FLYING LESSONS for December 24, 2009

suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports 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.

If you wish to receive the free, expanded *FLYING LESSONS* report each week, email "subscribe" to mastery.flight.training@cox.net.

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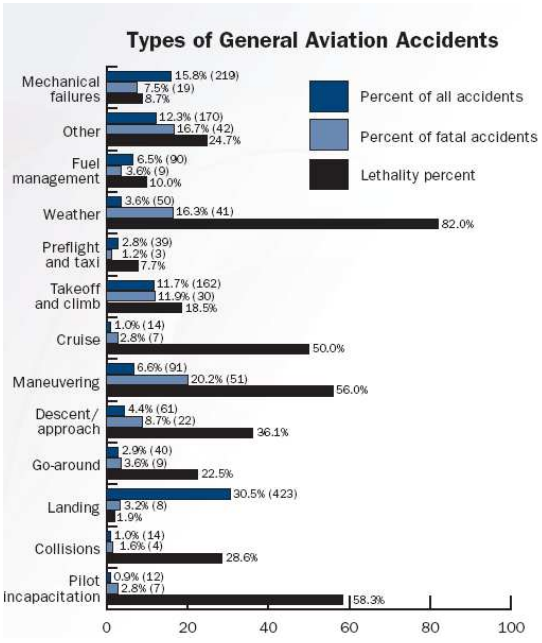
This week's lessons:

Thoroughly preflight your airplane for the environment in which you'll fly. In addition to the standard preflight inspection, if you're flying at night, include a check of all exterior lighting, interior lights and the location and function of flashlights and any other aids you may need. If you'll fly at altitudes near or below freezing temperatures—even if you don't plan to enter visible moisture or precipitation—check the function of any (and all) anti- and deicing equipment. This includes a an external check of heated items like pitot tubes, stall warning vanes, heated fuel vents and angle of attack sensors as appropriate to the airplane.

Don't let a little wiggle of the ammeter or alternator load meter convince you the electricity is doing its job. Briefly turn on each device, exit the airplane and carefully feel each heated item to confirm that it warms. Turn them off unless needed on the ground or until you take the runway for departure, as anti-ice equipment may overheat without cooling air flow.

Low-altitude maneuvering accounted for only 6% of all NTSB-reported accidents in 2008, but slightly over 20% of all fatal events, according to the AOPA Air Safety Foundation *Nall Report*. More than half of all maneuvering accidents are lethal—ASF gives them a 56% "lethality index." "Maneuvering" encompasses a lot of, well, maneuvers, but in general in includes climbs, turns and descents other than those required for "normal" flight operations.



Accidents, fatal accidents and lethality indices, 2008 (AOPA ASF *Nall Report*)

See www.aopa.org/asf/publications/08nall.pdf.

Consider these two recent videos that show success—and failure—in low-altitude maneuvering with unique real-world data:

- An *AVweb* video report presents the reconstruction of a Cirrus stall while turning in the traffic pattern, with animation created from data downloaded from the airplane's "glass cockpit" recorders.
- An AOPA "Pilot Stories" features in-cockpit video of a Mooney whose pilot made it back to the runway after its

engine lost partial power immediately after takeoff.

See:
www.avweb.com/avwebflash/exclusivevids/ExclusiveVideo_AviationSafety_Cirrus_StallAccident_Dissected_201722-1.html
http://flash.aopa.org/asf/pilotstories/impossibleturn/index.cfm

Did the Cirrus pilot make a last-minute change in runway selection that led to his steep bank close to the ground? Did the CFI direct a runway change, or simulate an engine failure (the animation does not discuss power settings as the airplane descended), or otherwise prompt the pilot's action?

Although the Mooney pilot was successful, should we heed his words "Don't do what I did"? Should we take his advice that "I took a chance, and I was fortunate to make is successful[ly]. But, your chance [of success] is much greater just finding a place straight ahead"?

Regardless of the specific circumstances of these two events, the extraordinary visual presentation and (in the case of the Mooney) the pilot's after-action report both serve to remind us that there is still a vital need for solid, practiced and instinctive stick-and-rudder skills even in this glass-cockpit world.

In addition to the avionics training and instrument approach practice that seems to fill almost all our training time in today's high-tech airplanes, deliberately map out a strategy to review and practice basic control coordination, airspeed control, and stall recognition and recovery early in 2010 as you prepare for another year of safe, enjoyable flying.

Questions? Comments? Email me at mastery.flight.training@cox.net

Good advice

AOPA Air Safety Foundation president (and *FLYING LESSONS* reader) Bruce Landsberg blogs eloquent on "getting there for the holidays." Read this before you launch to your holiday gathering this week, and more importantly, as you plan to come back home.

See http://blog.aopa.org/asfblog/.

DEBRIEF: Readers comment on past *FLYING LESSONS*

Reader Bill R. Kendrick writes:

> Tom- I attended the seminar at Denton [Texas] Municipal last weekend. Thanks for the informative presentation.
>
> It's always been my suspicion that many of the incidents in which planes have fuel on board yet fail to make their destination airports are the result of pilots failing to richen the fuel mixture. I was trained to richen the fuel gradually during descent. This method causes me to constantly remind myself to do so and creates less shock to the engine than does dumping lots of cool fuel at one time. Furthermore, this method is part of my philosophy that changes to power settings should be made gradually.

I agree, Bill. The "most correct" method, in my opinion, is to gradually enrichen mixture during descent so that engine temperatures gradually cool, and so the mixture control is at the appropriate position for a go around/missed approach at the field elevation of the arrival airport. "Shock cooling" has been all but debunked as an issue with aircraft engines, but this technique reduces workload for the pilot in the event the approach/landing needs to be aborted, and gets the mixture well on the rich side of peak EGT so power is immediately available if throttle is added for intermediate level-offs or to arrest and excessive rate of descent.

Bill continues:

> You also talked about the GUMPS check. I believe this should be part of the Landing Checklist of every pilot from the first day of training, regardless of the type of plane being flown. My first instructor had me do this, so transitioning to retracts was easy.

Assuming the pilot's goal is cross-country flying (which may someday put him/her in a retractable-gear airplane) or is on a professional pilot training track (which virtually guarantees flying RG airplanes eventually), this is a great technique for developing habit patterns that will last a lifetime. Thanks, Bill.

Circuit protection...protecting *you*

The Federal Aviation Administration this week published Special Airworthiness Information Bulletin CE-10-11addresses resetting circuit breakers after they have popped in operation. According to the SAIB, the current accepted guidance for small airplanes is that no pilot should reset any circuit breaker more than once. This is consistent with my U.S. Air Force training, as well as training I received and then provided at an international flight safety training organization where I once taught. Following the crash of a light airplane FAA blames on an inflight fire in a weather radar that had previously popped its breaker, this SAIB now recommends aircraft owners

1. Mark circuit breakers affecting equipment deemed essential for safety in flight.
2. "Essential" C/Bs should be reset in flight only once, and then only:
    a. after at least one minute;
    b. if there is no remaining smoke or "burning smell"; and
    c. the affected system and equipment is needed for the operational environment.
3. Do not reset any non-essential C/Bs in flight.
4. Revise the preflight checklist to delete "Circuit breakers-In" if applicable and insert: "Check circuit breakers and if a circuit breaker is not set, do not reset the circuit breaker if there is a related maintenance malfunction."

SAIB CE-10-11 provides guidance on what should be considered "essential" equipment:

1. Any electrical loads unique for the airplane characteristics and needed for continued safe flight and landing for the intended operations.
2. If needed to comply with 14 CFR §§ 23.1323 and 23.1325, one airspeed indicator with a heated pitot tube and an altimeter with either a heated static pressure source or an alternate static pressure source.
3. The magnetic compass and any display necessary for continued safe flight and landing that is sufficiently illuminated for night operation.
4. One navigation system installation appropriate to the ground facilities.
5. One communication installation system.
6. One gyroscopic pitch and bank indicator.
7. One clock.
8. Any display for the powerplant parameter necessary for continued safe flight and landing.

Any circuit breaker not meeting these criteria should not be reset before maintenance. Pilots and mechanics finding tripped circuit breakers during inspections on the ground should not reset the breaker until determining and addressing the cause.

SAIBs are issued for situations the FAA determines do not warrant issuance of an Airworthiness Directive, and are therefore advisory and not mandatory.

See http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/(LookupSAIBs)/CE-10-11?OpenDocument.

More free safety information

The Cirrus Owners and Pilots Association (COPA) has made great strides in improving pilot proficiency and decision-making skills, vastly reducing the accident rate for "type" owners who

participate in COPA-managed training. This month COPA's *Cirrus Pilot* magazine offers its annual safety issue free online. We can all learn from the insights of this superb safety organization.

See www.cirruspilots.org/content/FreeSafetyIssue.aspx.

FAA Aviation News presents Barry Ballenger's article "Plane Poison: The Dangers of Carbon Monoxide," in the November/December 2009 issue of *FAA Aviation News*. Ballenger urges pilots to take extra time to inspect the airplane's heating and defrost system during preflight. "Look for signs of deterioration, such as cracked or distorted components, torn flexible ducting, or loose or missing hardware," adds Ballenger. "Taking a few extra minutes to preflight exhaust system components may save your life."

See www.faa.gov/news/aviation_news/2009/media/NovDec2009.pdf.

The brand-new FAA Instrument Pilot Practical Test Standards clarifies and adds tasks and examiner guidance on icing hazard recognition and the use of ice protection equipment, managing cockpit automation and Single Pilot Resource Management (SPRM). *FLYING LESSONS* will take a closer look at the new IFR PTS in coming weeks, including how these changes affect FAA requirements for the conduct of Instrument Proficiency Checks, and what they suggest for pilots not subject to FAA regulation.

See www.faa.gov/training_testing/testing/airmen/test_standards/media/FAA-S-8081-4e.pdf.

Do you have a question or comment? Email me at mastery.flight.training@cox.net.

Fly safe, and have fun!

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2008 FAA Central Region CFI of the Year