AMD-35A
(04/10)

Interagency Aviation

Lessons Learned

No. IA LL 12-01 **August 28, 2012** **Page 1 of 2**

Subject: Aircraft Fuel

Area of Concern: Fuel Contamination

Distribution: All Aviation Activities

Discussion: In June of this year, an engine failed as the pilot was taxiing a float configured aircraft for takeoff. Unable to restart the engine, the pilot sumped one wing drain and found the sump cup to be full of water. After paddling back to the dock, the pilot proceeded to drain over one half gallon of water from the wings, aft fuel drain and strainer.

The pilot had refueled at the bureau's fuel tank just prior to the incident. The government managed fuel system used to service the aircraft had been left empty during the winter as a result of stringent procurement policy that deemed refueling the tank as not mission critical. The absence of fuel created an environment where water condensed and collected in the empty tank and filter vessel during the period of inactivity (Fall, Winter, Spring). Additionally, the filter vessel was not sumped prior to initial use[1], nor were the aircraft fuel tanks sumped after refueling[2].

Lessons Learned:

1. Water will accumulate in fuel systems naturally through condensation.
2. Water requires removal from fuel systems as it accumulates. Filter manufacturer's operating procedures stipulate a requirement that filter sumps be drained daily before use.
3. Water possesses the unique ability to pass through water absorbing media. The fuel system filtration in this event is specifically designed to absorb and remove water from the fuel. The media did not perform as expected as it had been compromised by a combination of inactivity and subsequent water accumulation in the sump.
4. The filter media does not completely stop fuel flow when water is absorbed however it will produce a noticeable reduction in flow rate. The designed flow rate for this system vessel/filtration combination is 50 gallons per minute and the actual flow rate (in this instance) was reduced to 9 gallons per minute.

[1] Velcon Service Bulletin 1839-R17 Operation of Vessels Containing Water Absorbing Cartridges (ACOACI/CDF) for Aviation Fuel

[2] FAA Advisory Circular AC-125 Water in Aviation Fuels

1. Check fuel storage tanks periodically for water accumulation. Remove water greater than ¼" accumulation.
2. Sump filter vessels daily before use per the manufacturer's instructions.
3. Re-fill storage tanks after each refueling if possible.
4. Sump aircraft fuel tanks after each refueling.
5. Assume fuel flow reductions are related to filter loading versus pump suction problems.
6. Design fuel systems to match anticipated requirements. For example, most small aircraft that are fueled over-wing average a rate of approximately 25 gallons per minute maximum to which the tank system should contain filters that are able to meet or exceed this requirement.
7. Have a certified fuel quality control/tank inspector evaluate the aircraft fueling system's design and operating procedures to ensure it meets fuel quality standards.
8. Purge the system if its been unused for a significant period of time - when in doubt, assume it has. Methods include recycling the fuel through the pump and filter system back into the tank. Many times the water or loose scale within the tank will be picked up and caught by the filter. Recycling back into the bulk tank ensures that any particulate or foreign matter is kept from entering the aircraft's tanks.
9. The filter element should be changed on a regular basis. Scheduling this maintenance function and documenting its occurrence will inform other users as to the systems readiness and condition.

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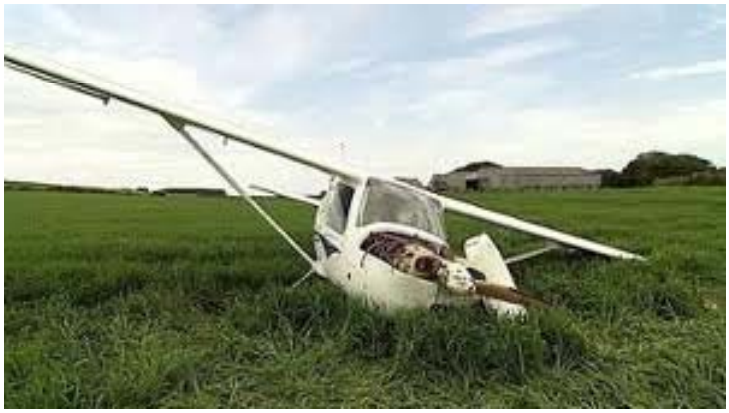

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