



FLYING LESSONS for January 10, 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:

The triple-fatality crash of a Beechcraft Bonanza into an occupied Floridian house this week was widely reported in the aviation media, including distribution of the [Air Traffic Control audio](#). The scenario begins about 5:50 into the recording.

In many ways the exchange is the model of professional behavior—both the pilot and controller voices are slightly elevated when the pilot first reports a "vibration in the propeller," but the controller immediately points out the direction and distance to the nearest airport to help. The pilot, however, says oil pressure is down and "we're going to have to drop down here pretty quick." The controller then clears the flight to descend to 2000 feet.

There is further conversation that seems distracting to the pilot when the controller asks the obligatory "how many souls on board, and fuel remaining" question [do controllers *really* need to know the answers to these questions, and if so, do they need to know right away *right away?*]. The controller additionally asks to pilot to confirm there is a "vibration in the engine," an interruption which certainly could not have helped under the circumstances and has no bearing on the controller's ability to respond to the crisis. The pilot shortly brushes it off, and the conversation continues while the pilot aims for the airport.

The pilot seems to be well in command as there is a discussion about the IFR conditions, and the controller does not seem to fully grasp that the airplane is not equipped to fly a GPS approach. As the conversation continues, the pilot wisely states he simply wants to descend toward the nearest airport and "hopefully" break out for a visual landing. The controller acquits himself by offering a radar surveillance approach to the airport, and the pilot sounds very relieved in response.

The controller then directs the airplane to continue descent and gives a frequency change. The pilot accepts the clearance. The same controller is working the new frequency [could they have avoided the frequency change?], and there is quite a bit of distracting traffic on the frequency [could they have given the emergency airplane a discrete frequency?].

The approach continues. The pilot starts missing radio calls. The controller reports the pilot is on a six-mile base leg for the runway—instead of vectoring the plane for the final approach course, which is Standard Operating Procedure for controllers, could he have guided the pilot directly to the airport? Should the pilot have made it clearer that's what he needed, instead vectors to a long final approach?

The controller very professionally keeps the pilot advised of his alignment with the final approach course, although other airplanes on frequency may make it hard for the pilot to hear. The controller also clears the pilot to descend to the minimum descent altitude, as if it's not clear the single-engine airplane can't hold altitude. He reports to the pilot that he [the controller] has very helpfully coordinated his landing clearance at the target airport.

Then radio contact is lost. The controller is still working other airplanes, and begins calling the now-missing aircraft. He does not know the airplane has impacted a house and, although the home's occupant escapes unhurt, the pilot and his two passengers are now dead.

See <http://archive-server.liveatc.net/kdab/KDAB-App-Dep-Jan-04-2013-1900Z.mp3>

I can only imagine the feelings the controller likely has in the wake of this event. And I cannot fully understand the emotions of those who lost family or friends in the crash, or the terror of the woman whose quiet afternoon ended in sudden destruction of her home. As always, I apologize if my attempt to draw positive lessons from horrible events falls short of that mark, and my words inadvertently and negatively impact a survivor.

I commend the controller for immediately pointing the pilot toward the closest airport, staying on top of the situation, and staying with the pilot as long as possible to get him on the runway. He asked all the right questions at the right times (at least per my understanding of controller training) and does what (I believe) he has been trained—guide the pilot onto a normal instrument landing approach.

I applaud the pilot for calmly communicating his problem and intent, for accurately following the controller's guidance, and for dealing with the incredible distractions of engine failure, busy radio traffic, a frequency change during an engine-out glide, and the likely reactions of his passengers as the engine vibrates, oil pressure drops, and the pilot begins an emergency glide into a low cloud deck toward an unseen airport.

This tragic event, however, makes me think that perhaps pilots need to work more closely with Air Traffic Controllers they learn each other's procedures and, more importantly, their needs in an emergency. Pilots need to know that controllers will want to direct them through gradual altitude step-downs into a long straight-in approach. They need to know when an emergency is an emergency, and state so without question if that's what it takes to trigger the needed ATC response. Controllers should know that pilots need to maintain altitude if possible until directly over an airport when an engine fails, so be in a position to glide down to a landing if needed, and have altitude to exercise other options if the pilot cannot make it to the airport. And they need to know the tremendous workload a single-pilot operator faces in an abnormality or emergency, and that "mandatory" status questions, routine frequency changes, and normal instrument approach procedures introduce distractions the pilot does not need in a time of crisis.

Had the pilot had asserted his need to hold altitude and go directly to the airport, not take vectors for a long, straight-in approach; and had the controller understood the limitations of a single-engine airplane with a critical loss of power, one or the other party could have delivered the airplane to a point directly over the airport before the engine finally failed and the airplane plunged into a home. From there, it's up to the pilot's stick-and-rudder skills to make it down safely. But he would have had the best possible chance.

I know many controllers and regulators in many countries read *FLYING LESSONS*. I don't pretend to understand all that controllers know. That's the point—we need to talk. I call for discussions between pilots, controllers, and those who write the rules they follow, to make a concerted effort to understand Standard Operating Procedures and expectations from one another in times of crisis. And we need to amend those SOPs and expectations if needed.

Perhaps my *FLYING LESSONS* readers agree for the need for a pilot/controller review of emergency procedures on both sides of the microphone, and are in a position to drive that agenda and make this type of tragedy less likely to recur.

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

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Debrief: Readers write about recent *FLYING LESSONS*:

Readers are still writing about the NTSB's reports that the rate of fatal crashes is increasing among general aviation airplanes. Reader Bill Rhodes addresses the apparent disagreement over the NTSB fatal accident statistics evident from recent *FLYING LESSONS* Debrief items. Bill writes:

I recognize a frustrating dialogue that's all too familiar to me. It's tough to stay well-focused when the nomenclature and statistics are understood so differently by so many parties.... I've seen varying reactions to the claim that personally-flown GA has a terrible mishap record. The increase or decrease is interesting, and certainly bears investigation, but the baseline is itself the problem. Some react by questioning the numbers or the method, others ignore them, some act to improve them, or at least to make themselves safer. The issue seems intractable, in part, because many participants talk past one another.

The worldview in much of GA culture seems almost dismissive of the facts; that may be because the facts are disturbing, and we're creatures that find cognitive dissonance, well, dissonant. So, some attack the methodology, others find a way to tell themselves that they're not like the rest, or bluster in a way that helps the culture cheer for itself. None of this changes the facts, of course, but it does make some feel better. In this way, the smoking analogy [quoted in last week's *LESSONS*] works.

But I think a better analogy is to sports. A broken neck takes all the fun out of playing football. It doesn't do your family any good either. Sports are lots of fun, and we might encourage our kids to engage. But we would not tolerate their being on a team that's coached irresponsibly. If we saw numbers that showed our kids' team having, say, twice the average number of concussions or broken necks as the average, we'd investigate. And if the average in our chosen sport was way above the average of all sports, we'd focus our attention more broadly on our sport as a whole. But there's nothing about sport that *necessitates* broken necks. It's how the kids are coached, the rules, and the culture of high school sports that determine the statistics. And, I dare say, if high school football killed 10 persons a week (fast web search showed the 2009 number was 3 fatalities in HS football in the *year*), the coaches themselves would likely take responsibility and fix things for the better.

A well-coached high school team cares about victory, of course. But it does not pursue victory at any cost. Good coaches know that the sport itself is worthwhile—and that losing can be an invaluable developmental experience. Losing does not take the fun out, but dying sure does. Keeping victory in its proper place is a key to serving both the sport and the players. Likewise, keeping utility in its proper place is key to flying well. It's valuable, and we're both committed to it, but it is not more valuable than staying healthy. Some of my best flying experiences have involved waiting for WX in new places. If all I cared about was getting there, I'd buy an airline ticket.

The fact that you're getting the responses you are suggests to me that you're probably in the right place.

Thanks very much, Bill. Your sports analogy is worthwhile, and your grasp of priorities is enviable. Reader Tom Allen responded to the smoking comment with another analogy:

It may be a little like this. I see people ride motorcycles with helmets and full leather. Others have no helmet, swim suit and flip-flops.

We as general aviation pilots need to "wear our helmets" in the form of making better decisions, staying current with aircraft control, and flying well within the limits of the airplane's capabilities.

As bikers have over the years, we need to move the culture of pilots further toward the attitudes of what we call “safety.” There will always be holdouts, but we can get far better. Thanks, Tom.

Bryan Neville, Outreach Program Manager for the FAA Safety Team, writes about last week’s comments about the FAA WINGS program:

Correction: The WINGS Program does not require 3 hours of flying; never has. We do require the satisfactory completion of 3 flying tasks, taken from the PTS [Practical Test Standards] and which address the primary accident causal factors we see so often noted in accident reports. This is in addition to the 3 knowledge tasks required for completion of a phase of WINGS. A proficient pilot will likely complete the flying tasks in less than 3 hours, while a rusty pilot may take more than 3 hours. (I know this because I went out and flew those 3 flying tasks myself!) A comment: While you are correct that resources have been limited, we have a wealth of information available on FAASafety.gov, with the online courses being the most popular. We are also in the midst of training our [Program Managers] on the use of a Webinar system for presenting safety seminars, and expect that tool to be available soon.

Let me take this opportunity to thank you for your insightful comments on aviation safety. I believe that if a pilot reads your weekly *FLYING LESSONS*, he or she will keep their head in the game and will maintain risk awareness, a primary tool for mitigating an accident! With the introduction of RSS feeds from our site, it is even easier for our users to read your *FLYING LESSONS* each week! Thanks again for all you do.

Thank you very much, Bryan. I’m proud to have *FLYING LESSONS* appear weekly on www.faa.gov, and thank you for everything you do to promote flying safety.

Frequent Debriefeer David Heberling observes:

I understand the current push to increase judgment and ADM skills in aviation. However, I would not call stall/spin accidents in the pattern a judgment problem.

Excellent point, David. This brings us full-circle to the beginning of this discussion in the [December 27 FLYING LESSONS](#), when I wrote:

I feel there should be more guidance for flight instructors on those items that should be presented in existing Required Flight Reviews.... I suggest that, just as the Instrument Proficiency Check (IPC) specifies those Tasks from the Practical Test Standards (PTS) that must be presented and flown to at least Instrument Rating performance standards for the instructor to endorse the IPC, so should the Flight Review contain a list of specific items from the Sport Pilot or Private Pilot PTS (as applicable) to which the pilot must be trained to attain PTS performance standards in order to earn a Flight Review endorsement.... The enhanced Flight Review...should cover items we already acknowledge as being the minimum performance standards for rated pilots.

Since the mid-1980s I’ve seen, I believe, three eras of Federal “back to basics” initiatives to address the fact that, although the overall rate of mishaps is down sharply from the supposed golden age of general aviation, the causes of the crashes that do occur have changed little. Yes, pilot judgment is a factor in 70 to 80% of all general aviation crashes. But it is not the *only* factor. Making a bad decision in and of itself doesn’t usually bring an airplane down. Instead, bad judgment usually results in putting the pilot in a position that he or she makes a critical stick-and-rudder mistake...like a stall that occurs when a pilot decides to attempt a takeoff in an area of microbursts, or a loss of control when a pilot chooses to attempt a low-level flight in marginal weather and becomes disoriented.

I could incite weeks of fiery *FLYING LESSONS* email by taking a stand on whether pitch controls speed and power controls rate of descent when on final approach, or that pitch controls rate of descent and power controls airspeed on final approach. The answer isn’t one or the other—it’s the interaction of both. Change power and you must change pitch. Change pitch and you must change power.

Similarly, the answer to improving flying safety isn’t to focus solely on better decision-making or a back-to-basics concentration on aircraft control. We need *both* to make a positive difference. Trouble is, most pilots seem to feel the minimum training requirement is enough, and are unwilling to put in the time needed to retain a high level of basic proficiency and study and practice to improve decision-making too...not to mention the time necessary to develop and retain proficiency with modern avionics, which in many cases consumes all the time and money a

pilot budgets to recurrent training.

See www.mastery-flight-training.com/20121227flying_lessons.pdf

Something to add? Let us know, at Mastery.flight.training@cox.net

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Stressed-Out Propellers

Worth repeating, this week from the [FAA Safety Team](#):

Are you operating your propeller under stress? Are you damaging your propeller? Will your propeller suddenly fail? You will likely respond with a confident - NO! But wait! How do you know for sure?

If you want to be sure, obtain and read FAA Special Airworthiness Information Bulletin SAIB NE-08-21, dated May 14, 2008. Yikes! 2008! Yes, it is dated, but the information could save your life; because what you don't know can hurt you! Consider the following.

Does the piston engine aircraft you work on or operate have a range of restricted propeller RPMs? Does it have a maximum propeller RPM indicated on the tachometer? Many aircraft models do. Some aircraft may require a placard or marking that states, for example, "Avoid continuous operation between 2,000 and 2,250 RPM".

Such limitations typically result from certification testing when increased propeller stresses are observed during certain operating conditions. Operating in these ranges can result in some very significant vibration. Prolonged violation of such restrictions could result in structural damage to a propeller, leading to propeller failure or internal engine component failure, such as the crankshaft. Ask yourself the following:

- When was the last time you had your tachometer accuracy checked? It might be out of calibration resulting in propellers being operated in a restricted RPM operating range or causing propellers to exceed their maximum propeller RPM without your knowledge.
- Is it possible the restriction placards in the aircraft are no longer correct? If so, there is an increased risk of exposing the propeller to damaging vibratory stresses.
- If a tachometer was replaced or modified, does it have the proper markings, such as redlines, yellow arcs, red arcs, green arcs, or other noted limitations?
- Are instrument panel placards for RPM restrictions incorrect, illegible, or missing?
- If a propeller and/or an engine was replaced or modified, are the propeller RPM restrictions or placards still providing correct information?

Ponder this: **On June 18, 2012, a Piper PA-28-200, lost about 6" of the tip of one propeller blade while still in flight! It can happen - and does happen!** (BTW, although the pilot described "a violent vibration," he made a successful precautionary landing at a nearby airport.) If you keep the stress off the propeller, you will remove stress from yourself.

See www.faasafety.gov

What's *your* experience? Let us know, at mftsurvey@cox.net.

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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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