

# CAFS On-Line Orientation

*Montgomery County  
Fire & Rescue Service*



*Making CAFS*



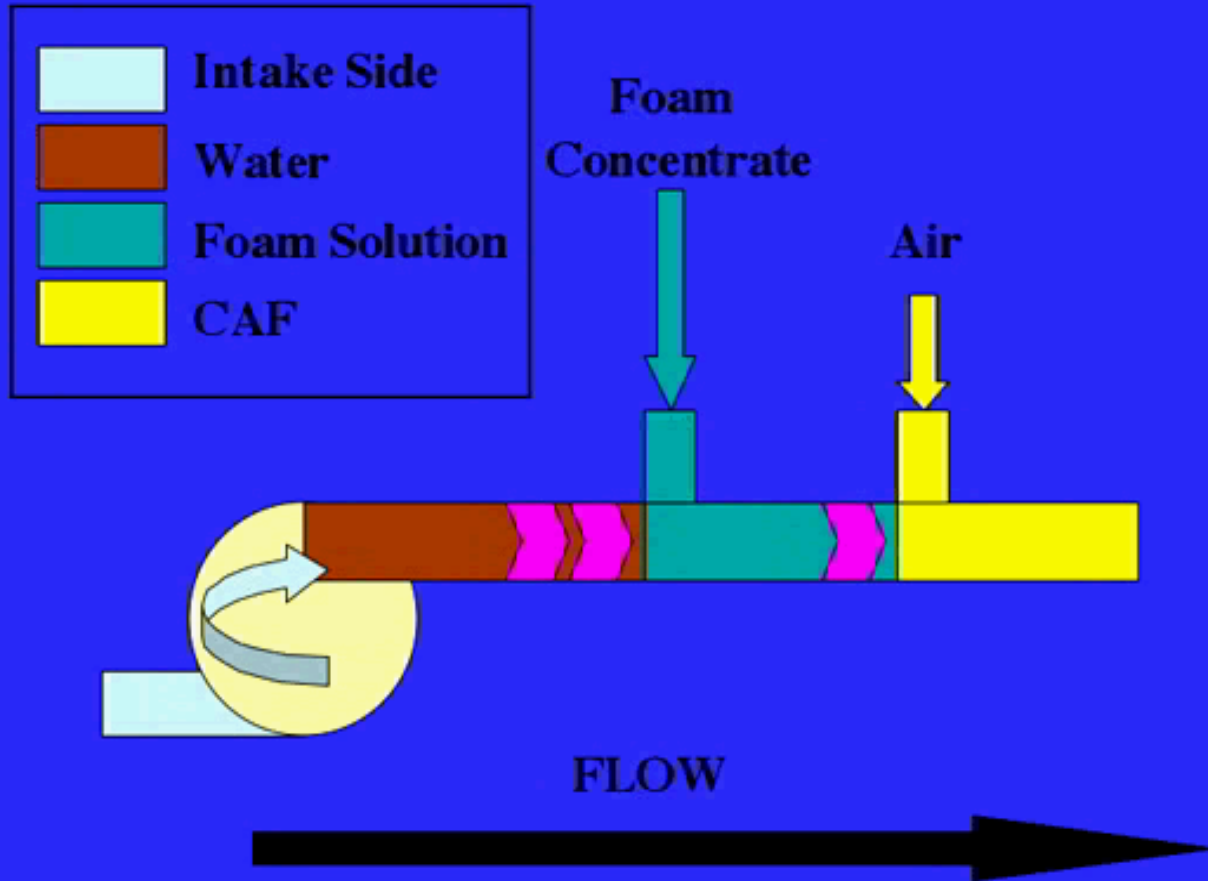
# Making CAFS

## Module Objectives

- Learn and Identify Main Components
- Learn how these components work
- Understand how the components work together to produce CAFS



# How does it work?



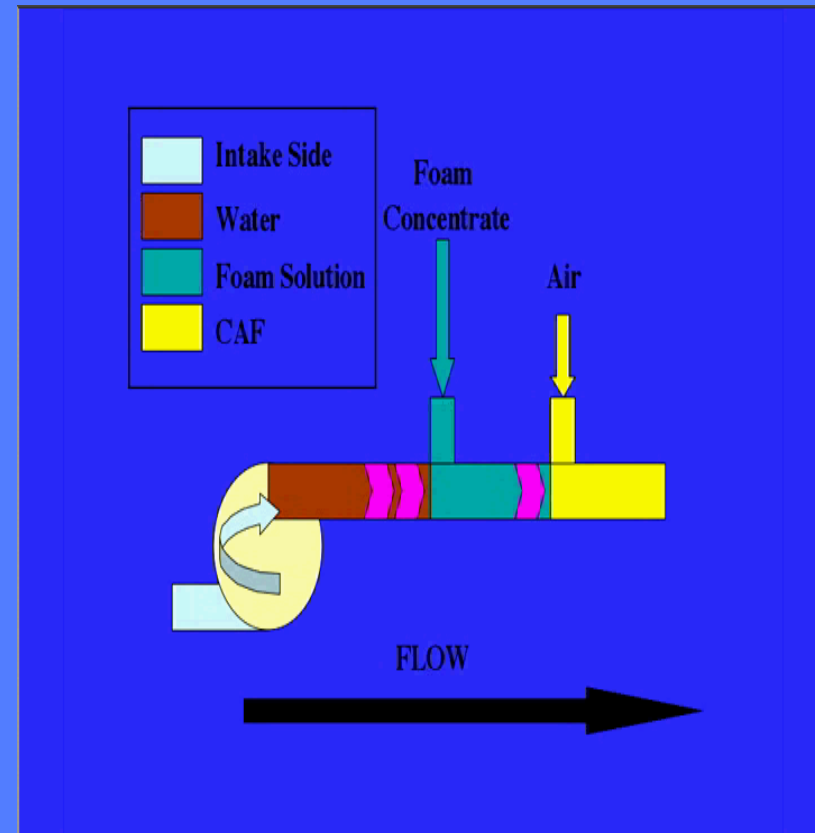
# How does it work?

Water leaves discharge side of the pump.

It then goes into the foam manifold where foam is added (from the foam pump).

It then goes into the CAFS manifold where air is added (from air compressor).

Purple arrows represent check valves which prevent backflow of foam solution or CAFS.

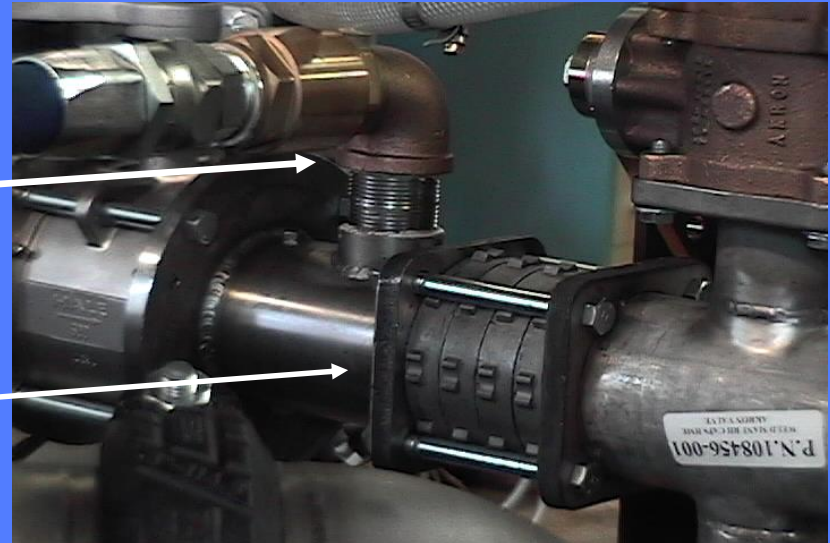


# How does it work?

After air is injected in the CAFS Manifold, the foam product passes through mixing grates. This provides agitation. Further agitation and mixing occurs in the hose lines. Finished foam then comes out of the nozzle.

Air injection valve

Mixing grates



# Important CAFS Components



## Foam Pump

- FoamLogix Pump
- Paddlewheel Flow Sensor



## Air Compressor

- Air Compressor
- Air/Oil Separator
- Water/Oil Heat Exchanger



## Pump (Foam Manifold)

- Stainless Steel Manifold
- X-type Mixers



# FoamLogix Proportioning System

- 5.0 GPM foam pump
- Rotary Gear Design driven by electric motor.
- Electronic Controller Interface - determines how much concentrate gets pumped into Foam manifold.
- If water pump discharge pressure is over 250 psi, the foam pump will not be able to inject foam concentrate into the water stream.



# Hale Approved Compatible List

Type of Foam Concentrate	Manufacturer	Name	
<b>CLASS A FOAM</b>			
<b>US Forestry Service Approved</b>			
<div style="border: 2px solid yellow; padding: 5px;">                     For use in Foamlogix model 5.0, 3.3, and 2.1A and Hale V-Series                 </div>	Ansul	Silvex Class A Foam Concentrate	
	Angus	Forexpan S (0.1%-1.0%)	
	Chubb National Foam	1st Defense Class A Cold Water Foam	
	Chubb National Foam	Knock-Down	
	Monsanto	PhosCheck WD881	
	Chemonics	Fire-Trol Fire Foam 103	
	Chemonics	Fire-Trol Fire Foam 104	
	3M	Light Water FT-1150	
	<b>Non U.S. Forestry Service Approved</b>		
	ChemGuard	Class A Plus	
UniFoam Co. Ltd.	UniA 1%		
3M	Light Water SFFF		
Chubb National Foam	Responder		
Angus Fire	FirePower 0.1-1% Class A Foam (P/N 3170)		
<b>CLASS B FOAM</b>			
<b>AFFF- Alcohol Resistant Concentrates</b>			
	3M	3% Alcohol Type AFFF Conc. (P/N 98-0211-6573-7)	
	Ansul	3x3 Low Viscosity Alcohol Resistant Concentrate	
	ChemGuard	AR 3%-6% Part # CAR36P	
	ChemGuard	AR-AFFF, 3%x3%, Part # C333	
	ChemGuard	Ultraguard 1%-3% Part # C-133	
	Angus	ALCHOSEAL 3.3%	
	Chubb National Foam	Universal Gold 3% AR-AFFF	
	Chubb National Foam	Universal Gold 1% - 3% AR-AFFF	
	US Foam	1-3% Alcohol Resistant AFFF (P/N US-AR13)	
	US Foam	3-6% Alcohol Resistant AFFF (P/N US-FCAR36)	
AFFF	Chubb National Foam	1% Aero-Water	
<b>SPECIALTY FOAM CONCENTRATES</b>			
Protein	Chubb National Foam	Terra Foam 3% CF	
	Chemonics	Durra Foam 3%	
<b>FIRE FIGHTING WATER ADDITIVE</b>			
	Hazard Control Tech.	F-500 (1%, 3%, 6%)	

MCFRS will be using National Foam's Knockdown for Class A Foam. This is the only foam that should be put in the Class A foam tanks.

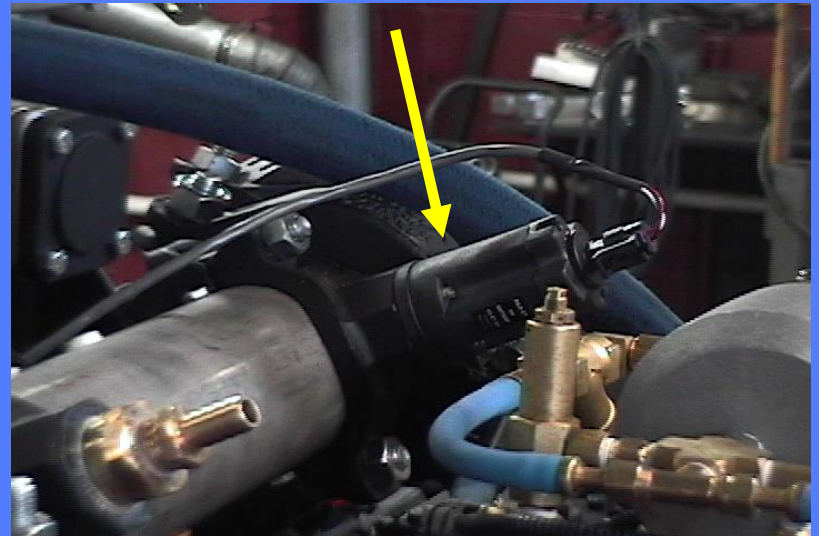




# Paddlewheel Flow Sensor

- Internal Paddlewheel Design
- Accurate from 30 to 800 gpm
- Sits in foam manifold

Talks to Foam Pump ECI to tell it how much foam concentrate to inject.



# Air Compressor



- Rotary Screw Oil-Bathed Design - oil is necessary for cooling reasons



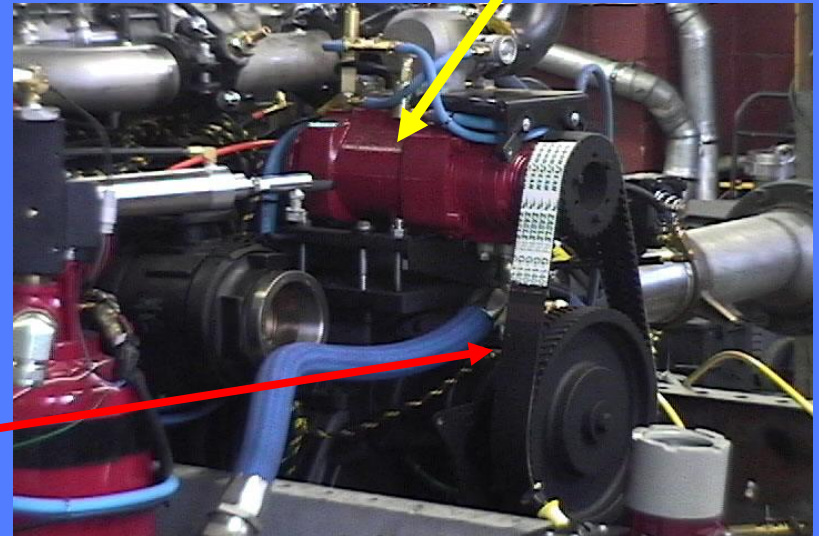
- **210 SCFM** rating - which is one of the largest on market



- Belt-Driven off of the fire pump gear box
  - No load start

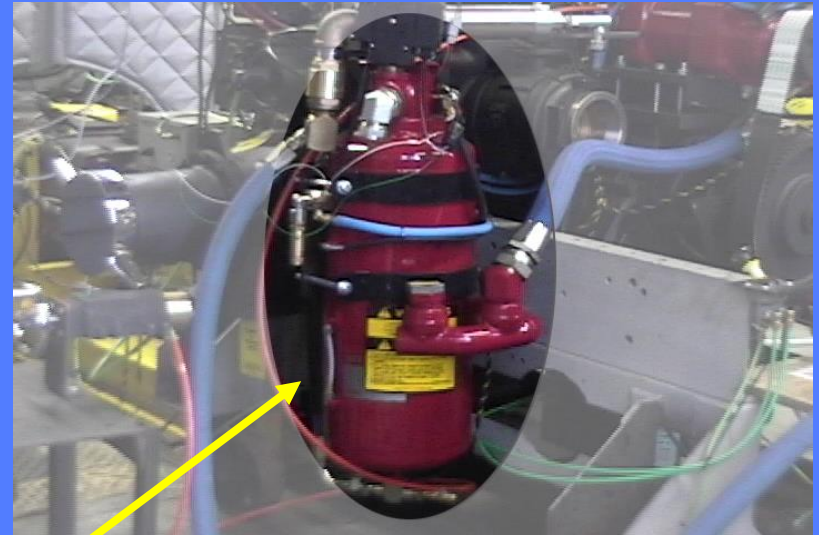


- Delivers 75 to 150 psi



# Compressor Air/Oil Separator

- Element based
- Also acts as oil reservoir
- Provides some over pressure protection
- Oil Level Sight Tube



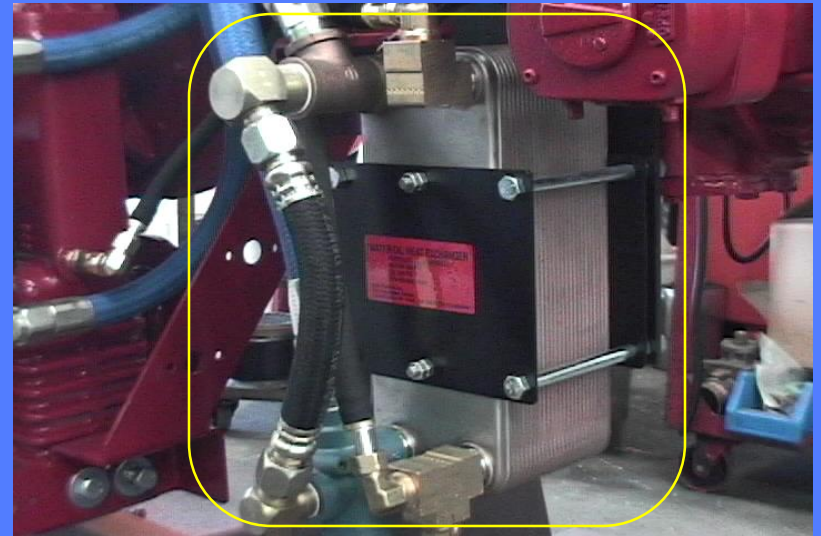
# Air/Oil Separator



- Large Min/Max Sticker
- DO NOT OVERFILL!
- *DO NOT OVERFILL!*
- Check when oil is cold and therefore has no froth

# Water/Oil Heat Exchanger

- Pump Water Fed - line runs from discharge side of pump back to intake. This is critical for keeping compressor cooled. It is critical to keep water circulating in your pump.





# Water/Oil Heat Exchanger Strainer

This strainer protects the air compressor water/oil heat exchanger.

The strainer should be cleaned out after every use of the CAFS system.

Do NOT open this cap when the pump is engaged - the cap will be under pressure and could seriously injure you.



# Maintenance Points



- Bleed water out of the Air/Oil Separator every month

- Remove and clean Water/Oil heat exchanger strainer every use



- The Air/Oil Separator Oil and Filter should be changed every time the engine oil is changed

- Compressor air filter should be changed every time the engine air filter is changed



# Foam Manifold

- Made out of Stainless Steel to resist corrosive effects of foam
- Capable of up to 1000 GPM Flow - all pre-connected handlines are plumbed off of this manifold. Therefore you are limited to an combined total flow of 1000 gpm at any one time through your handlines.
- Pump panel discharges are **not** plumbed off this manifold.

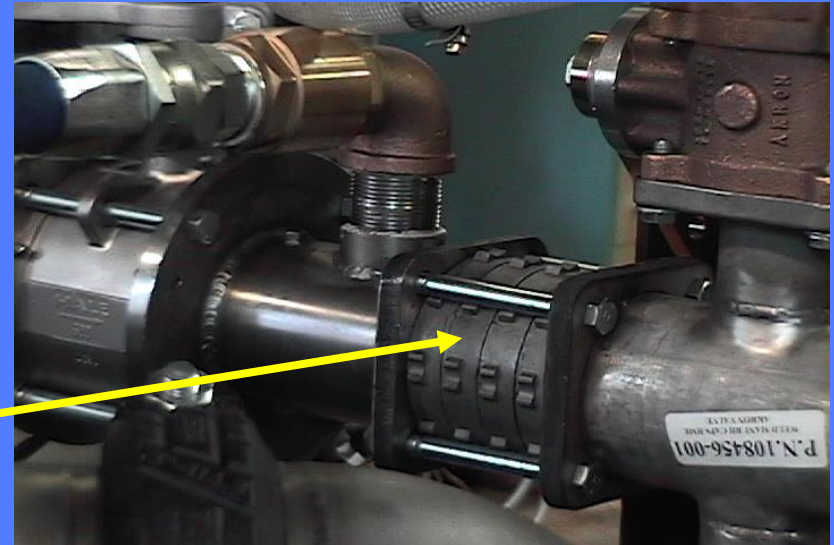




# X-Type Mixers

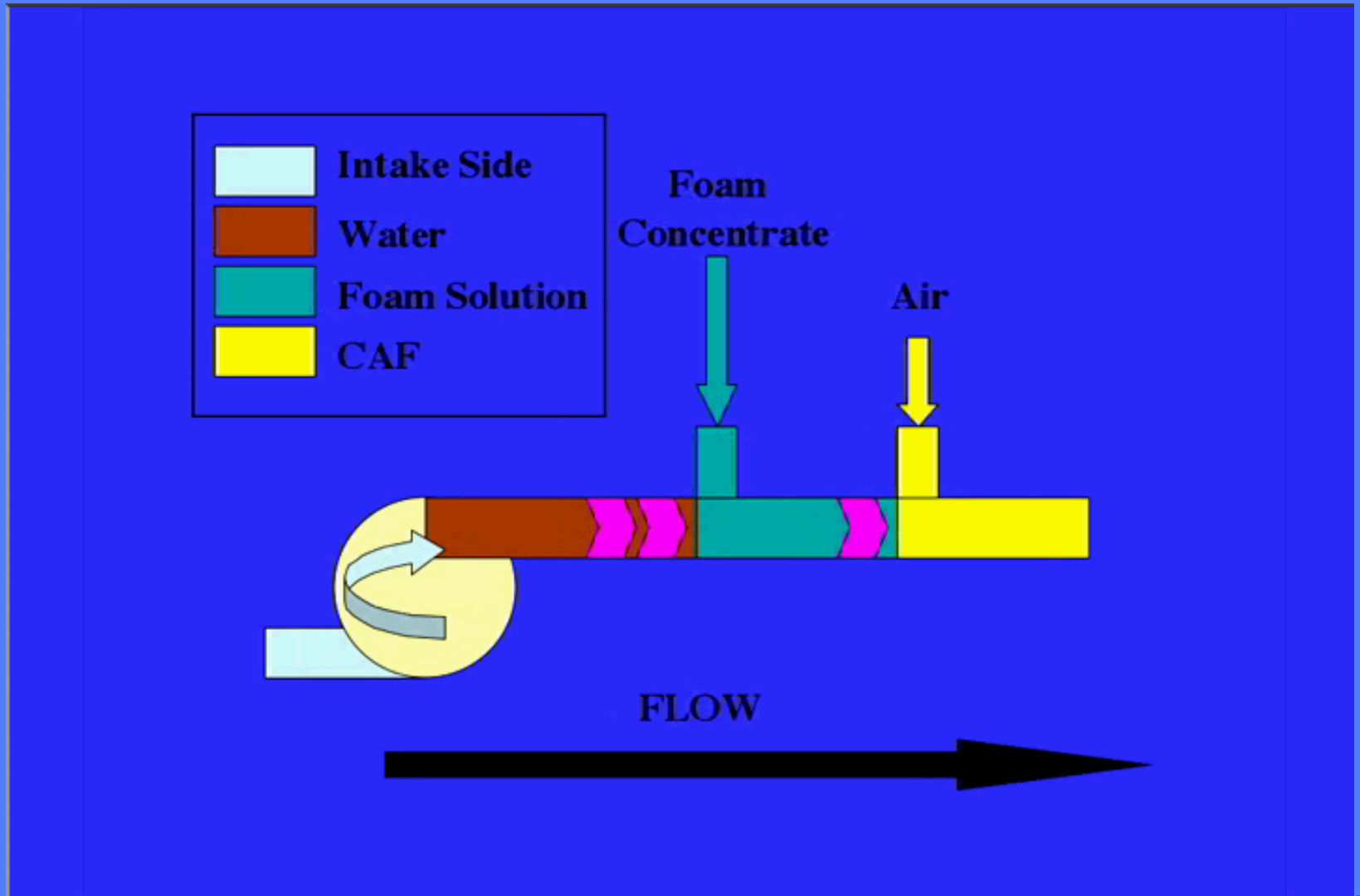


- Stainless Steel Design
- 4 Variable Position “Fingered” grates




*Flow*

# Bringing it All Together




# Review Questions



When should the oil in the air compressor oil reservoir be checked?

How does the foam pump know how much foam concentrate to inject into the water stream?



Put the following terms in the order in which water flows through them to become CAFS. Also list in which parts the foam and air get added.

CAFS Manifold      Discharge Manifold



Foam Manifold      Fire Pump

Check Valves (can use more than once)

How many CFM can the air compressor produce?

