



## **FLYING LESSONS** for January 3, 2013

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.

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### ***This week's lessons:***

In the December 20<sup>th</sup> *FLYING LESSONS* I began a review of [the increasing rate of fatal accidents](#) in personal and recreational aircraft use over the past decade. The goal is to toward defining the apparent causes of this increase, opening channels of reader discussion about ways to make personal and recreational flying improve at least to the rates of business-use flying of similar type airplanes flown by non-professional pilots.

See [www.mastery-flight-training.com/20121220flying\\_lessons.pdf](http://www.mastery-flight-training.com/20121220flying_lessons.pdf)

**The big increase in fatal accidents** in personal/recreational flying seems to be lost in the overall flat mishap and fatal crash rate of general aviation as a whole, driven by the disproportionate number of (estimated) flying hours in corporate aviation, most in turbine equipment flown by full-time professional pilots.

**I received a significant amount** of well-informed, well-reasoned reader mail in response. Several readers disagree with the NTSB statistics I cited (including the same conclusions NTSB has published). Others agree that the problem isn't receiving the attention it deserves. Because several of the responses are fairly lengthy (I'm *not* complaining!), this week I'll launch right into the Debrief section and cover as many as reasonably fit in a single issue of *FLYING LESSONS*. Be assured I'll eventually and fully quote all the responses I received.

Questions? Comments? Let us know, at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net)

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### **Debrief:** Readers write about recent *FLYING LESSONS*:

One reader writes:

I've suffered from the same criticism. "You're taking all the fun out of flying." Kinda like cancer taking all the fun out of smoking.

The reader, a well-known safety researcher who wishes to remain anonymous, cautions that "the analogy is flawed," but the point is taken—the temptation is strong for pilots (and those who teach

and report on aviation) to gravitate to the “low and flat” GA fatal crash record, and find ways to rationalize away the 25% increase in the rate of fatal personal/recreational crashes over the past decade. Certainly, as I discussed in the December 20 *LESSONS*, the media has heavily reported the overall flat rate, and all but ignored the NTSB data when broken down by “class” of general aviation.

Aviation-savvy readers who know statistical investigation better than I replied to the report. David Kenny, frequent Debriefer and chief statistician for AOPA’s Air Safety Institute (ASI), writes:

Good morning, Tom. I was interested in your piece on accident rates on personal flights, not least because the NTSB has been publicizing the same result. Unfortunately, I have a suspicion that there’s less to this than meets the eye.

You’ll recall that the estimate of the personal accident rate comes from two components: the number of accidents that the NTSB classifies as having occurred on “personal” flights, and the estimated number of personal flight hours from the FAA activity survey. Neither attribution is free of error and both are potentially subject to bias. As a statistician, when I see an overall rate that doesn’t budge decomposed into one component that’s going up and others that are going down just enough to compensate, I tend to suspect that we’re seeing shifts in the way those classifications are assigned rather than real-world trends that just happen to offset one another.

I have some inquiries in to see whether the way the FAA estimates flight time may have changed systematically during that time. I’ve already seen some evidence that the NTSB’s classification of accident flights may have been changing. I tend to think of any authorized flight by a student pilot as an instructional flight (an unauthorized flight to, say, visit his girl friend would have to be considered personal) – but in 1991, the NTSB classified 20% of the accidents on student solos as having occurred on personal flights. In 2010, that figure was 39%.

The question of whether personal flights are really becoming more dangerous or whether we’re simply seeing a shift in how they decide which accidents to toss into which buckets is one that deserves closer attention than I’ve been able to give it this morning. In the meantime, though, I’m not persuaded that the NTSB’s claim of an increasing personal accident rate deserves to be taken at face value. I agree, though, that the accident rate on personal flights is and remains higher than those in most other types of general aviation.

Keep up the good work!

Thanks, David. Changing variables may indeed make the overall picture fuzzy. Please read on...

Reader Nate Deuhr adds:

I find it interesting that in order to get fatal accident rate numbers to be whole numbers, the number of flight hours has to be 100,000. This is a common tactic in statistical manipulation to make things that are very small seem more significant. It’s done to make them seem more meaningful.

Judging by the [NTSB’s] graphs, the fatal accident rate for personal flying is roughly 2.5 accidents in 100,000 flight hours, if I’m reading it correctly? (It’s also a notably difficult graph to read all the way across to the right, another typical trick, when attempting to show a higher number over time.)

So, how about changing the flight hours to something a typical personal aviator would fly? Say, for mathematical simplicity, 1000 hours? (How many “personal flying” pilots exceed 1000 hours in a lifetime? I honestly don’t know. Does “personal flying” include IFR? IFR in bad weather and marginal equipment? VFR? Etc. It doesn’t say.)

Fixing the location of the decimal point to a more commonly seen number in Private Pilot logbooks, this would lower the fatal accident rate to 0.025 fatal accidents per 1000 hours flown. That’s a very small number.

My logbook in 21 years of flying recreationally has half of that number of hours. Most pilots accrue maybe 100 hours in a good year, flying recreationally. Most rules of thumb for aircraft ownership also fall at 100 hours. In 100 hours, there are 0.0025 fatal accidents, if I’ve done my math correctly.

I’m not sure that saying a 20% increase in such small numbers is even outside of the noise level when expressed that way. Multiply to 100,000 hours, it’s still less than 3. The scope of the graphs is badly chosen if we are attempting to relate the numbers to individual’s typical logbooks. 1000 hours seems reasonable.

You have a good point, Nate. The numbers are indeed very small. Regardless, they appear to have been increasing, especially in personal/recreational flying. Once the true effect of aircraft

triennial re-registration is fully realized, which many believe will show a substantially smaller number of actual airworthy airplanes in the fleet (and therefore many fewer thousands, or hundreds of thousands, of flying hours estimated annually), the rate per hours flown will likely increase even more.

Instead of focusing on the specific numbers and getting bogged down in statistical theory, let's agree that:

- In a perfect world no one should die or, as a passenger or bystander on the ground, be killed as a result of an airplane crash.
- Personal and recreational-use airplanes are involved in at least as many and probably more deadly crashes than they were a decade ago.
- Most fatal crashes are the result of the same situations faced by pilots again and again.
- Therefore, there should be things we can do to benefit from the tragic experience of others, to reverse the increase in fatal crashes and get closer to the perfect world.

Reader John Townsley adds:

I don't know where Bruce Landsberg finds the data to support his hypothesis that “ **all it would take to dramatically reduce the rate of serious and fatal crashes is for pilots to fly to the completion standards** of the (U.S.) Private Pilot and, if instrument rated, Instrument Pilot Practical Test Standards.”. From my read of accident reports and mishap reports and from looking at the Nall Report as well as discussing the problem with the FAASteams coordinators in this part of the US, relatively few serious accidents have a root cause of stick 'n rudder skills. In nearly every case the pilot in command made serious errors in judgment, or accepted high levels of risk. This leads me to believe the disparity in the recreational/personal flying accident rate results from errors of judgment/ADM and high risk tolerance, not the inability to fly the airplane.

Well, I don't want to speak for Bruce (beyond quoting him in the earlier report), but I tend to agree—not just because of the stick-and-rudder skills evaluated during Practical Tests, but because aeronautical decision-making (ADM) and risk management are indeed evaluated in the Practical Test Standards (PTS) as well.

Let's look at one example that's on (Northern Hemisphere) minds this time of year, airframe icing. In the Private Pilot PTS, Area I: Preflight Preparation, Task C: Weather Information, the examiner evaluates the Private Pilot applicant on “icing and freezing level information,” and ensure the pilot “makes a competent go/no-go decision based on available weather information.” Task A of the same Area requires the examiner to evaluate the applicant's ability to “explain...operating limitations, placards...and [the] POH –Pilot's Operating Handbook]/AFM [Approved Flight Manual].” A very common airframe Limitation among GA airplanes is that “flight in icing conditions is prohibited.” Throughout the PTS, it's the examiner's responsibility to evaluate the applicant's risk evaluation, judgment and Single-Pilot Resource Management.

*If* the Practical Test is properly administered, and *if* the pilot performs to the Practical Test Standards on *every* flight throughout his or her career, then the pilot will:

- Know when icing conditions are forecast or likely to exist;
- Know the limitations against flight in icing conditions that apply to the airplane flown; and therefore
- Observe the limitation against flight in icing conditions.

Whether Practical Tests for pilot certificates and ratings are actually administered in such a way to achieve this outcome is grist for a future discussion.

The pilot will *not* try to climb through an icing layer to clear skies above because he/she has a powerful engine, or descend through a layer of below-freezing cloud attempting to “dive through it” to warmer air below, or accept the possibility of ice by cruising in cold clouds or precipitation because the sky is clear from the base of the cloud ceiling to the Minimum Enroute Altitude. He or she will *avoid* the ice-free air completely, either by selecting an altitude that does not require any ice penetration; diverting around the potential icing conditions, even if that means not beginning an approach into reported or suspected icing clouds at the end of a trip but instead immediately diverting to an alternate; or delaying or canceling the flight if none of those other

options exists. Having a turbocharged engine for rapid climb, or knowing the icing layer is only a few hundred feet thick, or being a master of the [Skew-T, Log P diagram](#) does not change the prohibition against flight in icing conditions. That's what you'd be expected to do on a Practical Test (oral or flight) given the conditions; fly to the Practical Test Standards and you successfully avoid the threat.

See [www.met.tamu.edu/class/atmo251/Skew-T.pdf](http://www.met.tamu.edu/class/atmo251/Skew-T.pdf)

Please note that I am not trying to refute on John's remarks, because I think he and I would agree that the PTS are not taught and evaluated that way. It's a matter of defining what I mean (and I believe Bruce does as well). Yet, using our example, pilots still fly non-ice-approved airplanes into icing conditions. Practical Tests tend to focus on the physical flying skills that are important but not those that, as John correctly observes, are the locus of most fatal general aviation crashes—the pilot's risk management and decision-making. Reader Townsley continues:

Your desire to “close the gap” between business flying and personal flying ignores the significant differences that exist in the support systems, procedures, initial training, recurrent training, and equipment.

At least as a beginning, my desire is simply to close the gap between personal/recreational flying and what the NTSB defines as “business” flying—flight that serves but is incident to the conduct of business, flown by a single-pilot Pilot-in-Command who is not employed as a full-time pilot. The NTSB's distinction between a Personal/Recreational flight and a Business flight is the difference between a Piper Saratoga flown on a family vacation and that same Piper Saratoga flown by the same pilot when he/she is flying across the state to a business meeting. This is contrasted with Corporate flying, which has a significantly improved record over even Business flying, in large part likely because of the support systems, crew requirements, training and equipment Corporate flying enjoys. According to the NTSB, the Business flight (meeting this definition) has a fatal accident rate three times lower than the very similar Personal/Recreational flight. This is the gap that I believe can be most readily closed.

Here reader Townsley superbly observes:

Arguments to the contrary do not appear to me to shed light, rather they merely obfuscate and divert us from investigating the three fundamental issues:

1. How to teach (and maintain) judgment and decision making skills;
2. how to instill a low level risk preference in pilots; and
3. how to increase decision support systems available to recreational and personal flyers to business aviation standards – assuming that the business aviation accident rate is the metric against which recreational and personal flying will be measured.

The [FAASTeam](#) model of recurrent training, which relies upon carrots and not sticks, approximates a scaled down recurrent training model of business flying – minus the annual or semi-annual check rides mandated for Part 135 pilots. While the accident rate for participants in FAASTeam seminars is reported by the FAA to be quite low, it still exceeds the business metric... It also, as a voluntary program, is (in my opinion) likely to attract a more risk-averse slice of the GA population. So, how do you propose to **establish a social norm for risk tolerance that is suitably low (and what might it be?) that would encompass and engage all recreational and personal flying aviators???**

See [www.faasafety.gov](http://www.faasafety.gov)

*That is the grail—how do we convince pilots to better evaluate risk at least enough they stop repeating the same deadly mistakes we read about week after week (which is, after all, the basis of *FLYING LESSONS*). Read on:*

We already have in the FARs a very complex and comprehensive set of regulations that are very difficult to enforce (probably impossible), and that in fact have the greatest utility in bringing sanctions post mishap when an infraction is pretty obvious, or when an individual is observed in a flagrant act that demands enforcement action. **Can we legislate judgment?** If so, what amount of overhead (in terms of regulatory presence and user costs) is acceptable to you and to AOPA? Clearly, increased costs will likely adversely affect recreational and personal flying. Of course, that in itself may “improve” accident statistics by reducing the participating population.

I am an active participant in FAASTeam seminars, I encourage others to participate, I facilitate and have

taught many seminars – yet I recognize from observing many hundreds of pilots that individual attitudes toward risk vary tremendously, perhaps even more than skill. **There is also a great variation in how pilots judge themselves “fit to fly”.** Just look at the NTSB reports to get a measure of the number of pilots who have experienced a mishap because of illness, possible (but seldom affirmed by post accident investigation) unanticipated effects of over-the-counter drugs, illegal drugs (booze, MJ, etc.), or Rx drugs, and the emerging issues of cognitive deficiencies from disease. In the final analysis, these are not skill issues. They are expressions of risk tolerance and what we call ‘ADM’. In the absence of a Dispatcher who dispassionately evaluates the risk of the flight, recreational flyers and pilots of personal flights are free to accept whatever risk that is acceptable to them at that moment. As with rock climbing, motor cycling, white water kayaking, and participating in marathons in Death Valley, personal flying has a higher degree of risk than business flying by the very nature of the activity. Your rhetoric, and the language used by Landsberg are unhelpful in addressing the fundamentally different nature of personal and recreational flying.

Thanks for a superb Debrief, John. In light of what I’ve written here about business vs. personal/recreational flying and the full scope of the Practical Test Standards, I hope we can continue this discussion. The fact that you volunteer so much of your time and expertise as a FAA Team representative tells me you have not given up the fight to *do something* about pilot judgment and attitudes.

Summing it all up, remember that as reader Dr. Bill Rhodes wrote,

*If safe utility is the goal, we have examples of pilots who accomplish that routinely; sadly their expertise is for the most part left uncelebrated.*

And as [John and Martha King](#) have derived noncorporate general aviation’s “safety” record is about the same per mile traveled as motorcycles in the United States. That means the vast majority of pilots *do* successfully and safely complete personal and recreational general aviation flights every day. Flying *can* be done without death, injury or damage. It’s up to each of us to ensure that we evaluate and manage risk, exercise caution in the terribly unforgiving environment of flight, and use good stick-and-rudder skills, for *today’s* flight. Fly like you’re taking a checkride...because in a very real sense you are flying a Practical Test on every flight.

See [www.kingschools.com](http://www.kingschools.com)

I’ll have a few more reader responses, and undoubtedly some Debriefing related to this week’s discussion, in the next edition of *FLYING LESSONS Weekly*.

Something to add? Let us know, at [Mastery.flight.training@cox.net](mailto:Mastery.flight.training@cox.net)

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## Question of the Month

Readers are still chiming in on “What makes a good instructor?”:

*A good instructor* teaches pilots how to handle the unknown. One of a beginning pilot’s biggest problems is anxiety. The general public has so many misconceptions. Many pilots begin flight training nervous and with various amounts of fear. Most find comfort in flying after a few lessons, but some student pilots are so nervous they never finish learning how to fly. **A good instructor must sense pilots anxiety and adjust the training** to give the pilot the opportunity experience as many unknowns as possible.

*As a 33 year CFI*, I have always defined a good teacher as **"one who can successfully create an environment that is conducive to the learning of the task at hand."** This takes **creativity and flexibility** on the part of the instructor, and is dynamic in that the needs of each student and what it is they are learning is a unique event every time, and no two students are the same. This in my opinion is what makes teaching both challenging and rewarding at the same time.

*I think the best instructors* teach rules, regulations, flying technique, **blended with real world experience** and practical real-world flying. Then, I think, it is important to fly with multiple instructors to get a well-rounded education. In general, I believe there is a difference between how we fly and how we train.

Thanks, readers!

What's *your* experience? Let us know, at [mftsurvey@cox.net](mailto:mftsurvey@cox.net).

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

***Personal Aviation: Freedom. Choices. Responsibility.***

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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