FLYING LESSONS for October 23, 2008

suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports as the jumping-off point to consider what *might* have contributed to accidents, so you can make better decisions if you face similar circumstances. In almost all cases design characteristics of a specific make and model airplane have little direct bearing on the possible causes of aircraft accidents, so apply these *FLYING LESSONS* to any airplane you fly. Verify all technical information before applying it to your aircraft or operation, with manufacturers' data and recommendations taking precedence.

FLYING LESSONS is an independent product of MASTERY FLIGHT TRAINING, INC.

This week's lessons:

Fuel starvation (running the selected tank of fuel dry while other tanks still have fuel on board) can result from any of several scenarios:

- The pilot does not plan to have adequate fuel to reach destination on either tank independently, and does not properly time switching between selected tanks.
- The pilot does not confirm fuel level through all means necessary before flight, and assumes the tank has more fuel on takeoff than it actually does.
- Wind reduces ground speed below what the pilot planned, and the pilot does not recalculate fuel reserves en route.
- The pilot attempts descent and landing with an auxiliary fuel tank selected, which is against the recommendation of virtually all aircraft manufacturers and STC holders.
- During tank selection the fuel selector does not go firmly into the tank detent, cutting off fuel flow.
- The pilot does not manage power and fuel flow in the manner he/she planned, resulting in higher fuel flow than expected.
- Fuel siphons from a tank in flight and it no longer contains the amount of fuel the pilot thinks it does.

To guard against interruption of fuel flow most Pilot's Operating Handbooks direct selecting the fullest tank for landing. I teach making that selection at the top-of-descent (just before beginning descent from cruise), picking a tank with adequate fuel for descent, landing, go-around or missed approach, and climb to a safe altitude without further selections. I'm *not* a fan of the classic GUMPS check *only* because "G" for Gas suggests making a fuel tank selection (not just confirmation of the selected position) in the airport traffic pattern. I acknowledge that if **verification, not selection** is emphasized, that GUMPS is a useful prelanding check.

It's not uncommon in some aircraft types for a delay in restarting the engine when a tank is run completely dry and the selector valve then moved to another, fueled tank.

If you can't plan your flight to have enough fuel in a tank for descent, approach, landing and go-around/missed approach at top-of-descent, in my opinion, you have not adequately planned your flight and en route fuel stops.

Switching fuel tanks is a three-part process:

1. move the fuel selector handle,
2. wiggle it slightly to make certain it is firmly in the fuel tank detent, and
3. leave your hand on the selector handle for several seconds while watching the fuel flow/fuel pressure gauge. If flow begins to drop, switch back to the previously selected tank to keep the engine running until you confirm you have fuel in the tank you've *tried* to select, and can again attempt to switch tanks.

Although the industry standard in almost all airplanes is to have independently selectable fuel tanks, in part for system redundancy should one tank become contaminated, safety might be better served if a "both" or "all" tanks position was the standard with the option of individual tanks selection. This is the configuration in most Cessna single-engine airplane, and the relative lack of fuel starvation mishaps in Cessnas shows this works. We all must work with whatever tank configuration we've got.

If a fuel cap comes loose the low pressure created on top of the wing in flight can causes significant siphoning and loss of fuel overboard. Float-type fuel gauges may not report the extra fuel loss, as the suction that pulls fuel out may also hold fuel floats in the full-up, fully-fueled position. Such losses would not be reflected in fuel totalizers or other integrated fuel management information; as far as a totalizer or glass cockpit GPS interface knows, if the fuel doesn't go through the injection system transducer, it's still on board the airplane.

Include a scan of the fuel caps in your Climb checklist, to see if there's any sign of fuel leakage from the filler caps. If you're flying a high-wing airplane, look for any signs of fuel spray from the trailing edge of the wing, behind the fuel caps. If fuel is leaking, land as soon as practical and refuel, as that's the only way to confirm how much fuel actually remains on board.

Questions? Comments? Send me a note at mastery.flight.training@cox.net.

Transport aircraft *FLYING LESSONS*

FAA this week unveiled a **Lessons Learned from Transport Airplane Accidents** website. The goal (as it is here at *FLYING LESSONS*) "is to populate the material with many more of the most historically significant, policy shaping accidents, in order that the lessons that can be learned from their review." Take a look and see how many of these lessons might apply to the airplane and operations *you* fly.

See http://accidents-ll.faa.gov/.

Fly safe, and have fun!
