#### 14 CFR 139

Although "FAR" is used as the acronym for "Federal Aviation Regulations," it's use is being discouraged by the FAA.

- The FAA is now citing the regulations with reference to
- Title 14 of the Code of Regulations.
- FAR 139.321 is now ...
- 14 CFR Part 139 Section 321



14 CFR 139 Revisions Effective June 9, 2004

The term "Grounding" has been eliminated.
New requirements for Recurrency training in fueling safety for supervisors and employees every 24 months.
Air Carrier fueling operations will now be subject to 139 inspection standards.
Airports with Air Carrier operations utilizing aircraft with

more than 9 passenger seats but less than 31 seats will now be included.



How does 14 CFR 139 apply to fueling operations?

Airports which hold a Part 139 certificate are required to establish and maintain standards which protect against fire and explosion during fuel handling operations. Airports and fuel handling operations must comply to the requirements of <u>14 CFR 139.321</u>



The standards shall cover facilities, procedures, and training and should include-

- Grounding and Bonding
- Public Protection
- Control of Access to Storage Areas
- Fire Safety in Storage Areas and Fueling Vehicles
- Training of Personnel in Fire Safety
- Fire Codes of Agency Having Jurisdiction Over the Airport



Who provides the required training?

- At least one supervisor with each fueling company on the airport shall have completed an <u>approved aviation fuel fire</u> <u>safety course.</u>
- Supervisor will provide on-the-job training to other employees of the company

The airport holding the certificate must perform surveillance of fuel activities to ensure that the above standards are met and conduct an inspection of the fueling facilities <u>at least once every 3</u> <u>months.</u>



#### Now....Let's Review Fire Safety

## **FIRE** SAFETY TRAINING The Fire Triangle



#### Extinguish Fire

- Three things must be present at the same time to produce fire:
- Enough OXYGEN to sustain combustion
- Enough HEAT to reach ignition temp
- Some Fuel or combustible material
- Together, they produce the CHEMICAL REACTION that is fire.



#### POTENTIAL SOURCES OF HEAT

Brakes
Mufflers
Wheels
Broken Lights
Engines
Exhaust Manifold



#### STATIC ELECTRICITY can take <u>up to 3 minutes</u> to dissipate through the bonding cable.



#### SAFETY TRAINING Flash point

WHAT???

Lowest temperature at which the liquid fuel gives off vapor in sufficient concentrations to allow it to ignite.



#### Why FLASHPOINT is important

If an ignition source is introduced to the surface of the fuel, and it is <u>at or above</u> the flash point temperature, the vapor can ignite.



#### Know your FLASHPOINT Temperatures!



#### -50 Fahrenheit

Jet-A

**100 Fahrenheit** 





#### SAFETY TRAINING FLAMMABILITY



# Mixture of fuel and oxygen % of fuel in the air that will allow ignition to occur



#### SAFETY TRAINING FLAMMABILITY

#### Why FLAMMABILITY is important

Fuel/Air mixture of aviation fuel is within flammability range = ignitable and will burn continuously

## FIRE SAFETY TRAINING FLAMMABILITY RANGE

Range of Avgas Lower Limit = 1.4% Upper Limit = 7.6%

> Range of Jet-A Lower Limit = .74% Upper Limit = 5.32%

## FIRE SAFETY TRAINING FLAMMABILITY RANGE

What if it falls outside of these limits?

<Lower limit = too lean to ignite</li>
 > Upper limit = too rich to ignite



## FIRE SAFETY TRAINING **AUTOIGNITION**



Temperature fuel will automatically ignite Without a spark or other ignition



## FIRE SAFETY TRAINING **AUTOIGNITION**

#### Autoignition Temperatures?



#### 840 Fahrenheit

Jet-A

475 Fahrenheit



IS THERE A DIFFRENCE BETWEEN AVGAS & JET-A?

Once fuels have been ignited, there is a marked difference in the rate of flame spread for different fuels.



Rate of Flame Spread

Why this is important?

Evaluating severity of a fire



#### Ignite a POOL of FUEL

#### Flame spread of Avgas is 30x greater than Jet-A



Fuel releases in MIST FORM (Aircraft accident) Rate of flame spread is =

225





#### U.S. DOT Identification Numbers

Avgas

1203

Jet-A

1863



#### **SAFETY TRAINING Classes of Fire**

Class A: Wood, Paper, Cloth, Trash, Plastics Class B: Flammable Liquids-gasoline, Oil, Grease, acetone. Including flammable gases. Class C: Electric-energized electrical equipment. As long as it's "plugged in" Class D: Metals-potassium, sodium, aluminum, magnesium



#### **FIRE SAFETY TRAINING Classes of Fire**

Class A fires generally leave a ash. Class B fires generally involve materials that Boil or Bubble. Class C fires generally deal with electrical Current



### FIRE SAFETY TRAINING **Classes of Fire**

Evaluate the fire: Ask yourself...

What SIZE is the fire? Is it TOO LARGE to fight? Can the fire be COMPLETELY **EXTINGUISHED?** 



## **SAFETY TRAINING EVALUATE THE FIRE**

Do you have an appropriate extinguisher? Can you assess the CLASS OF FIRE? Will the fire BLOCK YOUR ESCAPE? Could it CAUSE AN EXPLOSION?



## **FIRE SAFETY TRAINING EVALUATE THE FIRE**

#### Is professional assistance available to **HELP**? CALL THEM!!!!!!



Most portable extinguishers have only 10 to 20 seconds of discharge capability.



Acronym for fighting a fire?

P--- PULL the safety pin A--- AIM the nozzle S--- SQUEEZE the trigger S--- SWEEP the base of the flame



#### FLAME IS NEARLY OUT ■ WHAT NOW?

Steadily move forward Maintain rapid back and forth movement



#### FIRE IS OUT

#### DO NOT TURN YOUR BACK ON THE FIRE!!!!

Danger: Flashback and Re-ignition



#### REFUELER Requires?

At least 2 "20-BC" rated fire extinguishers mounted on either side of the vehicle and **OPERATIONAL** at all times

#### **SAFETY TRAINING FIRE EXTINGUISHER**

Hydrant service vehicle requires?

1 extinguisher rating not less than "20-BC"



#### ACCEPTABLE CLOTHING: Best type?

100% cotton and leather boots with rubber soles



#### FUNNEL USE Use high quality, non-galvanized metal

Do not use plastic funnels or buckets---They generate to much static electricity



## **SAFETY TRAINING**

#### BONDING

- Must be completed during fuel transfer of any kind
- From fuel storage to fueling vehicle
- Refueler to hydrant cart
- Truck to truck
- Truck to aircraft



#### DEADMAN OPERATION

Jamming or fixing the deadman control into the on position with a device other than the operators hand is strictly prohibited



#### Refueling Nozzle No plug or receptacle on the aircraft wing, THEN.... Touch the filler cap with the fuel nozzle before removing the cap



#### EMERGENCY SHUTOFF Must be capable of overriding all other fuel controls

STOP fuel flow with one physical movement



Refueling with Passengers on Board One qualified flight crew member, trained in emergency evacuation procedures, must be in the aircraft near an exit.



#### IMMEDIATE Fuel Spill Procedures

STOP the flow of fuel Fire extinguisher UPWIND NOTIFY your supervisor and fire authority



## **SAFETY TRAINING**

#### ADDITIONAL Fuel Spill Procedures DO NOT start or turn off or move any equipment DIRECT traffic away from area Assemble equipment & spill material COMMENCE cleanup when authorized by fire authority