

FLYING LESSONS for August 12, 2010

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:

It's often said that multiengine training is the most hazardous flight instruction conducted in civilian airplanes. It's a fact that when thrust is not symmetric that the airplane will tend to diverge from controlled flight simultaneously in all three axes—yaw, pitch and roll—and it requires prompt and correct action to maintain control.

The greatest hazard lurks near the slow end of the speed range. But it doesn't need to be as slow as many multiengine pilots may think. V_{mc} speed, for instance, is published based on up to five degrees bank and up to one-half slip/skid ball into the good engine.

Fly at a different bank or rudder position and the airplane will slip or skid, with extra performance-robbing drag from air striking the side of the fuselage.

Further, for every degree of bank angle away from optimum increases V_{mc} speed by as much as *three knots*. In other words, if your airplane gets best single-engine performance with the maximum certificated five degrees into the good engine, flying wings-level on one engine will increase V_{mc} speed by 15 knots. In some airplanes this puts V_{mc} fairly close to the published Vyse ("Blue Line") speed.

Deceleration in simulated single-engine flight should follow the same standard as deceleration for stalls—one knot reduction per second. This is a lower rate of speed loss than many pilots perform stall (or engine-out) practice...making the exercise less controllable and more dangerous.

Instructors, control the exercise. You are the safety valve, the quality control and the person in charge, even if you're not the sole manipulator of the controls. Practice patience as well as instructional excellence, and insist that your students conduct practice and demonstrations in this same way.

Does this mean we're not training for real-world engine-out scenarios in twins? Frankly, yes. We can safely demonstrate an *approximation* of what will happen if an engine quits. And we can practice the *aftermath* of maintaining control through "identify, verify, feather."

But at takeoff and climb speeds it's foolhardy to reach up and haul back on the throttle, or (if you really live on the edge) use the old-school method of pulling the mixture or shutting off the fuel valve to simulate engine failure.

Safely practicing realistic engine failures at liftoff or initial climb speeds requires ground-based simulation in a device designed to accurately reflect airplane performance.

In other words, practice terminal-environment engine failures in a flight training device or simulator. Safely practice engine-out maneuvering in flight with slow entries into the single-

engine regime, then exploring control of pitch, bank, and yaw to gain experience in what it takes to get maximum performance out of a multiengine airplane with power loss on one engine.

Controlled Flight into Terrain (CFIT) accounts for 17% of all general aviation fatalities, according to the FAA's [Advisory Circular 61-134](#).

See www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/22907

A single-pilot GA aircraft is vulnerable to the CFIT risks. With only one pilot to perform all of the flight and decision-making duties, that pilot must be better prepared to avoid a CFIT accident. A GA pilot may be more at risk of certain CFIT type accidents because the pilot does not have the company management or government oversight of a corporate or commercial operator.

Most of the FAA's Top 10 Recommended Intervention Strategies for avoiding CFIT events, listed in the 2004 Advisory Circular, are now readily available in many airplanes. Here's the list:

1. Increase pilot awareness on accident causes.
2. Improve safety culture within the aviation community.
3. Promote development and use of a low cost terrain clearance and/or a look ahead device.
4. Improve pilot training (i.e., weather briefing, equipment, decision-making, wire and tower avoidance, and human factors.
5. Improve the quality and substance of weather briefs.
6. Enhance the flight review and/or instrument competency check.
7. Develop and distribute mountain-flying technique advisory material.
8. Standardize and expand use of markings for towers and wires.
9. Use high visibility paint and other visibility enhancing features on obstructions.
10. Eliminate the pressure to complete the flight where continuing may compromise safety.

Instruction on the items on this list would make a superb Flight Review or FAA Safety Team presentation.

Ultimately it's a matter of the pilot picking a route that takes obstacles into account, pre-planning minimum safe altitudes for each segment of the flight, and once aloft tracking the flight's precise location using charts, electronic nav aids and/or moving maps.

If flight conditions require the flight to descend below the pre-established minimum safe altitude for the current location, *immediately* change course toward lower terrain and, if you don't have a preplanned alternate routing that permits passage at or above your preplanned minimum safe altitude for that alternate route, landing as soon as practicable to wait it out until conditions improve.

Comments? Questions? Tell us what you think at mastery.flight.training@cox.net.

Is <i>FLYING LESSONS</i> valuable to you? If you wish to donate to help <i>FLYING LESSONS</i> get even better you may do so through a secure Paypal button or by mailing a check to the address at www.mastery-flight-training.com . Thank you!

Debrief: Readers write about recent *FLYING LESSONS*

The discussion on ELTs, personal locator beacons and post-crash signaling continues:

Jim Herd, who began this, the longest continuous thread in the history of *FLYING LESSONS*, checks in to say:

I believe this is one of a short list of critical topics that we all must take very seriously – along with 100LL, ADS-B, etc. Your newsletter is a very useful vehicle to advance all of these topics so I urge you to continue to give them a lot of column inches.

Thanks, Jim. And reader Gus Gillespie suggests:

A signaling mirror is perhaps the most basic safety device, but highly effective. An old CD makes an excellent signaling mirror. I always keep one in my flight bag.

Rock the CD (a DVD works, too <g>) back and forth with the shiny side toward the searchers, aiming through the hole in the middle.

Doug Cheney revisits our recent *LESSONS* on fuel siphoning:

Speaking of fuel siphoning, I had something happen to me a couple weeks ago while on the ground that completely got my attention on this issue. Was ferrying an AMD Zodiac 601XL (low wing; SLSA in this case). While refueling I accidentally over-filled one wing and put the fuel cap on. While pushing it away from the fuel pump fuel started hosing out of the vent. I do mean hosing! This was not just a stream. I am not very familiar with this aircraft and assumed it was just a pressure bubble working its way out of vent system but it didn't stop. I pulled the fuel cap off to a significant whoosh of vacuum. Easily a gallon had vanished in the ~40 seconds fuel was coming out. Seems odd that fuel would gush out so fast while pulling a vacuum. Haven't yet gotten my hands on a diagram of the vent system so not yet sure what the deal was. The fuel selector in this plane has only left, right and off positions so wasn't a case of uphill wing pressurizing downhill wing.

Makes me wonder if there are some basic scenarios such as my over-fill case that routinely lead to fuel siphoning and more importantly, are there some routine preventative actions to take after doing something like over-flowing a tank.

Any guidance, readers?

Not just for Cirrus pilots...

Cirrus Design and the Cirrus Owners and Pilots Association have responded to a number of basic "stick and rudder" landing-regime accidents in Cirrus SR20 and SR22 airplanes. Given typical FAA accident reports, [Cirrus' advice](#) applies equally to pilots of *all* airplane types. Cirrus is

asking each of you to review the basic information on how to manage your aircraft in all phases of flight. Please re-read your *Pilot's Operating Handbook*, Section 2, Limitations, Section 3 Emergency Procedures, and Section 4, Normal Procedures. Also, review Section 3, Standard Operating Procedures.... Look for expanded guidance on normal operating procedures with **special attention to approach stability, traffic patterns, landing procedures and go-around.** [emphasis added—MFT]

Second, we are requesting each and every one of you to conduct a currency flight. All company pilots for Cirrus Aircraft follow a structured safety program (in sales, training, and flight operations) – and our safety record shows that it works. We are requesting that all...pilots conduct a currency flight with a qualified...Instructor Pilot...regardless of your total PIC time, time-in-type, or years of successful flight. This is the best way for all pilots to identify and correct bad habits that may have slipped into our routines over time.

As newly appointed *FLYING* Magazine editor-in chief (and *FLYING LESSONS* reader) Michael Maya Charles relayed to me on the phone today, "it's all about stick and rudder"—even in Technologically Advanced Aircraft. No matter what you fly, take Cirrus' excellent advice, and schedule some basic airmanship practice today.

See www.mastery-flight-training.com/cirrus_safety_alert.pdf

Question of the Week

Thanks to all who have provided insightful answers to our four-part question that addresses the instructional approach of *FLYING LESSONS*. It's always healthy to challenge your assumptions, so let's see what readers had to say about Question #1, which is...

1. **When we review accident records in print and discussion do we risk portraying our entire industry as excessively risky?**

- No.
- I have never had that thought; I attempt to put myself in the place of the accident pilot/crew and attempt to learn from their actions/mistakes. There is a saying (I cannot repeat verbatim) that conveys the following: "WE AS PILOTS CANNOT MAKE ALL THE MISTAKES THEREFORE WE MUST LEARN FROM OTHER'S MISTAKES/ACCIDENTS."
- It's not a question of whether, but rather of how the mishaps are presented. An analogy to disease may be helpful. I dislike thinking about cancer and heart attacks, but they are, like aircraft mishaps, facts, and knowing about them helps me take steps to avoid them. We do ourselves no favors by ignoring threats to our health regardless of their source. That said, thoughtful health professionals do not berate their patients or scare them unnecessarily. A discussion about the facts of the matter and what one can do to stay healthy is a first step in staying well. Likewise, we in the aviation community need to face the facts, but not as defeatists. Rather, as you note, most aircraft mishaps result from pilot error. We are the pilots; they are our errors, and they occur far too often. Understanding the problem of pilot error is akin to diagnosing a (widespread) disease. Acknowledging that disease is a first step to preventing it.
- On the contrary, the self-revelatory "I learned about Flying from This" mentality fosters learning from someone else's experience. On the contrary, despite probably thousands of articles on gear-up landings, they continue to happen at an unacceptable rate. I'd rather learn from someone else's experience than make all those mistakes myself. As a physician, I'm used to peer review and case management conferences that sometimes become "come to Jesus" exercises. Taking on two issues: running a perfectly good airplane out of gas while still in the air and the gear-up: if we could impact just those two, think of the money we could save.
- No.
- No, I'm sure the vast majority of your readers are pilots, the general public already thinks we are nuts to fly those little airplanes. Nothing will change their minds.
- I don't believe we portray our industry as dangerous to the public by publicly analysing accident reports, in fact, just the opposite. I feel strongly that the general public appreciates the candor, and the will to improve the record.
- Of course. Many companies (and families) restrict key people from all flying on the same plane, even on commercial airlines. Yet how many of those are perfectly comfortable with them riding in the same car? I've met far too many pilots whose spouses won't fly with them, or won't let their kids fly with them. Many have quit flying because of it. This perception of danger is not helpful to an industry in decline.
- If *FLYING LESSONS* [is] read by large numbers of other than aviation-related people, my reply would be YES.
- Yes. But that's no reason not to do it.
- Yes.
- No. These discussions should be done in aviation related venues. If the general press reports on these, so be it. Aviation's analysis can only be construed as risk management much like it is in the medical profession.
- I believe all pilots understand that flying is riskier than many activities on the ground, driving race cars being one obvious exception. So my goal is to continually attempt to refine my ability to accurately identify and evaluate the risks I encounter while flying. It is that area where reviewing accident records pays off for me. Unless we are willing to review and evaluate the actions and mishaps of others, we our judgment is limited to what we have experienced personally. Said differently "We don't know what we don't know". As I review the accident reports, I attempt to put myself in the place of the pilot and ask, what was he or she thinking when they made the decision to handle the situation in that particular way. "Would I handle it differently?"
- NO! On the contrary, it shows dedication to development, whether it be in design or pilot skills.

Thanks for the responses! There's still time to chime in on these related questions, at mftsurvey@cox.net:

2. **Do you believe flying is inherently dangerous, requiring constant study and practice to be an acceptable risk?**
3. **Does *FLYING LESSONS* go too far in presenting lessons to be learned from the mishap record?**
4. **Can we accomplish the same thing (avoiding repeats of common accident causes) differently, and if so, how?**

I'll continue featuring your answers to each of the four questions next week in *FLYING LESSONS*. Thanks, readers!

Fly safe, and have fun!

Thomas P. Turner, M.S. Aviation Safety, MCFI
2010 National FAA Safety Team Representative of the Year
2008 FAA Central Region CFI of the Year



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