Foam and Flammable Liquids

Flammable Gas and Foam

Objectives: (NFPA 1001 5.3.3(B) and 5.3.1(B)

- Ability to assemble a team
- Ability to execute effective advance and retreat of hose lines
- Ability to apply various techniques for water applications
- Ability to assess cylinder integrity and changing cylinder condition
- Operate control valves
- Able to choose effective procedures when conditions change
- Ability to prepare a foam concentrate
- Ability to assemble foam stream components
- Apply various foam application techniques
- As a team approach and retreat from spills as part of a coordinated team

Equipment:

- Propane cylinder props
- Foam concentrate
- Foam inductor and nozzles
- 150' of 1 ¾" hose line

Instructors:

One Lead; Two flammable Gas instructors and one foam instructor

Support Staff:

- Engine Operator
- Air Operator
- EMS
- Drill Master
- Propane prop operator

Time:

8 hours

Instructions

The lead instructor shall have the students assemble into teams of six (6) (Group A, Group B, Group C, and Group D). Groups A and B will be assigned Flammable Gas while Group C and D are assigned Foam. Once everyone completes there assignments the groups will rotate.

Flammable Gas Group:

The Flammable Gas groups will complete tank cooling, flame impingement and valve shut-off procedures. Two 1-3/4" hose-lines will be used for attack (One on nozzle, two back up, and one hose tender). The other four will stage ready to rotate.

All personnel will be in full PPE and SCBA and on air, except for the hose line tender who does not have to be "on air" and should be out of the danger zone feeding hose-line as the hose-line progresses or retreating.

There will be a "Dry Run" prior to any live fire conditions. This "Dry Run" will help the student understand the "half-step" method of advance and will show how the nozzle is to be held and adjusted as the hose-line advances. It is important to flow water during this "Dry Run". A few practice runs maybe needed to get the rhythm down.

There will be an instructor between the two (2) attack hose-lines, the instructor will place his hands on the shoulders of each nozzle person, and the instructor will "squeeze" a nozzle person's shoulder which will indicate who he is speaking to. One attack line will be centered on the tank and the other hand line will be place at the flame impingement point.

The nozzle person will check the appropriate fog pattern prior to "Going In" and will hold the nozzle at the proper height with one hand on the nozzle so to be able to make fog pattern adjustments.

When the instructor is ready, the hose-lines will be advanced in a "half-step" method, a smooth progression is to step forward or backward with the same foot. **Remember, this IS NOT a timed event, all fire behavior is dependent on the weather, especially the wind.**

At the start of the advance one hose-lines will be cooling the tank with straight stream to cool as much of the tank as possible at the center line of the tank. The second attack line will be concentrating on the flame impingement.

As the hose-lines progress adjustments to the fog pattern and height of the fog pattern must be made. Instructors should stop the hose-lines, make adjustments and then move on.

The fog patterns must cross each other in front of the instructor and at the center of the tank and at the same location on the ground. The hose-lines will continue to push the fire back away from the valve which is to be shut-off. The instructor will simulate closing the valve, at which time the propane source will be closed. **At no time will the instructor reach through the fog pattern to simulate closing the valve, the flames must be pushed beyond the valve.**

The hose-lines must hold for a few minutes after the valve has been "closed", this is to cool the tank, valves and piping so reigniting will not occur, also the integrity of the tank / cylinder must be assessed.

While "backing out" students will face towards the valve. They will not turn their back and face away from the valve and water is to be applied to the tank. The

hose line tender will pull the hose-line back, pulling back only enough to keep up with the groups.

The two hose-lines will start to "back out" in a half-step method, the hose-lines will not be shut down until they have reached a safe distance away from the tank at which time the instructor will give the command to "Shut down".

The students will need to be rotated positions. The nozzle person will go to staging, one of the staging person will go to hose line tender and everyone else will slide up one position until everyone had been in each position.

Foam Group:

Groups C and D will assemble and operate a foam concentrate system comprising 150' of 1 ¾" hose, an inline in-line educator and aeration nozzle and the appropriate gpm nozzle. The students will perform the four application techniques; Bank-down method, Roll-on method, Rain-down (Snowstorm) method and Over the Top method (instructor discussion).

Bank-down method is where the actual foam is being generated from the appropriate nozzle and is being bounced off from an object or a wall allowing the foam to gently flow onto the spill. The students should use at least two different shaped objects to bounce the foam off. This will allow the students to see how different shaped objects react to the building of the foam blanket.

Roll-on method is where the actual foam is being generated from the appropriate nozzle and is being piled in front of the nozzle and a pushing or sweeping action is pushing the foam blanket onto the burning fuel.

Rain-down method is where the actual foam is being generated by the appropriate nozzle and the discharged foam is directed almost vertical over the surface of the spill causing the foam to "Rain-down".

Over the top method is used on extinguishing bulk tank fires. Apply the foam at the location where air is being drawn into the fire. A cooling stream of water (not foam) is applied to the side of the tank to cool the tank shell and allow the foam applied to establish a beachhead. The foam is laid down like snow. This should be a discussion with each group.