FLYING LESSONS for April 12, 2012

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. You are pilot in command, and are ultimately responsible for the decisions you make.

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:

Another well-known pilot died last week. According to the NTSB's preliminary report, the 77-year-old pilot was flying a 1940s-vintage F-8F Bearcat piston-engine, U.S. Navy fighter, when he:

> …announced over the radio that he was going to perform a Half Cuban Eight aerobatic maneuver after takeoff and then overfly the runway in the opposite direction. [A] witness stated that after liftoff the accident airplane climbed 100 to 200 feet in a shallow climb before it pitched-up into a near vertical climb. The airplane continued the climb in an inside loop before leveling out, inverted, about 500 feet above the runway [and] heading the opposite direction of the takeoff. The witness then saw the airplane's wings roll suddenly before the airplane entered a near vertical descent. The witness described the final portion of the aerobatic maneuver as a split-S maneuver, or a descending half loop, from which the airplane was unable to recover before colliding with terrain on a southeasterly heading. The witness stated that there was an explosion when the airplane collided with terrain, and that a postimpact fire ensued.

Do we say:

- Cool! What a way to go! *or*
- Why would anyone try such a thing, especially at an advanced age in an ancient airplane? What a waste!

He'd probably done it hundreds of times…but this one time it didn't work out.

People perform unsafe acts an average 600 times for every one time there's an accident, according to a construction industry study I'd encountered in a past job. Like construction equipment operators in that survey, pilots use complex machines (airplanes) to perform highly technical tasks (aviating). It stands to reason, then, that pilots do their jobs much like those in the highly technical world of modern construction ... and that we pilots, too, make mistakes hundreds of times for every one time there's a mishap.

When the odds catch up with us, we depend entirely on luck for the outcome. How many times has an accident happened only because a number of unrelated factors came together at the same time? In the construction study, for example, investigators looked at workers who jumped off their machines instead of climbing all the way down the boarding ladder. Hundreds of workers might jump without bad results. Some might lose their balance when they hit the ground, and a few of those would actually fall over. If we look at a large enough group, a couple might twist an ankle, one break a leg, and tragically, one might fall just right to hit his head on a rock and die. It's mainly a matter of luck—whether contributing factors make the incident a non-event, conspire to create a minor spill or injury, or end in death.

In aviation, scud running (for instance) might be successful, or you might nearly hit a tower, have a near-miss with another airplane in the murk, get lost, momentarily lose control in instrument conditions, or fly straight into the ground. Once you've committed to very low visibility flight, you're depending in part on luck. The same may be said of low-altitude aerobatics.

Taking unsafe actions, and escaping because of luck, reinforces bad decision-making.

Bad decision-making makes it more likely you're luck will run out next time.

Beware thinking thoughts like:

- **I've done it before.** Sneaking in “under the weather” in poor conditions, landing without enough fuel in the tanks to reach an alternate, or descending below minimums on an instrument approach but still breaking out and landing might convince you it would work next time too. A few close scrapes that luckily turn out fine can desensitize you into making this a “normal” mode of operation. When the edge of the envelope becomes normal for you, the new edge is a point where the visibility is a little lower, the headwind's a little stronger, or the obstacle's a little higher than before.
- **I can kick it up another notch.** If you can find the field in one mile visibility, why not three-quarters? How about one-half? “Ten gallons is enough of a reserve,” you reason, “but my fuel gauge shows I'll only have five left on landing -- that's still enough.” Fifty feet below MDA usually makes the difference in breaking out on the approach, but today it's still murky at that altitude. How about a hundred feet this time? Repeated “success” at being lucky can goad you into pressing your luck just a bit more next time—you cross over the line.
- **The rules are for someone else.** “You've told me and told me to keep at least three miles' visibility, ten gallons in my tanks, or not a foot below MDA. But I showed you--and I can do it with less. What about all these other rules? They're for novices. I'm better than that.” Ignore one rule and you're tempted to ignore them all. Just remember—the rules are generally made after a crash, not before. Reading regulations is like reading an history of aviation accidents…most rules exist because violating them killed somebody.

Admit it—you've done things in airplanes you're not proud of. I know I have. The trick to long-term survival is to recognize your mistakes and commit to correcting them next time out. If you don't correct your mistakes, you should start each flight by asking yourself: “Do I feel lucky?”

Questions? Comments? Let us know, at mastery.flight.training@cox.net

Debrief: Readers write about recent *FLYING LESSONS:*

Last week’s *LESSONS* were about the benefits—and challenges—of flying multiengine airplanes. Reader Bob Stambovsky provides this summary:

> There are four reasons to need a twin:
>
> - Extended Range
> - Hauling capacity
> - Flying over water
> - Flying mostly at night

Thanks, Mike. Reader Joe Frisch adds:

> The section on twin safety was interesting, but it didn’t discuss what I consider to be one of the most critical piece of information which is the type of flying being done.

> I think that for most GA pilots a twin is considerably more dangerous than a single during takeoff: there is twice the chance of a failure, most pilots will have difficulty handling a sudden engine failure just after liftoff, and if you cut the power a twin typically lands (crashes) faster than a single.
>
> After takeoff though, the situation changes. An engine failure in normal climb or cruise flight isn't particularly difficult to deal with. You are typically well above blue-line and there is lots of time to get the plane under control.
>
> If you do a lot of flying over hostile terrain / night / IMC, the added safety of a twin in cruise can easily outweigh the added risk for the first 30 seconds of flight. If most of the flying is day VFR over relatively flat terrain, then the result may be very different.

Thanks, Joe. I think we're pretty much in agreement, evidenced by the thesis of my commentary last week:

> I will never try to talk someone out of purchasing a twin-engine airplane on the basis of number of engines alone. Most twins perform better and carry a greater load than most singles.
>
> Although modern single-engine airplanes are frequently equipped with redundant systems, most twins have more redundancy than singles. Mainly because of their size and weight-carrying capability, many twins have more equipment than singles, including things like radar and ice protection devices. In capable hands twin-engine aircraft are obviously safer, because they provide at least the potential option of continued flight in many situations in the event one engine fails.
>
> The issue, then, is not telling you a twin would or would not be a good thing for you. The question instead is:
>
> 1. Will you commit to the initial and recurrent training necessary to take advantage of the increased safety, and
> 2. Are you willing to invest what it takes to safely operate the twin?

If the answer to both questions is "yes," then we agree, there are many advantages to flying with a second engine.

Frequent Debriefer Woodie Diamond comments:

> Every time I read a copy of *FLYING LESSONS*, I take its content personally, applying each item to my own flying. This week's issue addressing twin ownership was particularly poignant. I would suggest that there exists an option for twin ownership that may pose somewhat less possible dangers than what you described: the Beechcraft Travel Air. Fully admitting that my only other twin experience is limited to the Cessna 310 and the Piper Seminole, I will tell you that engine out emergencies in the Travel Air are nothing like either one of those airplanes, particularly the Cessna 310. From my experiences, purposely shutting down an engine in the Travel Air, *which is the only time I hope anyone ever experiences an engine out situation,* is relatively a non-event. The airplane will yaw, albeit rather slowly, into the dead engine, but there is little if any rolling tendencies. The truth is that the aircraft is incredibly forgiving, simply asking the pilot *"what are you going to do now?"* Literally, the aircraft can be set for single-engine trimmed flight without pilot control input except for moving the rudder and aileron trim controls *(I've done this as a test, but obviously would not be a technique that anyone should rely upon).*

Thanks, Woodie. I've never had the opportunity to fly the Travel Air, so I'm not familiar with its engine-out tendencies. A relatively low-powered airplane (i.e., lower asymmetric thrust when on one engine) with a large stabilizer and rudder, it probably is much more benign than, say, the Barons with which I'm familiar. Before we draw any conclusions about a rapid, unexpected engine failure at the most critical time (on takeoff), however, consider the circumstances under which you have practiced engine failures in your Travel Air. The U.S. Practical Test Standards recommend intentional engine outs only be initiated only above 3000 feet AGL. Most experienced multiengine instructors (MEIs) follow this guidance, or do engine-out work even higher if conditions permit.

In a naturally aspirated airplane, engine power drops at the rate of about 10% per every 3000 feet increase in altitude (approximately 30 inches MP at sea level, lapse rate 1" per 1000 feet in the lower atmosphere, so three inches or 10% drop per 3000 feet). Consequently there is significantly less power on the "good" engine during typical engine-out practice; this means the rate of departure from controlled flight on all three axes will be lower than would be experienced

in an actual engine failure close to sea level. You don't have to work nearly as hard in practice as the ***prompt***, ***correct*** and ***aggressive*** response required if an engine quits right after takeoff at a lower altitude.

Controllable? Absolutely…if you're on top of your game. It may be that you practice unexpected engine failures often enough that you retain the necessary reflexes to speed up your reactions for "the real thing." I'd feel better, however, if you'd try to avail yourself of simulation if it's available.

David Heberling says something many more experienced pilots frequently say:

> Sometimes I am amazed that I made it through my early aviation career without killing myself. I started taking flying lessons in 1972 (at 13 years old). I became a CFI in 1976 and a MEI in 1977. I also became a FAR 135 Captain in 1977. Starting as young as I did, I had no fear of anything in aviation. It was not until teaching others that I discovered there was something to fear. The only simulator I ever saw (and used) before my airline career began was a Link Trainer. It was a real antique, but it worked! Obviously, all of my twin-engine training was in the airplane. All of my twin students learned in the airplane. The exact advice I got from my instructors (I had many, not just one. I flew with whoever was available) is lost to me now, but the importance of the Blue Line (Best single engine climb speed, a misnomer if there ever was one) must have been hammered into me. At that time, we had to do a FAR 135 check ride every six months as our authorizations were only good for that long. We also were flying a lot at that time, so currency was not an issue.
>
> I do remember having my twin students fly a single engine ILS to an 8000-foot runway in Rochester, NY visually. At about 50 feet I would tell them to go around. This was done in a [Piper] Seneca I which was an underpowered pig. I hammered them with a mantra: "You cannot go anywhere until you get to blue line." We ended up using the entire 8000 feet before we were able to initiate a meager climb on one engine. Some may consider this to be a highly risky scenario to do in the real airplane. I had been highly sensitized to the loss of an engine on final with a go-around at the end due to a fatal accident in a Twin Comanche by a pilot we all knew. I wanted my students to be exposed to real world risks and teach them how to deal with them. This is the best I could do.
>
> Thank god for the advance of simulator technology. Now, these same types of scenarios can be done safely. Thanks for all the good work you do, these are great discussions.

Thank you, David. Reader Richard Benson asks:

> Thanks for all the wonderful illuminating weekly ideas!!!!!!! I was looking for '***archives***' on your website and did not see them. I'd like to review some of the weekly-ies beyond the year that I've been reading them. Can I access the older ones?

Thanks, Richard. I don't have a *FLYING LESSONS Weekly* archive on the website beyond the two most recent reports, linked in the left column at www.mastery-flight-training.com. I do provide an abbreviated version of *FLYING LESSONS* each week on the FAA's www.faasafety.gov site. This indeed does maintain an archive of *FLYING LESSONS* reports, at www.faasafety.gov/gslac/ALC/lib_categoryview.aspx?categoryId=21.

Readers, would you buy a compilation of past *FLYING LESSONS* items, arranged in chapters by topic? Not that I have much time now to put it together, but if enough of you want it I'll begin working on it as time permits. Maybe a summer project….

Let me know, about this and any other comments you may have…at mftsurvey@cox.net.

A Poorly Distributed NOTAM…

…can ruin your day. Reader Mike Massell writes:

> You may have seen this but as a regular user of Fltplan.com I receive their newsletter and this was a recent article that some of your readers might like to read.

Thanks, Mike. It's a great illustration of the challenges of getting the information your really need from Notices to Aviators (NOTAMs).

As many *FLYING LESSONS* readers may know, back in the Bad Old Days I wiled away the hours sitting in the command chair of an U.S. Air Force nuclear missile launch facility. This is

only relevant here because we were continually trained and meticulously evaluated on ever-changing rules and regulations for when (and when not) to execute our primary duty. The rules were sometimes tricky; we, our instructors and evaluators were constantly debating whether the rules should be much simpler and clearer, to significantly reduce the possibility of making decisions based on incomplete or mis-understanding of the conditions of the test. Should we all be trivia masters, making split-second, world-changing decisions under stress? Or should Higher Headquarters "spoon-feed the crews" by making things as easy and clear-cut as possible?

In a way NOTAMs remind me of those old ways. We have to wade through reams of paper (or the electromagnetic equivalent) to try to pick out exactly the information we need. Often the true data are hidden and even seemingly contradicted by slightly clearer and more-easily-read information. Just like the Bad Old Days, we have to dig, and dig some more, to avoid situations like that in the Fltplan.com story. Take a look.

Readers, if you're in a position to have some impact on the format and readability of Notices to Aviators, please take a few minutes to see if we shouldn't be spoon-feeding the flight crews by clarifying and simplifying the NOTAM process. Thank you.

See http://flttrack.fltplan.com/fltbrief/April2012/fltbriefvol1.htm#4

Predicting Convective Weather

The March/April 2012 issue of *NBAA Insider* published by the National Business Aircraft Association, contains a new weather tool that can be very useful in forecasting convective weather. Check it out.

See www.mdl.nws.noaa.gov/~glmp/convection.php

IFR Emergency Video

FLYING LESSONS reader Mark Robidoux's PilotWorkshops.com announces a free IFR Emergency webinar that has already been seen by over 10,000 general aviation pilots. This fast-paced, 30-minute program deals with a hair-raising emergency in IMC. Robidoux and expert instructor Bob Nardiello walk viewers through this challenging scenario, which presents the conditions of the emergency and provides the viewer with a choice of options. After the viewer makes their choice, Bob walks through the particulars of how this emergency should be handled.

The IFR Emergency program is based on PilotWorkshops.com's IFR Mastery Series, a scenario-based training program for IFR pilots.

See http://pilotworkshop.com/webinar/ifremergency

Questions? Comments? Let us hear from you…at mftsurvey@cox.net.

Share safer skies. Forward *FLYING LESSONS* to a friend.

Flying has risks. Choose wisely.

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