HSAC Recommended Practice (RP) #2004-02

Jet Fuel Quality Control Procedures

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Background

Over the years, HSAC Member Organizations have experienced aircraft engine related events as a result of jet fuel contamination. With this in mind, HSAC has researched industry best practices and procedures and applicable references in the development of this Recommended Practice. This document is intended to provide guidance to the user covering the safe storage and distribution of quality jet fuel as currently practiced in the commercial aviation industry. Due to the wide diversity of fueling operations, this document is not intended be all-inclusive. HSAC members should consider the application of the recommendations in this RP for both design and daily operation of jet fuel systems.

Recommended Practices

1. Responsibilities

a. Pilots and Helicopter Operators

1) Hazard/Non-Conformity reports should be submitted for any fuel system defects and follow-up actions initiated.

2) Verify before fuel is used that the quality control checks have been completed.

b. Fuel System Owners or Operators

1) Ensure a written quality control system covering the minimal requirements in this RP and applicable references/regulations is provided. Included should be necessary forms /checklists used in the routine system checks.

2) Before approving installation of new fuel systems, review the applicable specifications in the list of references at the end of this document and review the plans with the helicopter operator/Aviation Advisory personnel.

3) Coordinate inspection of all fuel systems, ensure defects are remedied and hazards reported to helicopter operators.

4) Ensure properly qualified personnel perform quality control checks and refueling operations.

2. Fuel System Operation Inspection Interval and Inspectors

a. All refueling systems should be inspected annually as a minimum using an appropriate checklist (sample attached to this text).

b. These inspections may be completed either by the helicopter operator or Aviation Advisory personnel, who also develop follow-up actions to remedy any discrepancies.

3. General System Guidelines

a) All fuel delivery systems are required to have a filter/separator equipped with a water defense system that will stop fuel flow or alert operating personnel when actuated by high water level.

b) Fuel filter canisters should be clearly marked with the next date of change or inspection cycle and data recorded in an appropriate inspection record.

c) All filters should be replaced at nominated pressure differentials as annotated on the filter housing or as recommended by the manufacturer, but should be replaced annually.

d) All fuel storage supplies should be allowed to settle 1 hour for each 1 foot of fuel depth before use and samples are taken and checked for water content. When fuel transport tanks have been allowed to settle for 1 hour per foot prior to transfer, no additional settling is required for the main tank.

e) All steel tanks should be lined with an approved epoxy liner unless the tanks are constructed of stainless steel and the preferred tank design should include floating suction.

f) All fuel supply tanks should be installed with a slope and have a sump drain at the tank low point for sampling purposes and a method of checking fuel quantity.

g) The preferred plumbing for fuel systems is stainless steel and connections welded.

h) All fuel system static grounds should have continuity checks performed annually as a minimum.

i) It is recommended that frangible "witness" seals be used on transport tank openings after filling, to allow verification that contents are untampered.

4. Fuel System Sampling Guidelines

a) All required fuel samples should be completed prior to first refueling of the day.

b) Each of the following should be sampled into an appropriate container and checked for water or other contaminates: Tank sump(s), filter(s), and fuel nozzle(s).

5. General Fuel System Maintenance and Documentation

(The following items should be documented in fuel system quality control records.)

a) **Daily –** A Daily Log will be used to record the following items:

1) Sample and water inspection results from fuel tank sumps, all filters/monitors, and fuel nozzles.

2) Differential pressure readings, if installed.

b) **Annually**

1) The interior of all tanks, tank seals, and pressure relief valves should be inspected, all gauges/ pressure relief valves should be calibrated (unless the manufacturer specifies differently) and fuel filters changed.

2) Tanks, when inspected, should include a check for build-up of sediment or evidence of microbial growth. If the tank has an internal epoxy coating, inspect coating for evidence of chipping, flaking, or other deterioration. Maintain a record of tank inspection and cleaning using ATA Form 103.01D or similar form.

c) **Hoses –** All aircraft refueling hoses should be marked as complying with the specifications of API 1529 and maintained in accordance with the hose manufacturer specifications.

d) **Portable Offshore Fuel Transport Tanks –** Information on transporter tanks may be obtained from the Code of Federal Regulations (U.S. CFR 49, Part 173.32 and Part 180). A 5-year hydrostatic test is required on the transporters. The data plate on the tank should state the test pressure requirement and the tank should be appropriately marked for Jet Fuel use.

Reference Publications

- ATA Specification 103 Standards for Jet Fuel Quality Control at Airports
- NFPA 407/30A Standard for Aircraft Fuel Servicing/Flammable and Combustible Liquids Code
- Oil and Gas Producers (OGP) Aircraft Management Guide
- API/IP 1581 and 1583 Specifications and Qualification Procedures for Aviation Fuel Filter/Monitors with Absorbent Type Elements and for Aviation Jet Fuel Filter/Separators
- ASTM D1655 and D1298 Standard Specification for Aviation Turbine Fuels and Standard Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- 46 CFR and 49 CFR
- DOT Federal Motor Carrier Safety Regulations
- FAA Advisory Circular 150/5230-4 Aircraft Fuel Storage, Handling, and Dispensing on Airports