

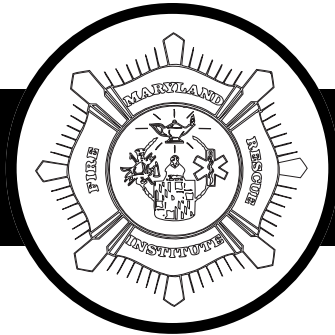
Protective Envelope and Foam

Maryland Fire and Rescue Institute, University of Maryland at College Park

Session 3-1

Handling Hoselines and Foam Application

- The student will be able to demonstrate utilizing hoselines and foam applicators.



Protective Envelope and Foam

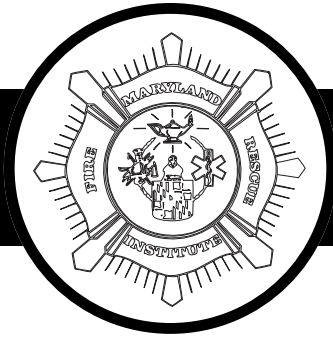
Maryland Fire and Rescue Institute, University of Maryland at College Park

Session 3-1

Handling Hoselines and Foam Application

Overview:

- Types of Fuel
- Principles
- Determining Application Rate
- Assembling a Foam Fire Stream
- Tactical Consideration for Foam Operations
- Nozzle Usage
- Advancing Line
- Assemble Foam Equipment
- Method of Applying Foam



Protective Envelope and Foam

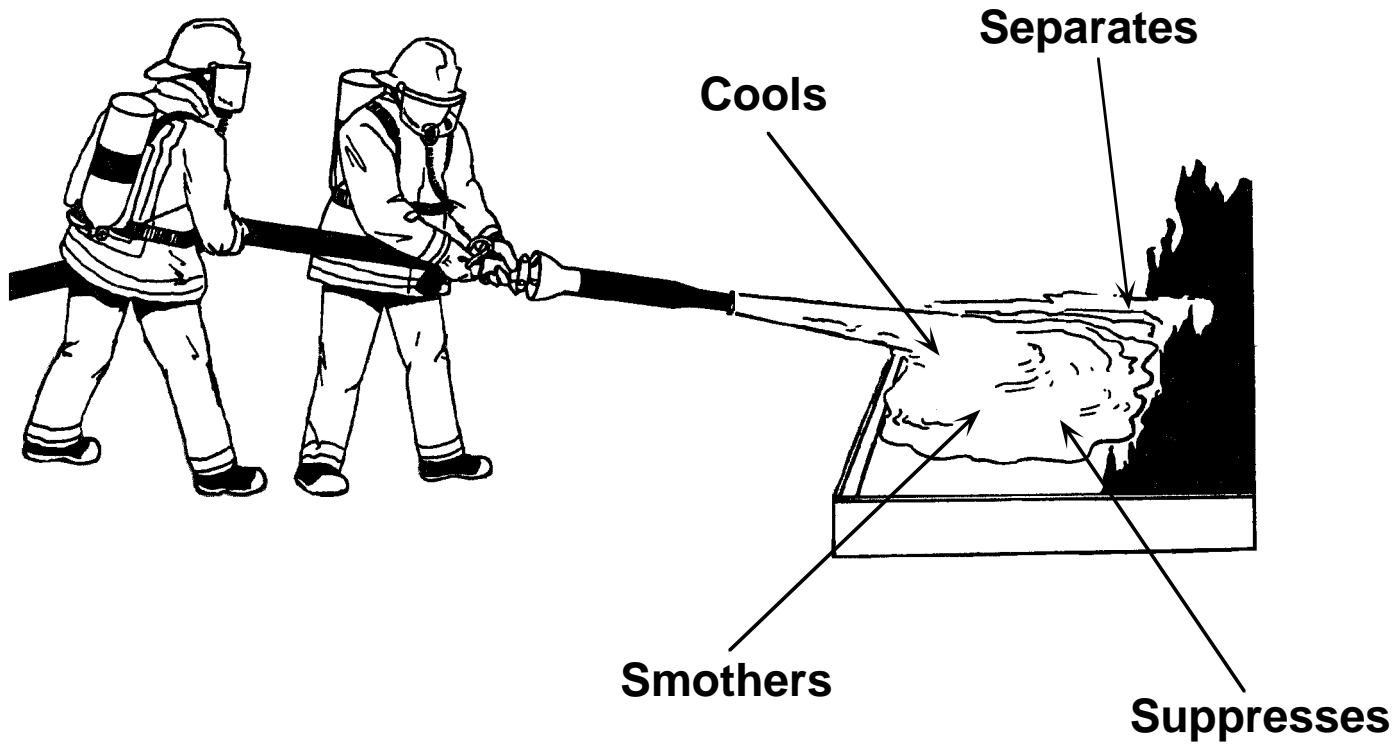
Maryland Fire and Rescue Institute, University of Maryland at College Park

Session 3-1 Handling Hoselines and Foam Application

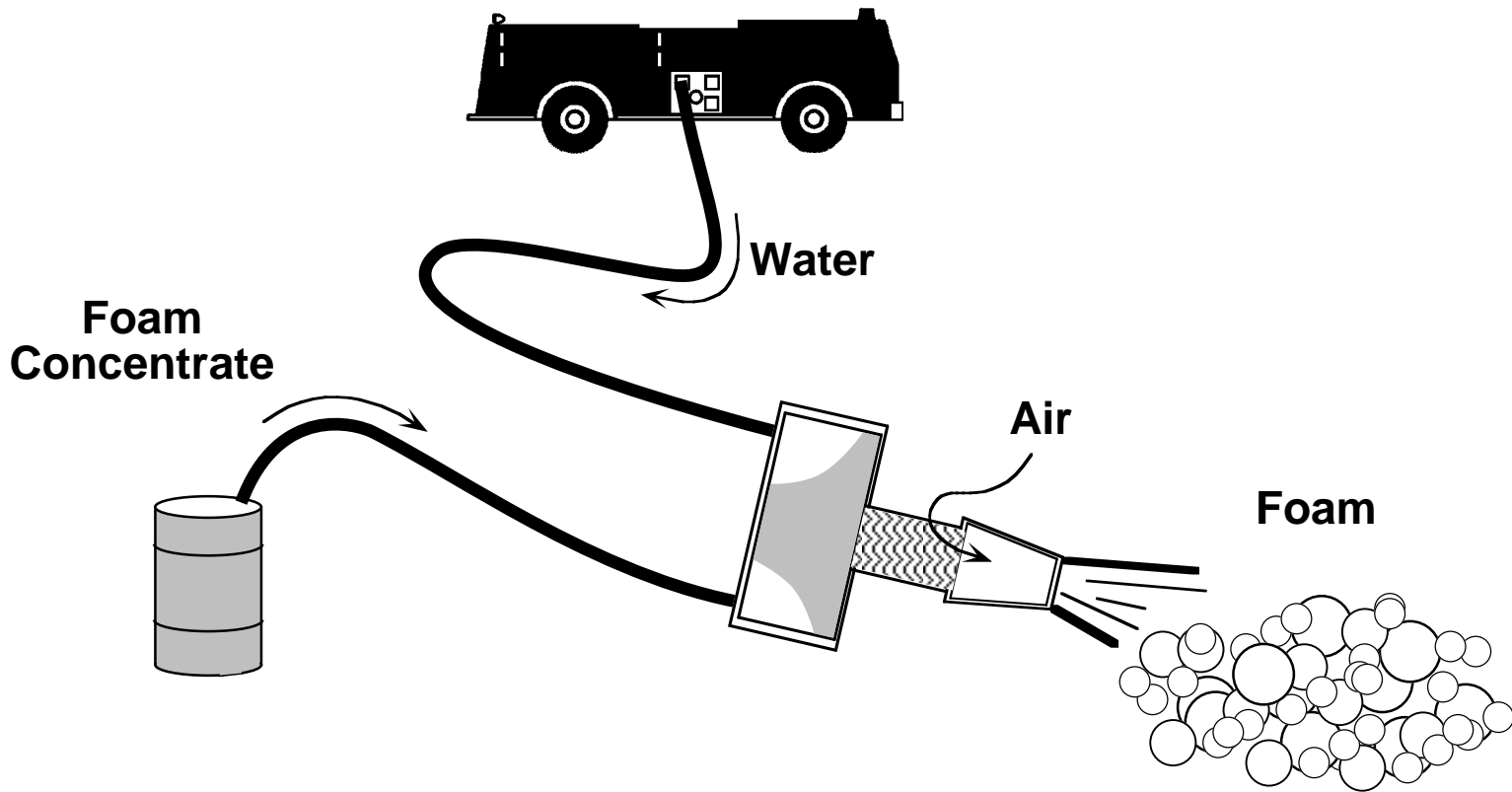
Review:

- Types of Fuel
- Principles
- Determining Application Rate
- Assembling a Foam Fire Stream
- Tactical Consideration for Foam Operations
- Nozzle Usage
- Advancing Line
- Assemble Foam Equipment
- Method of Applying Foam

How Foam Works



How Foam is Made



Percentage Concentrations:

HYDROCARBON FIRE FOAMS
1 - 6%

POLAR SOLVENT FIRE FOAMS
6 - 10%

MEDIUM & HIGH EXPANSION FOAMS
1, 2, OR 3%

FFFP OR AFFF
5:1 TO 10:1

Application Rates:

**AFFF and FFFP
.10 gpm solution / sq. ft.**

**Polar Solvent foams
.24 gpm solution / sq. ft.**

**Protein, fluoroprotein foams
.16 gpm solution / sq. ft.**

Example 4 (U.S.)

12 x 100 foot spill of #2 fuel oil = 1,200 square feet

**Recommended application rate for AFFF = 0.10 gpm
solution per square foot of fire**

0.10 multiplied by 1,200 = 120 gpm solution

**Simply stated: 10% of the fire area equals gpm foam
water solution**

**HOW MUCH FOAM CONCENTRATE IS
NEEDED AT A 3% INDUCTION RATE?**

AT 6%?

**0.03 x 120 gpm = 3.6 gallons foam concentrate
per minute**

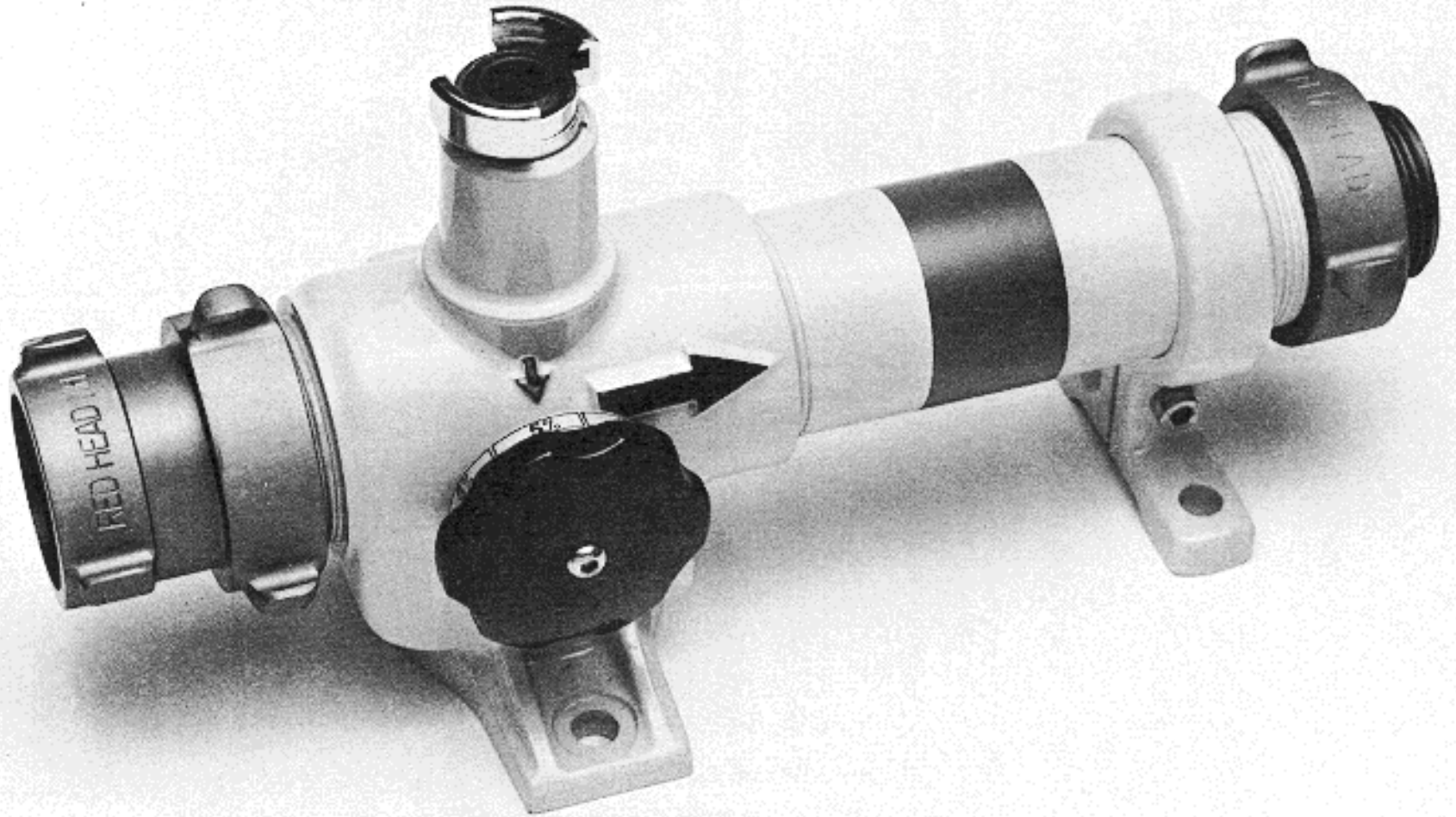
15 minutes = 54 gallons

**0.06 x 120 gpm = 7.2 gallons foam concentrate
per minute**

15 minutes = 108 gallons

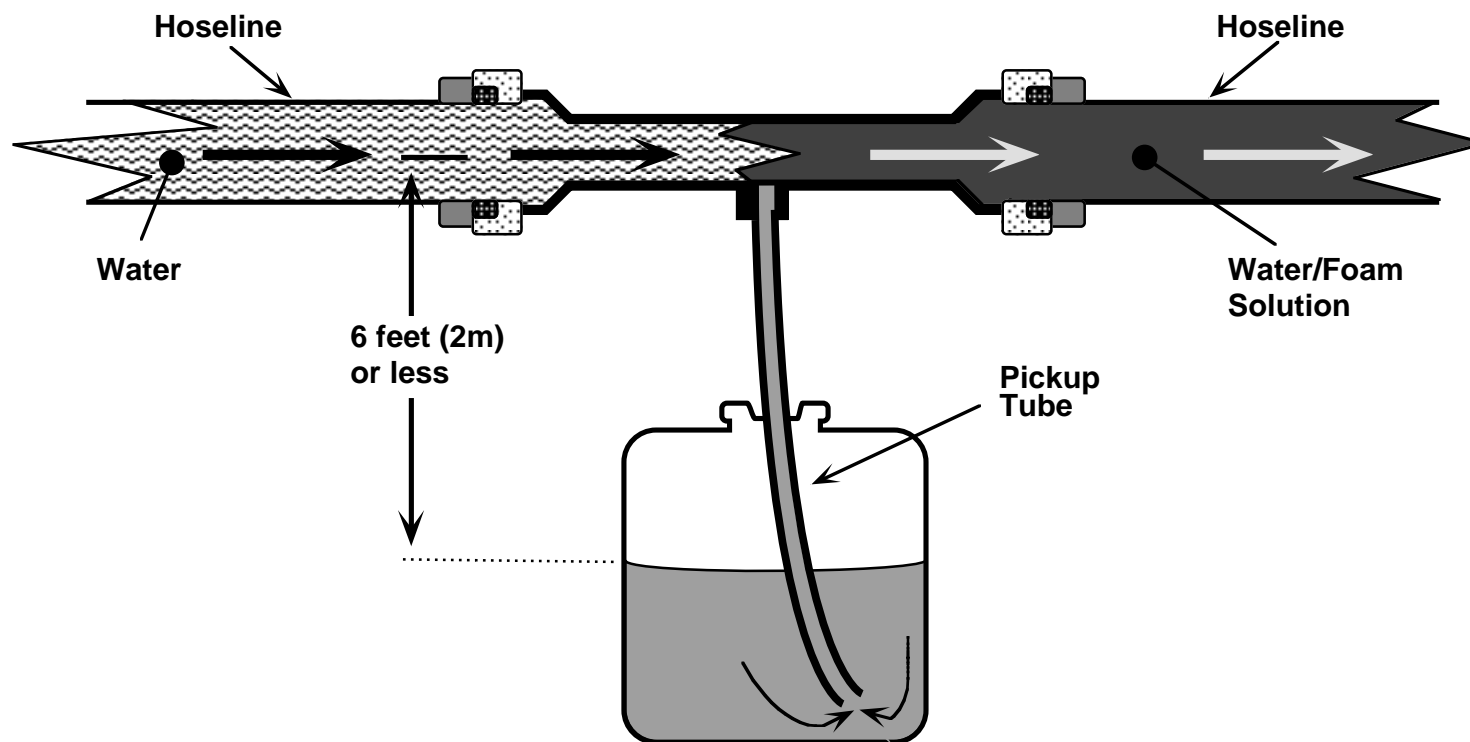
**Using the AFFF application rate (0.10 gpm/ft²) for
hydrocarbon fuels, how much fire will a:**

- **60 gpm nozzle and eductor handle?**
 - **60 gpm solution divided by 0.10 = 600 ft²
(20 x 30 feet)**
- **120 gpm nozzle and eductor?**
 - **120 gpm solution divided by 0.10 gpm = 1,200 ft²
or 30 x 40 feet**



T-FFII-8-1-19

In-Line Educator



T-FFII-8-1-20

Desirable Qualities of Foam:

- **Flows freely, covers fuel surface rapidly**
- **Forms tough, vapor tight blanket**
- **Resists heat and fuel pick up**
- **Resists wicking**

Tactical Considerations:

- **Personnel accountability**
- **Full protective equipment**
- **Utilize pairs of matched nozzles**
- **Attack from uphill and upwind whenever possible**
- **Minimize number of personnel in spill area**
- **Maintain foam vapor seal**
- **Establish adequate back-up lines**

Operational Tactics:

- **Apply foam in massive quantities for involved hazards**
- **Apply gently**
- **Never plunge stream into spill**
- **Personnel**
 - **Nozzle person**
 - **Officer / crew chief**
 - **Pump operator**



CAUTION

FIREFIGHTERS BEWARE!!

MOST COMMON MISTAKES:

- Water misuse / breaking up foam blanket
- Failure to apply enough foam
- Foam may be ineffective on moving, spraying, pressurized, flammable liquids fire
- Dry chemicals - stop combustion chain reaction
- Foam conducts electricity

DO NOT WALK THROUGH PRODUCT

T-FFII-8-1-24