclosures.

-Dry Chemical = ABC or BC agent

-Dry Powder = An agent, in powder form, used to extinguish fires in combustible metals (class D fires). Met-L-X is the most common brand of dry powder. Dry powders are usually composed of salts.

-Halon (or halogenated agent) = A group of agents that are made of a chemical mixture that displaces oxygen. Halon 1211 and 1301 were once the most popular types (the number refers to the chemical composition of the agent). Halons are being removed from use because they deplete the ozone layer and produce toxic by-products when used to extinguish fire. Halons leave no residue, so they are useful on electronics or other sensitive equipment. There are other agents being developed to replace Halon. FM-200 and Inergen are now the most common Halon replacement agents. These agents are found in fixed systems for enclosed computer or electronic labs, and occasionally in portable fire extinguishers. Special care must be taken to avoid breathing by-products from a fire extinguished with Halons.

-Pressurized-at-use = An extinguisher that has the agent stored in a non-pressurized container, and a CO_2 cartridge attached to it. The extinguisher is activated when the user discharges the CO_2 cartridge into the agent container. The extinguisher's discharge hose has a valve on the end that allows the user to aim, start, and stop the agent flow.

-Stored pressure = An extinguisher that has a pressure charge inside the agent

container at all times. In PW, foam, or class K extinguishers, the charge is 100 psi air pressure. In dry chemical or dry powder extinguishers, the charge is nitrogen or Class D breathing air, usually at 195 psi. In CO_2 extinguishers, the agent is compressed to 1800 psi. A pressure gauge is mounted on all stored pressure extinguishers except CO_2 to show that the extinguisher is charged. CO_2 extinguishers must be weighed to verify they are fully charged.

-Pressurized Water (PW) = An extinguisher with a stainless steel (silver) shell that contains 2½ gallons of water under pressure.

-Foam extinguisher = An extinguisher that contains a mixture of water and foam as its agent. Any foam extinguisher that PVFD would have would be a PW that has AFFF or F-500 foam concentrate added. An air aspirator may also be attached to the end of the discharge hose.

-Wet Chemical = Potassium Acetate agent, class K extinguisher. This agent is stored in an extinguisher that looks like a PW, but has a wand with a head that produces a mist. Wet chemical agent is used for cooking oil fires, especially commercial deep fryers.

4. Background

PVFD has a fleet of portable fire extinguishers for use in emergency response and for general fire safety. Use of fire extinguishers as part of a fire department response requires the same techniques and precautions as if a civilian was using the extinguisher. Firefighters who may use an extinguisher in a civilian setting must not forget their limitations, since they will not have protective clothing or a back-up crew present.

All extinguishers owned by PVFD shall be marked "PVFD #" near the top of the body of the extinguisher. Extinguishers assigned to apparatus shall also have the unit number written on them. Extinguishers shall also have the date of manufacture and the last hydro-test date written on the front, bottom of the extinguisher body.

The Fleet Supervisor keeps a master list of all PVFD extinguishers. The list shows the extinguisher location, type, PVFD number, and hydro test dates.

5. Classes of Fire

Fire Class	Type of material burning	Proper extinguishing agents
A	Ordinary Combustibles (wood, paper, plastics)	Water, ABC dry chemical Foam,
B	Flammable Liquids	ABC or BC dry chemical Foam, CO_2,
C	Energized Electrical Equipment	ABC or BC dry chemical CO_2, Halons, remove power
D	Combustible Metals	Dry powder, cover in dirt
K	Cooking Oils & Fats	Wet chemical

6. Use of Fire Extinguishers

Civilian Use of Extinguishers

If an extinguisher is to be used in a civilian setting (fire dept. is not on scene), or by a civilian, the following steps should be followed:

1. Notify all people present that there is a fire. Pull fire alarm box if present. Assign someone to call the fire department. If no other person is present, call the fire department BEFORE using a fire extinguisher.

2. Make sure the building is being evacuated.

3. Obtain a fire extinguisher. Make sure it is ready for service, and is the proper type of extinguisher for the fire class.

4. Make sure you have a clear escape path behind you. Approach the fire and use the PASS method to extinguish the fire.

Pull the pin, and test the extinguisher to make sure it works.

Aim the extinguisher at the base of the fire.

Squeeze the valve handle to discharge the agent.

Sweep the stream across the base of the fire.

When the fire is out, or the extinguisher is empty, *back away* from the fire in case it flares up. If one extinguisher does not control the fire, abandon the fire and exit the building, shutting any doors behind you.

<u>Alternate Extinguishing Methods/Agents for Kitchen Fires</u>

Fires occurring on stovetops can be extinguished successfully with the following home remedies:

-Cover the pan with a lid and LET IT SIT! Moving a burning pan is extremely dangerous.

-Pour a copious amount of baking powder or salt onto the fire.

NEVER USE FLOUR OR SUGAR to extinguish a fire. They are combustible, and can cause the fire to flare up or explode if conditions are right.

<u>Fire Department Use of Extinguishers</u>

If a fire extinguisher is used by a firefighter as part of a fire response, use the following steps:

1. Advise other companies of the type, size, and location of the fire.

2. Make sure the building is being evacuated, and provisions are made to back up the fire extinguisher attack with a handline if necessary.

3. Select the proper type of extinguisher for the class of fire.

4. Make sure you have a clear escape path behind you. Approach the fire and use the PASS method to extinguish the fire.

Pull the pin, and test the extinguisher to make sure it works.

Aim the extinguisher at the base of the fire.

Squeeze the valve handle to discharge the agent.

Sweep the stream across the base of the fire.

When the fire is out, or the extinguisher is empty, *back away* from the fire in case it flares up. If one extinguisher does not control the fire, back out and shut the door. Prepare for a handline attack.

7. Inspection, Maintenance, and Service Intervals

Inspection

All fire extinguishers assigned to apparatus shall be inspected any time the apparatus is inspected, but no less than once per month. Station extinguishers shall be inspected on the first Wednesday of each month. Inspection consists of checking for the following:

-Extinguisher is present, clean, and undamaged
-Tamper tag and pull pin are in place, and gauge shows full

Annual Maintenance

All fire extinguishers shall undergo "maintenance" annually. Maintenance consists of checking the following items:

-Extinguisher is present, clean, and undamaged
-Tamper tag and pull pin are in place, and gauge shows full
-On dry chemical or dry powder units, invert the extinguisher to fluff the agent
-The extinguisher is not out of date for hydro-test or 6 year service
-Service tag is marked to show date of last annual maintenance

Service

Carbon Dioxide: CO_2 extinguishers are hydro-tested every five years. They are also tested for electrical non-conductivity through the hose and horn assembly. The tester will affix a tag to the hose to verify the electrical test.

PW (or any other extinguisher with a stainless steel shell): are hydro-tested every 5 years.

All other extinguishers: ABC, BC extinguishers have mild steel shells that must be hydro-tested every 12 years. Stored pressure dry chemical or dry powder extinguishers must undergo a "dump test" every 6 years to make sure the agent will expel properly. After this test, the valve assembly is rebuilt and the extinguisher is recharged.