WHY DO WE DO THAT?
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BY FRANK C. MONTAGNA

A GOOD WAY TO ENSURE OPERATIONS ARE CARRIED out the way you want them executed is to make sure that everyone knows why you want the task done a certain way. Knowledge helps keep everyone on the fireground safer, so pass on your knowledge, and learn from those who know.

We are told to flush the hydrant before hooking up to it. Why?

Debris can work its way into the water system and become lodged in the barrel of the hydrant, or someone may have placed the debris there intentionally. The latter, which may seem unlikely to you, is common in some areas. Mischievous or malicious people stuff balls, beer or soda cans, drug paraphernalia, and just plain garbage into hydrant barrels. If the debris is not flushed out of the hydrant before hooking up to it, serious water-flow problems can result.

A plastic bag in the hydrant can become lodged against the pumperôs intake, effectively sealing the opening and preventing water from reaching the pumps, or it may partially seal the opening and prevent adequate water flow.

A defective or missing screen on the intake may allow debris to enter the pumps and causing serious damage.

Another reason to flush the hydrant before hooking up is to determine if the hydrant is working properly. Is water supplied to the hydrant? Does the operating nut work? Actually seeing water flow from the hydrant onto the street lets the pump operator know that the hydrant is not dry. Not verifying this fact could result in a serious delay in supplying water to the hoseline. If booster tank water is supplied initially, hooking up to a dry hydrant will result in water loss once the tank is dry. Imagine your attack team pushing into a serious fire on booster water, only to suddenly have the tank run dry and the water cut off. The same result could occur if debris were left in the hydrant and it blocked the intake opening. The solution to the dry hydrant and the debris problem is simple. Flush the hydrant before hooking up to it.

Flushing the hydrant. How do you flush the hydrant? First, do not open it quickly. When you open the hydrant quickly, a large volume of water suddenly rushes through the hydrant and out the hydrant nozzle. This sudden violent action could force the debris upward to the top of the barrel, trapping it there instead of forcing it out of the hydrant. After you shut down the hydrant, hook up and open the hydrant again; the debris may work its way into the hose, lodge against the intake screen, and block the flow of water. Instead, rotate the hydrantôs operating nut several times to open the hydrant gently out of the hydrant barrel. This way, instead of pushing the debris against the top

of the hydrant barrel and trapping it there, the water will push it up and out of the hydrant onto the street.

Unblocking the hydrant. You may be made aware that the hydrant is blocked by debris by your officerôs telling you that he has no identify this problem beforehand if you check the hydrant pressure gauge. If the hydrant is blocked, the pressure gauge would show inadequate or no water pressure and your flowmeter would show no flow or an inadequate flow of water.

The first step to remedy this situation would be to check to see if your gated inlet is open. A closed inlet would give you the same results as a blocked inlet, but it is easier to remedy. Just open it.

If the intake gate is open and water still is

Å If you are not already water to your hoseline, begin supp

Å Immediately notify your officer of the situ water supply or that his water supply will be cut off after the booster tank runs out.

Å Shut down the hydrant supplying your pumper with water at the h the pumper inlet.

Å Clear the debris from the screen.

Å If you are unable to clear the screen, conn pumperôs inlets.

Å Reconnect the supply hose, and start water.

If you are unable to resolve your water supply problems, you may have to stretch a supply line from a different hydrant to your pumper; another engine may have to hook up to a fire hydrant and relay water to you or break and supply the hoseline stretched by your company. A cool head and prior training will make these options go smoothly. (Thanks to the Fire Department of New Yorkôs reference material and advice used in preparing this item.)

We are told not to put water on a liquefied natural gas (LNG) leak. Why not?

LNG is a flammable, cryogenic liquefied gas. We know what a flammable gas is, but do we know what a cryogenic liquefied gas is? A cryogenic liquefied gas is one that has been converted to a liquid by cooling, compression, or both. LNG boils at about -260°F. The gas utility stores LNG in insulated cylindrical, double-walled, domed-roof storage tanks. These tanks are pressurized to less than 5 psig. LNG stays at near constant temperature when stored at a constant pressure. It is stored at its boiling point for the pressure at which it is contained. Boil-off constantly occurs, and this gas is allowed to

leave the tank. This process is known as vaporization. As long as the gas is allowed to leave the tank, the temperature remains constant.

LNG is natural gas and composed principally of methane with lesser amounts of ethane, butane, and propane. In its liquid state, LNG fits into a space 1/600th as large as it is in the gaseous state. When it is heated to above boiling and not confined, it will expand 600 times as it converts to a gas state. LNG is used to augment the supply of natural gas during times of high demand, a process known as peak shaving.

LNG converts from a liquid to a gas at temperatures above its boiling point, which means ambient temperature will convert it to a gas state. While LNG converts to gas at ambient temperatures, a large spill will pool and off-gas as the pool warms. Depending on the size and depth of the spill, this process could take hours. Applying water to this pool will speed up the warming process and actually accelerate the conversion of LNG to a gas, increasing the amount of gas vapor released and the size of the vapor cloud.

Water can be used to direct the vaporizing gas away from structures and ignition sources, but be careful that the runoff does not find its way back to the spill. Adding water to the spill will not only increase the speed of the conversion of the liquid to a gas, but it may also increase the area of the leak. LNG will float on top of the water and can flow with the water to previously uninvolved areas, spreading the vaporizing gas as the liquid spreads.

Another problem associated with applying water to an LNG spill is that if the water spray contacts a properly functioning LNG pressure relief valve, the escaping cold gas could cause the water to freeze and thereby freeze the relief valve. A frozen relief valve will no longer function and will not allow the gas to escape. The result will be excess pressure and possibly failure of the LNG container. Use a fog stream to disperse the gas cloud, to direct it away from life and property and to protect exposures, but be careful that the water runoff does not contact the pool of LNG or an operating relief valve. It will only make things worse.

We are cautioned not to cut gypsum roofs. In fact, we are warned not to operate over a fire on a gypsum roof. Why not?

To answer this, I must first describe a gypsum roof. There are two main types. One type, found only on flat roofs, is poured in place over a wire mesh. The other type is made up of precast gypsum planks and is typically found on roofs with a slight pitch.

Gypsum planks are typically two inches thick, two feet wide, and up to eight feet long. Factory made, the planks consist of two gypsum panels laminated together and weigh about 135 pounds. Poured-in-place gypsum is two inches thick and weighs about 17½ pounds per square foot. Both types are covered with waterproofed roofing material; as a result, it will not be obvious to firefighters on the roof that they are standing on a gypsum roof.

The problems with this type of roofing material. Gypsum roofing presents a numbeer of problems for firefighters.

Å It is susceptible to damage. A leak in the roof can, over time, cause the gypsum under the roof surface to deteriorate until there is practically no material under the roofôs surface for some distance around the roof, and an unwary firefighter could fall through the damaged portion of the roof.

Å Gypsum roofing material is heavy. Remember, poured gypsum weighs 171/2 pounds per square foot. A cut piece falling onto firefighters below could seriously injure them.

Å Gypsum roofing is typically installed over subject to the early collapse hazards of the truss supporting it.

Å The end joints of each plank are staggered supported by joists or trusses. Cutting a hole in the roof could leave you standing on an unsupported plank end.

Å Cutting a hole in poured gypsum is also dan weight at the edge of a roof cut could cause an unsupported edge to crack and drop the firefighter into the fire below.

Operating on these roofs. Donôt. If there is a serious fire we already know we should not be cutting the roof. Unfortunately, we may not know that the roof is a truss and we may not know that it is a gypsum roof. Although it is not obvious from the roof level, you might be able to identify gypsum roofing from inside the building before you respond to a fire. You definitely should note the presence of gypsum roofing in your preplan.

When cutting a gypsum roof with a power saw, you will see a telltale white powder cloud being kicked up from the cut. This is an indication that the roof is gypsum and not wood. If you observe this danger sign, stop cutting the roof, notify the incident commander that the roof is gypsum, and get off the roof.

Be aware that it is not always easy to identify a gypsum roof. A gypsum roof damaged by moisture may not cause the white powder to form. Instead, mud- or clay-like wet gypsum may clog the shroud of the saw.

At a fire in a one-story commercial building, the firefighter cutting the roof notified me that he saw white powder as he cut the roof and that the roof was gypsum. I ordered all firefighters off the roof and warned the advancing engine company to use the reach of its stream to keep the crew out from under the roof in the fire area. I was concerned that its hose stream might further damage the roofing material and that some of it might fall in on them.

At the conclusion of the fire, we investigated the construction of the roof and found it was not gypsum but metal deck covered with layers of rigid foam insulation covered over with tarpaper. The white cloud reported by the firefighter was pulverized white foam insulation, not gypsum. The firefighter was mistaken, but we erred on the side of caution. No harm was done, no one was hurt, and the fire went out.

After another fire, we discovered a gypsum roof was present. A hole in the roof had been cut because the firefighter on the roof did not realize he was cutting gypsum. Again, the fire went out, and no one was hurt. We went back the next day to drill at the site and found the roof being repaired with rigid foam insulation cut to the size of the hole and tarred over, making a perfect booby trap for the next firefighter walking on the roof.

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