



Maritime Helicopters

FUEL QUALITY AND SAFE HANDLING

Part 1



FUEL QUALITY AND SAFE HANDLING

- **Code of Federal regulation (CFR) Part 139.321 pertains to the safe and efficient fueling operations at airports.**
- **Airports certificated under Part 139 must ensure training is provided in the areas listed in 14 CFR § 139.321 (b) for personnel who's duties and responsibilities involve the handling and storing of hazardous substances and materials.**
- **Part 139.321 (e) (1) requires that “at least one supervisor with each fueling agent must have completed an aviation fuel training course in fire safety that is authorized by the Administrator.”**



FUEL QUALITY AND SAFE HANDLING

Rubber gloves



- The Code of Federal regulation (CFR) 1910 addresses the requirement for an employee to ensure affected employees have a and utilize proper PPE for the work area and associated hazards.
- Personnel shall not carry cigarette lighters or matches on their person in and around fueling equipment.



FUEL QUALITY AND SAFE HANDLING

- A Hazardous Material is defined as:

“Any substance which may pose an unreasonable risk to health and safety of operating or emergency personnel, the public, and/or the environment if not properly controlled during handling, storage, manufacture, processing, packaging, use, disposal, or transportation.

- Aviation fuels are classified into two basic groups;

1. Aviation gasoline is commonly called Avgas for reciprocating piston engines
2. Aviation turbine fuels, commonly called Jet fuel, for use in turbo-propeller and turbo-jet engines



FUEL QUALITY AND SAFE HANDLING

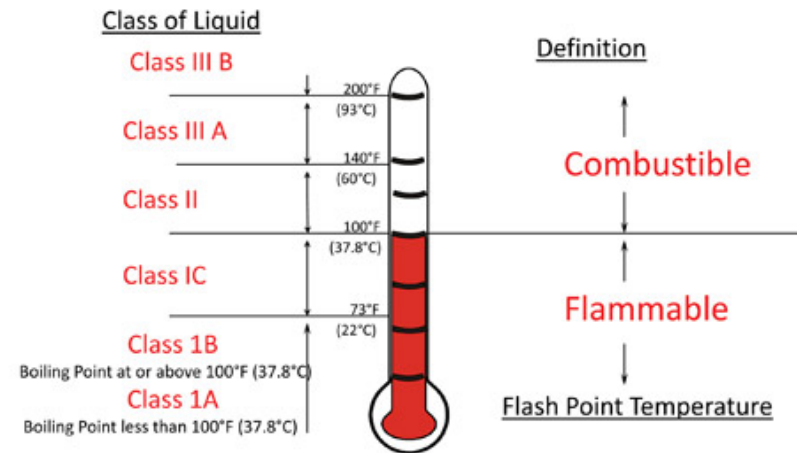
Flash point vs Auto ignition

- **Flash point** is the lowest temperature at which a liquid can form an ignitable mixture in air near the surface of the liquid. The lower the flash point, the easier it is to ignite the material.
- The **auto ignition** temperature of a substance is the lowest temperature at which it will spontaneously **ignite** in a normal atmosphere without an external source of **ignition**, such as a flame or spark.

Fuels are classified according to their Flashpoint or Flammability Temperature

NFPA® 30, NFPA® 1, and IFC

Flammable/Combustible Liquid Classification by Flash Point





FUEL QUALITY AND SAFE HANDLING

- **STATIC ELECTRICITY**
- API/EI 1529 Type “C” Semi Conductive fueling hose shall be used to prevent electrostatic discharge (however, it DOES NOT accomplish the required Bonding connections)
- Plastic buckets and plastic funnels increase the generation of Static Electricity
- The primary generator of electrostatic charge in a fueling system is the fuel filter



FUEL QUALITY AND SAFE HANDLING

- **STATIC ELECTRICITY**
 - **Bonding shall be verified by determining the maximum resistance between the Bonding cable/clip/or plug and the fueling system framework**
 - **Monthly inspection requires the reel to be unrolled all the way and Ohms check resistance shall be no more than 25 ohms between the clip and the framework.**
 - **NEVER operate the fueling system or fuel aircraft if lightening flashes are in the immediate vicinity of the airport.**
-
-
-



FUEL QUALITY AND SAFE HANDLING

- SPILL RESPONSE AND ENVIRONMENTAL HAZARDS
- Aviation fuels in particular can be harmful to aquatic organisms and may persist in their environment.
- Aviation fuels may also find their way into water drainage systems and possibly drinking water supplies.
- **Contamination of waterways and drainage systems must be prevented at all costs.**
- The first immediate response to a spill is that the flow of fuel should be stopped by activating the **Emergency Fuel Shut Off**



FUEL QUALITY AND SAFE HANDLING

- EMERGENCY RESPONSE PLAN
- Everyone should be familiar with Maritimes' Emergency Response Plan for your specific location to ensure proper reaction in the event of an emergency
- Regular inspections of work areas involving dangerous substance should be done. All personnel should be trained in the location and operation of all Emergency Fuel Shutoff Controls
- One of the **first** things anyone should do when working in hazardous environments is to know the location and use of safety equipment, to include **available fire extinguishers**



FUEL QUALITY AND SAFE HANDLING

- Clear and Bright Test (API Bulletin 1500; ATA Specification 103 2-3)
- The term "Clear and Bright" means that, when visually examined in a clear glass container, the fuel is visually free from undissolved water, sediment, and suspended matter. Fuel suitably free from these contaminants produces a bright sparkling appearance
- ***NOTE: "Jet B" fuel normally ranges in appearance from water white to a light straw or light amber color. ("Water White" means the fuel has no color and is as clear as water.)***



FUEL QUALITY AND SAFE HANDLING

- Samples of Jet fuel
- Clear
- Amber
- Light Straw
- Orange





FUEL QUALITY AND SAFE HANDLING

- Free Water Test (ATA Specification 103 2.5)
- Dry fuel is a prime contributor to flight safety
- Visual detection
- Water sensitive paste or paper
- Hydro kits (Velcon Hydro Kit and/or SHELL water detection kit)
- Page 14 in the Maritime Fuel Quality Assurance Manual



FUEL QUALITY AND SAFE HANDLING

- API Gravity Test (ASTM D 1298)
- The means for measuring the gravity of fuel with a thermohydrometer
- A significant change in gravity may indicate contamination by another product
- The gravity difference from the delivery paperwork and the actual gravity tested must be 1 or less.
- Page 16 in the Maritime Fuel Quality Assurance Manual



FUEL QUALITY AND SAFE HANDLING

- White Bucket Test (ATA Specification 103 2.5)
- The purpose of this test is to visually determine the possible presence of surfactants, water, and/or solids in turbine fuel.
- Fuel sample is taken in a white bucket from the sump drains of filter vessels and tanks, then observed for indications of contaminants.
- The preferred equipment consists of a clean nine-quart white porcelain bucket. No plastic buckets are permitted.
- DO NOT ACCEPT FUEL IF THE RATING IS NOT A “1-A”
- Page 20 in the Maritime Fuel Quality Assurance Manual



FUEL QUALITY AND SAFE HANDLING

Fuel tanks and filters are sumped to remove water and debris that have settled out of the fuel. If contamination is found, continue sumping until the fuel is clear and bright. If the fuel continues to be contaminated after **5** gallons, DO NOT USE FUEL FROM THIS SOURCE

All fuel drained from the sump outlet of any filter, tank, or aircraft drain will be considered contaminated and properly disposed of.

At no time will this sumped or drained fuel be returned to the aircraft or fuel storage tank.



FUEL QUALITY AND SAFE HANDLING

- Filter Differential Pressure (ATA Specification 103.2.9)
- The purpose of observing the differential pressure across a filter vessel is to monitor the changing condition of the filter element
- When fuel passes through a filter, a drop in pressure *should* occur.
- The filter vessel elements should be replaced if any of the following conditions occur:
 - The differential pressure is more than 15 PSI
 - There is a sudden drop in differential pressure

Page 24 of the Maritime Fuel Quality Assurance Manual
