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 it’s 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.

/s/ Keith C. Raley
__________________________
Keith C. Raley
Chief, Aviation Safety and Program Evaluation, OAS

/s/ Ron Hanks
__________________________
Ron Hanks
Branch Chief, Aviation Safety Management Systems, USFS