

CLASS “B” FOAM OPERATIONS		TROY FIRE DEPT. TACTICAL PLAN 208.04	
<i>Issue</i>	<i>06/05</i>	<i>Revised</i>	<i>09/13</i>
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This plan will outline the basic operational procedures to be followed when the Fire Department operates at incidents requiring the use of foam. While this plan is oriented toward incidents involving flammable and combustible liquids, these guidelines may be applied to incidents involving hazardous vapor suppression and structure fires.

I. EQUIPMENT

A. The following foam equipment is available at each station:

- 1) One (1) 60 GPM eductor adjustable from 1% to 6% (1½” National Standard Threads)
- 2) One (1) Clamp-on low expansion foam tube (for use with Elkhart SM-30 1¾” nozzle)
- 3) Four (4) 5-gallon pails (minimum) of AFFF-ATC alcohol resistant foam 3%-6%.
- 4) One (1) Pro-Pack high expansion foam generator.

The Oakland County Hazardous Materials Response Team is equipped with a foam trailer that carries 330 gallons of ARFF concentrate as well as a variety of appliances that can rapidly apply large quantities of foam. They will need pumping apparatus from TFD to operate in conjunction with their equipment.

II. TACTICAL CONSIDERATIONS

A. In any situation where the use of foam is indicated, the following must be considered:

- 1) Type of incident: fixed site spill and/or fire; transportation spill and/or fire.
- 2) Type of containers; storage tank(s); drums; package quantity.
- 3) Characteristics of the flammable liquid spilled and/or burning.
- 4) How much is spilled/burning?
- 5) What are the exposures?

B. In incidents involving large amounts of flammable or combustible liquids on fire, the first arriving fire units may not have enough foam to effect total extinguishment. Fires involving flammable liquids can be expected to give off **excessive amounts** of radiant heat. In these situations, it may be necessary to protect the exposures and call for assistance before attempting to extinguish the fire. This radiant heat will have a detrimental effect on both exposures and firefighters.

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- C. Extinguishment should only be attempted when an adequate supply of foam is available.
- D. Position of apparatus and personnel. If tanks or containers are involved in fire, the potential for container failure exists. When operating at these incidents, apparatus and personnel should be placed uphill and upwind from the incident to minimize the danger of a sudden container release. Natural or man-made barriers such as berms, curbs, etc., may also be used to protect apparatus and personnel.
- E. Compatibility of product(s) involved with types of foam. No one brand or type of foam is suitable for use on all potential situations where foam may be required. Before applying foam, consideration must be given to:
 - 1) Type of fire/spill. Foam is effective in fires and spills involving two dimensions (length x width.) Foam is ineffective in three dimensional fires or spills such as a leaking tank truck where product is falling several feet to the street. In a three dimensional fire, foam can be used to blanket and extinguish the burning product that is on the ground, however, dry chemical will probably be required to effect extinguishment from the leak.
 - 2) The potential for water reactivity. Foam is over 90% water, and will react violently with products that are water reactive.
 - 3) Polar solvents are products that will readily mix with water, such as alcohol, ketones, and similar products. If these are encountered, the foam must be mixed at 6%.

NOTE: If the incident involves a gasoline (UN 1203) fire, it should be treated as a polar solvent since all liquids in this classification may contain up to 15% ethanol.

III. TYPE OF FOAM PRODUCED

High expansion, medium expansion, or low expansion, or a combination of all three may be indicated depending on the situation. In general, high expansion foam is effective for spill coverage. The effective range of the Pro-Pack is 5-10 feet depending on wind conditions. (*The Pro-Pack should only be used for incidents involving spills, or very small fires*). Medium expansion foam from the clamp-on tube has a range of 20-30 feet and is effective for extinguishment from a distance. Low expansion foam from standard nozzles is also effective for fire extinguishment, and provides the longest reach. A combination of

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high, medium, and low expansion foam may be used to secure initial knockdown of fire and blanketing to prevent re-ignition, and to provide personnel protection.

IV. TYPE OF FOAM TO USE

- A. AFFF-ATC (also labeled as AR-AFFF) is suitable for high expansion, medium expansion, or low expansion application to flammable liquids at 3%, and to alcohol or polar solvent based liquids at 6%
- B. **Class A foam used in the pumping systems of the pumpers must not be used to extinguish fires involving flammable liquids.**

V. PROCEDURES

A. Eductor Placement

- 1) The eductor(s) are not to be placed directly on the discharge of an apparatus, or on a gated wye because internal turbulence can affect the proper operation of the eductor. Eductors must be connected to the apparatus by a minimum of 8 to 10 feet of hose. This can be accomplished using the short section of 1 $\frac{3}{4}$ " hose on the preconnects or a separate length of 1 $\frac{3}{4}$ " hose. If possible, it is recommended that the eductor(s) be positioned in proximity to the apparatus supplying the water so the apparatus operator can monitor assist with the foam supply operation.
- 2) Using two handlines from one eductor (such as a wye on a 2 $\frac{1}{2}$ " eductor) should be avoided. For the eductor to work properly, both handlines must be in use to properly educt foam.

B. Pump Pressure

- 1) The 1 $\frac{3}{4}$ " eductors require 200 psi at the eductor.
- 2) Most eductors will educt foam at any pressure from 50-200 psi. At lower pressure, the flow of water will be less but the amount of foam will remain the same resulting in a higher concentration than shown on the metering dial.

C. Hose Length

A maximum of 600 ft. of 1 $\frac{3}{4}$ " hose is permitted between the eductor and nozzle. 10 psi must be added for each 100 ft. of 1 $\frac{3}{4}$ " hose between the apparatus and eductor.

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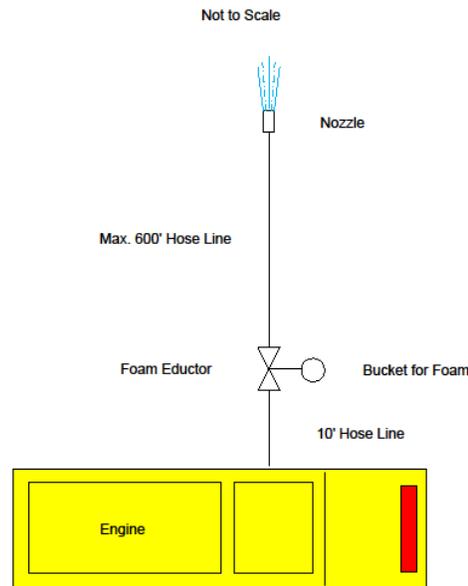
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Foam Line Example



D. Percentage Selection

1 $\frac{3}{4}$ " eductors must be set at 3% for normal flammable liquids. If a polar solvent is encountered, the eductor must be set at 6%.

VI. FIRE ATTACK

A. A minimum of two foam lines will be used, each with its own eductor and foam supply. The operators of these lines should remain in constant sight of each other. An adequate supply of foam must be in place before starting extinguishment.

- 1) In order to assure proper setup and operation, personnel preparing to apply foam shall flow each line to be used before approaching the spill/fire. Foam should be applied gently to the surface of the burning liquid by either lofting it in the air in a left to right sweeping pattern or by banking it from an object such as the side of a tank or vehicle.
- 2) A foam stream should never be directed at the spill as this will cause splashing resulting in increased vapor production fire intensity. Foam may

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be banked from the ground in front of a spill, which will cause the foam blanket to roll across the surface of the spill.

- 3) Care should be exercised to apply foam around obstructions such as tires, vehicle components, etc. This may be accomplished by using two foam nozzles.

- B. All operations flowing plain water must be discontinued if the water is entering the foam area. The water will dissolve the foam blanket, and allow re-ignition.

VII. PERSONNEL SAFETY

- A. All personnel present in the area must wear full personal protective equipment.
- B. Unless absolutely necessary, personnel shall not work in a spill area. If it is necessary to work in the spill area to perform a rescue or control a leak, foam shall be applied to seal any breaks in the foam blanket.
- C. Aluminized proximity suits are carried by the SRU for use in high radiant heat fire situations such as tanker fires.

VIII. PREVENT IGNITION/RE-IGNITION

- A. It is important to prevent ignition or re-ignition of a spill. Immediately after extinguishment of a flammable liquid fire, all items within the area of the fire will be extremely hot and must be assumed to be above the ignition temperature of the flammable liquid. Extreme caution must be used to keep the foam blanket intact around any metal objects. Frequent reapplication of foam may be necessary to minimize the possibility of re-ignition. Care must be exercised before initiating any activity that will disturb the foam blanket.
- B. A combustible gas detector (Explosimeter) can be used to monitor the foam blanket for flammable vapors in order to determine when reapplication of foam is necessary. All potential sources of ignition must be controlled such as running vehicles, flares, electrical equipment, pilot lights, and any hot objects.

IX. CONTROL RUNOFF

Attempt to control runoff into storm drains, sewers, or drainage systems. If vapors are present, maintain a foam blanket or an application of Bio Solve pending disposal. Consider requesting DPW for dump truck(s) loaded with sand as soon as possible.

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X. ON-BOARD CLASS B FOAM PUMP OPERATIONS

The TFD Pierce PUC (Pump Under Cab) apparatus are capable of drafting and pumping Class B foam. In this situation, the eductor assembly is connected to the Foam Inlet on the pump panel as shown in the photo. Refer to the diagram for specific drafting procedures.



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Draft Class B

Follow these steps to draft Class B foam.

1. Set up the drafting operation by positioning the foam and hooking up the pickup hose.
2. Press the MODE button until the name of the desired foam source appears on the display screen.
3. Press ENTER to accept the new foam source. Begin to flow water immediately to allow automatic flush to occur.
4. Insert hose into foam supply to begin drafting.
5. Press the UP or DOWN arrow buttons to select the desired foam injection percentage as needed.



NOTE: When the flowmeter senses water flow, an automatic pre-programmed flush of 10 to 15 seconds will occur when changing from Class A to Class B foam. **NEED WATER FLOW TO FLUSH:** Means open a foam discharge so the system can do its flush!

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