

FLYING LESSONS for February 18, 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:

Through your windscreen, the runway rolls into view...growing by the instant with your extreme approach. Your airspeed indicator spirals upward and, in seconds, you race along a few feet above the pavement, a smile on your face and the look of amazement from your passengers. The end of the runway rushes to meet you as you haul back on the controls. Rolling into a steep bank, you complete what I call the "airshow pass"—a classic high-speed flyby and steep, turning pull-up flown by dozens of pilots each day during the summer fly-in season.

The crowds love the airshow pass too. They can vicariously feel the rush of speed, sensed through the rumble of your engine, the whine of your propeller, and the flash of your passing. The pull-up and bank maneuver spotlights the capabilities of your airplane, and spectators wish they too could master your craft. Yes, the airshow pass is a staple of fly-ins everywhere and it is perfectly safe—most of the time.

According to the U.S. National Transportation Safety Board (NTSB), there is an average of 51 accidents attributed to botched attempts at the airshow pass each year. What goes awry so frequently? What can you do to reduce your chances of repeating accident history?

Over 90% of the airshow pass accidents involved single-engine, fixed gear airplanes. However, that doesn't mean retractable-gear and multiengine airplanes are immune to the stall/spin on pull-up, despite their typically greater power and cleaner aerodynamics. In fact, more twin-engine airplanes are involved in airshow pass mishaps historically than single-engine retracts. [What may have been an airshow pass](#) attempt this week killed five people in a Cessna Skymaster.

See <http://abclocal.go.com/wabc/story?section=news/local&id=7278582>

Only about 14% of the total airplanes involved in this type of mishap are normally considered to be aerobatic—such as Pitts, Stearmans, or P-51s. I imagine that 14% is representative of the aerobatic aircraft population at most air shows. Translation: No pilot, and no airplane type is immune.

- **99.5%** of the airshow pass accidents resulted in "substantial damage" or destruction of the airplane.
- **47%** of these mishaps proved fatal and in these cases, a great number of innocent passengers and spectators died as well.

What can you do to avoid falling victim to the airshow pass? It might be unrealistic for me to advise you to stop thrilling yourself, your passengers and your spectators by advocating abstinence from the low pass and pull-up. Instead, I'll advise that, *if you must fly the maneuver*, you train and practice to recognize and recover from incipient stalls, and therefore to avoid the primary threat:

- Take an introductory aerobatics course to learn what works, and what doesn't.
- Practice recovery from stalls in various airplane configurations. Do this at a safe altitude, preferably with an instructor who is well versed in your airplane's stall characteristics. Try a few chandelles to sample the transition from climb to minimum controllable airspeed in a turn.
- Simulate the airshow pass at a safe altitude by diving at a designated altitude, roaring along level for a while, then pulling up into a climbing turn. Note the airspeeds, pitch, attitudes and angles of bank that look spectacular, yet keep you far from the edge of a stall. Pay special attention to the altimeter—at altitude, missing your mark by 30 feet is relatively benign. The ground is not so forgiving.
- Change the parameters (reduce airspeed, pull up more steeply, or bank more sharply) one at a time until each action alone causes the beginnings of a stall. Recover, then record the precise values that put you on the edge of a stall. Then start varying two of the three parameters, to learn how control inputs interact and how your airplane reacts.
- Practice recoveries from incipient stalls. Then, once you've mastered positive control of all parameters independently and in pairs, try going to the edge of the stall envelope by varying all three.

After completing this regimen, you should be able to safely fly the maneuver by knowing exactly what values of airspeed, pitch attitude and/or bank angle keep you inside the airplane's performance envelope.

WARNING: Military and aerobatic pilots know the dangers of "rolling" g-forces. An airplane stressed for a particular g-load may not be able to withstand that stress if the load is applied during a roll. Remember, roll, then pull, or pull, then roll. Don't "load up" the airplane at the same time you're rolling into or out of a turn.

And a regulatory interpretation: Since the airshow pass is a violation of minimum altitude and/or distance from persons or man-made objects rules that is not conducted for the purpose of taking off or landing, it's my interpretation the maneuver is illegal except in Class G airspace well away from people and objects. Urban legend says pilots have cited for this violation, and careless and reckless operation, as a result.

Diving at the runway, flying along low at high speed, and climbing above the crowd provides a rush of adrenaline for you and those who watch. Done right, it's a fine display of airmanship and an airplane's grace and agility. Unfortunately, the airshow pass destroys a number of airplanes and kills a lot of people each year. If you must try the maneuver, make sure you've logged the training and practice that will make you and those around you safe. Otherwise, leave the airshow pass to the professionals.

This FLYING LESSON was adapted from [an article](#) I wrote in 2001 that appears on www.ipilot.com. See: www.ipilot.com/learn/article.aspx?ArticleID=258.

A reader's *FLYING LESSON*

Hi, Tom: I read your *FLYING LESSONS* each week with an eye to avoid being on it in the future. I'd like to suggest a topic that happened to me this past summer. I had an exhausting day, did a long run, made a short flight to visit my son in Ann Arbor (Michigan), attended the afternoon football game in the hot sun, and then flew to St. Ignace Michigan (83D) at 6pm. It was about a two and a half hour flight, VFR. It was pretty humid, but after dodging a few showers, it was mostly clear.

I was on autopilot, but could not see the airport beacon until I was right on top of the airport. I learned later that "no one approaches from the south...because the beacon is now below the tree line on that side of the airport." Winds were light and out of the east, and I tried to get my Beech Bonanza down on runway 07, but it just didn't feel right. I looked to be going long, so I powered up to go around. It was right about then that I realized that I did not know what the minimum safe altitude was! There was no PAPI or VASI, even though the airport guide shows St. Ignace has them. There was no NOTAM for being out of service. I'm used to flying out of a Class D airport.

If you've ever flown in northern Michigan, it is pretty dark and the tip of the Upper Peninsula is even more so. I have been working toward my instrument training, so relied on my instincts to climb and circle back around, trying not to descend while also trying to not lose sight of the runway again. I made a successful landing after the go-around, but it taught me a valuable lesson: *Do not fly tired, call ahead to unfamiliar airports, and make sure I know what the minimums are, even if flying VFR.*

When I departed a few days later, I realized the airport is in a bowl with tall trees all to the west. I must have been pretty close to the tops of them. I'll never be tired and unprepared again, to an unfamiliar airport.

The reader wished to remain anonymous...so thanks, reader!

Debrief: Readers write about recent *FLYING LESSONS*

Last week *FLYING LESSONS* discussed checklists. Reader Mark Briggs writes:

It's great to see some energy focused on the checklist done at the hold-short line - too many folks don't take a hold time to perform a critical review while waiting to take the runway. On a personal level, I've always had troubles with using FLATS as an acronym because when I switch airplanes from less complex to more complex aircraft I've found that I forget how many F's to add at the beginning. I never seem to miss Fuel and Flaps, but sometimes Cowl Flaps get forgotten, much to my chagrin. Thankfully they're part of the runup check so my oversight normally has no safety repercussions, but I'm still working on finding a better acronym to help avoid such an oversight. Nothing's perfect, and the basic FLATS acronym is quite good. I'd welcome hearing about any better acronyms that might be out there.

Readers, any ideas? Send them to mastery.flight.training@cox.net. Mark continues:

Also, one fellow I flew with modified FLATS to read R-FLATS. Why the "R"? Well, before you perform the "taking the runway" check you want to make sure you're going to take the correct runway, that it's the one for which you're cleared, that it's into wind, that it's long enough and that you've briefed appropriately for engine failure should the big fan up front quit turning shortly after takeoff. I've also started to preface FLATS with the big "R" as I feel it offers a means to provide a critical flight safety improvement.

Reader Andrew Reardon adds:

Tom, thanks for yet another great article regarding the departure checklist. One additional practice I employ in my Beech Baron when bringing the engines up to takeoff power is to glance at the fuel flow and the EGT indicators, checking for a loss or reduction in fuel flow. Typically, if there is a problem with a loss of power in the takeoff and climb regime, it is frequently related to a loss of fuel flow, engine-driven fuel pump, etc., and will be reflected in those indications.

Thanks, readers. For more on procedures once you've moved into takeoff position, read about [Takeoff Targets](#) (you'll need to register for free access to the www.ipilot.com Insider Series)

See www.ipilot.com/learn/article.aspx?ArticleID=778

Instructor David Dewhirst transitions a lot of pilots into heavier airplanes, and redirects a past *FLYING LESSONS* Question of the Week:

Let's take your question [about recurrent training at high gross weights] and ask it a slightly different way. What should we do for transition training on the subject of operating an airplane at gross weight? It depends on the pilot and the airplane. For a seasoned pilot in an airplane similar to the airplanes in his history, there is no special need. However when we take a low-time pilot and transition him to an airplane with a large capacity cabin we need [to] add an element to the transition routine.

The pilot encountering an airplane with a large useful load needs to see the difference between operation at light weight with forward CG, and operation at gross weight and aft CG. Take a Cherokee-Six, for example. The pilot by himself with one hour [of] fuel will consider the airplane a rocket. Load the airplane up to max weight and aft CG and the pilot will discover the airplane to be a dog. It will take a lot of runway, have poor climb capability, have a lower altitude available for cruise, and [exhibit] different pitch forces. The same thing is true for cabin class twins such as a P-Baron, C414/421, Navajo, or King Air.

The flight does not need to be extensive or need to involve a bunch of airwork. It just needs to be enough to demonstrate the dramatic difference in performance. This training cannot be done simply using performance charts accompanied by admonishments. The pilot needs to achieve a lasting impression from a real experience.

Further, for someone not accustomed to having a cabin full of people, another strange human event occurs. The pilot begins to think about all the people in back and stops thinking about the details of flying the airplane. That is why when doing training at gross weight, it is best to find a bunch of people who want to go for a plane ride. Fill up the cabin to max weight using real people, not sandbags.

Thanks, Dave!

Broken link, fixed

Last week's *FLYING LESSONS* contained a broken link, so let's try again to see the [video on safely hand-propping an airplane](#). It's a good thing, too...we had [another hand-propping gone bad](#) this week, a Luscombe that got away and struck a parked aircraft (it's the 10th record at that link).

See:

<http://aviationsafetyvideos.com/handprop.html>

www.faa.gov/data_research/accident_incident/preliminary_data/media/l_0212_N.txt

What would you do?

A reader writes:

I was recently at the soaring convention in Little Rock, Arkansas. During our stay there was a major dump of freezing rain--several inches. I had a decision to make. The airport phone was dead due to the ice storm. The FBO hangar door was frozen shut. It was all very quiet and the one line boy said that no traffic had come or gone since the ice storm three days earlier. Hmmm.

We took a ride on a golf cart to inspect the taxiways and runways. There was at least two inches of clear ice. It was solid, not melting, and totally undisturbed. The golf cart could skid, but traction was actually reasonable. My theory was that traction would get considerably worse after the top surface started to melt. I decided to taxi out and move around over the ice to assess traction. I could skid with the wheel brakes but

there was at least some traction. Also, the runway was wide, long and flat, and there was no wind. I taxied up and down the runway to make an assessment. I did a 180-degree turn at the end and did a run up without over-powering the wheel brakes. I told my wife I would do a slow roll-on of power to about 40 mph and see how it felt...if any kind of instability occurred I would slowly roll the power off and put it back in the hangar.

In fact, it was a totally normal take-off, albeit with a slow beginning. Absolutely no deviation from straight, and of course I had rudder control after about 40 mph. I also had the commercial airport just five miles away if I needed to land back, and it had runways that were serviceable although ice-bound at the sides.

So my point is this: I would like some guidance on how to react to such circumstances. The easy answer would be to shut the hangar door and find something interesting to do in town for three days while the ice melts, but that may be an over-reaction. The easy answer is always to delay, but that doesn't get the mission completed. Can you provide some definitive guidance on this challenging decision that every pilot may face one day?

OK, it may not be as exciting as this [wild glacier takeoff](http://dsc.discovery.com/videos/wild-ride-glacier-pilots.html) (See <http://dsc.discovery.com/videos/wild-ride-glacier-pilots.html>) but it is thought provoking. The author wrote more about his experience, which we'll save for next week to get unbiased responses now...in the **February Question of the Week #3**:

Is waiting it out always the best advice when the runway's iced over? Do you have personal experience departing from an iced-over runway? How did it turn out?

Send your answer to [FLYING LESSONS Question of the Week \(mftsurvey@cox.net\)](mailto:mftsurvey@cox.net)...then return to read more *FLYING LESSONS*. Your answers will, as always, remain anonymous.

Last week's question was:

Have you ever found yourself feeling sick while flying as pilot-in-command? What did you do?

One reader responds:

I experienced this sensation a couple of times. The first was not long after I got my private [pilot certificate]. I was on my way to Waskish, MN for opening fishing. I was giving a friend of mine his first ride north. We were a couple of hours into the flight and maybe 30 minutes from a planned fuel stop in a 1969 Cessna 172. I looked over at my passenger and said "How you doing?" It was a beautiful spring day sunshine and 0C at 4500 feet. As soon as I asked him and he replied that he was doing great, I had the sudden feeling that I was going to throw up. I started to sweat and my mouth started to water. I had to do something. I told my passenger that I had the plane trimmed out and that it would basically fly itself, but I would like him to monitor the yoke and keep it level. I opened the air vents and let that cold Minnesota air hit me in the forehead. That did the trick and within a minute I was fine.

The last time it happened to me was a number of years latter. By then I had my multi-engine IFR ticket and I was on my way back from Oklahoma. I was IFR and in the clouds with my wife beside me. I was a hot summer day in a Piper Twin Comanche. I was in and out of big puffy clouds as we headed north. I think a combination of heat and lack of food and water made me sick. Fortunately the "Twinkie" is quite stable and I was able to sit back and relax for a bit and was able to calm my stomach. I've since learned to manage food and liquid intake as I fly so that I don't get to feeling poorly on cross country flights, but it took some trial and error to figure out.

Fly safe, and have fun!

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



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