



FLYING LESSONS for July 15, 2021

FLYING LESSONS uses recent 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 airplane have little direct bearing on the possible causes of aircraft accidents—but knowing how your airplane's systems respond can make the difference in your success as the scenario unfolds. So apply these *FLYING LESSONS* to the specific 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:

A newly-purchased airplane with four aboard began its takeoff roll on a hot, clear dawn. The pilot had plenty of experience in the type, and the four likely beamed with the prospect of an enjoyable morning flight.

But something went horribly wrong. The airplane wouldn't climb, or something caused the pilot to abort the takeoff—we don't yet know these details. The airplane passed the end of the 4400-foot runway and continued across roughly 1000 feet of clear space beyond. It reportedly began to burn before coming to a stop on a road just beyond the airport grounds.

I don't usually include photos of accident airplanes, because most times the actual photo adds nothing to the *LESSONS* we might learn. I will show a photo this time to show the extent of the fire, because knowing just how intense it was and how extensively the airplane burned is pertinent to this week's discussion.



We don't know what happened. As I've said many times before, that's what the NTSB is for. The highly unusual circumstance this time is that the pilot survived to tell investigators. All four escaped from the airplane with only relatively minor burns.

Whatever the cause of the crash, I commend the pilot and passengers for their rapid evacuation of the airplane...cases like this almost universally end far worse. Preparing passengers for an emergency evacuation is this week's *LESSON* from this horrible event.

As Pilot-in-Command you are legally required, and morally obligated, to provide a safety briefing to your passengers. For U.S. readers, [14 CFR 91.107](https://www.ecfr.gov/cgi-bin/text-idx?node=pt14.2.91&rgn=div5#se14.2.91_1107) requires briefing passengers on the use of seat belts and shoulder harnesses. But your obligation to your passengers goes deeper than that.

See https://www.ecfr.gov/cgi-bin/text-idx?node=pt14.2.91&rgn=div5#se14.2.91_1107

FAA Safety Briefing editor (and *FLYING LESSONS* reader) Susan Parson suggests in an article the [elements of a good passenger safety briefing](#). These elements include:

- **Seat belts and shoulder harnesses.** Under U.S. rules, you cannot legally take off unless, per the Regulations, "the pilot-in-command...ensures that each person on board

is briefed on how to fasten and unfasten that person's seat belt and, if installed, shoulder harness." Further, "no pilot may take off, land, or...cause (an aircraft) to be moved on the surface" unless *all* passengers (not just "required crew members, or front seat passengers) have fastened their seat belt *and*, if installed a shoulder harness.

You need to show passengers how to buckle and unbuckle (for purposes of evacuation) the restraints, and how to tighten them for flight and cinch them down as far as possible if you direct.

See <https://www.faa.gov/files/gslac/library/documents/2007/Jan/14082/6.5%20Passenger%20Safety%20Briefing%20JanFeb07.pdf>

FLYING LESSONS readers are probably aware of my strong stance toward shoulder harness installation and use, reflected in several *LESSONS* and studies of real-world crash outcomes over the years. The U.S. Federal Aviation Administration (FAA) and National Transportation Safety Board (NTSB) have repeatedly advised pilots on the tremendous survival advantage of shoulder restraints in survivable airplane crashes. In 2012 NTSB formally recommended the FAA enact regulation requiring all light airplanes be equipped with shoulder harnesses. FAA pushed back, citing economic factors including insufficient structure to support shoulder harness installations in some legacy aircraft. More recently NTSB has added recommendations about [the benefit of seatbelt air bags](#) to improve your chances even more in the event of a sudden stoppage.

See:

https://www.ntsb.gov/safety/safety-recs/_layouts/ntsb.recsearch/Recommendation.aspx?Rec=A-11-004 https://www.ntsb.gov/news/press-releases/Pages/NTSB_Study_Shows_that_Airbags_can_Provide_Occupant_Protection_in_General_Aviation_Accidents.aspx

Short version: Use seat belts and shoulder harnesses *at all times*—you won't have time to fasten a shoulder harness when you need it. If you have any say as to whether the airplane you fly has shoulder harnesses installed, and it does not, get them installed *now*. Don't fly in an airplane without shoulder harnesses.

Susan's article continues:

- **Emergency exits and evacuation.** Passengers need to know *how* to activate emergency exits, including alternates to the door through which they boarded the aircraft (such as openable windows and baggage doors). If a passenger isn't able to open the exit or you don't trust him/her with the knowledge of how to open doors and windows, it's wise to bring along a companion who is capable and can be trusted. If that's not possible it's all up to you...which of course it is anyway, as pilot-in-command.

The seating and exits configuration of some airplanes will require passengers to exit in a particular order. You need to tell them *how* to get safely out as well, and be ready to enforce that direction if the time comes.

Passengers need to know *when* to evacuate. As part of your passenger safety briefing

Passenger SAFETY Briefing

N _____

S Seat belts fastened for taxi, takeoff, landing. Shoulder harnesses fastened for takeoff, landing. Seat position adjusted and locked in place.

A Air vents (*location and operation*). All environmental controls (*discussed*). Action in case of any passenger discomfort.

F Fire extinguisher (*location and operation*)

E Exit doors (*how to secure; how to open*). Emergency evacuation plan. Emergency/survival kit (*location and contents*). Equipment (*location and operation*).

T Traffic (*scanning, spotting, notifying pilot*). Talking ("sterile cockpit" expectations).

V Your questions? (*Speak up!*)

make it clear that if you give a signal, such as "Evacuate! Evacuate! Evacuate!" that they should exit the airplane *immediately*.

Passengers need to know *where* to go after an evacuation to get safely away from the aircraft. I brief passengers that unless conditions make it impossible after exiting the aircraft they should **move toward the tail of the airplane and keep going** until they are far away. I'm directing them to go away from the things that may burn or explode—the engine and fuel tanks—and to an area where we can all meet up to ensure everyone is out of the aircraft.

The article contains additional suggestions for the passenger safety briefing, and a handy mnemonic to help you create your own briefing customized to the aircraft and the audience. It's definitely worth the read.

See <https://www.faa.gov/files/gslac/library/documents/2007/Jan/14082/6.5%20Passenger%20Safety%20Briefing%20JanFeb07.pdf>

Now that the airplane and occupants are prepared for flight, think about what you would do in the case you actually need to carry out your evacuation plan. **You'll tell them, loudly, when it's time to unlatch seat belts and evacuate** the airplane. They are **not to start until you tell them to do so**, unless the airplane has obviously stopped moving and you are not able to direct evacuation.

Expect your passengers to be scared to the point of panic. You need to step up and **command, in a command voice**, what you need them to do—your strong leadership and direction may help to focus them on their immediate survival needs.

Let's be honest. We don't want to have to have this type of discussion with our passengers. It may scare some away from flying with you (or anyone), ever. But you owe it to those who trust you to prepare them for the very unlikely event of an emergency evacuation. Compare it to the airline safety briefings most of us have heard a hundred times.

Make sure your passengers know, at a bare minimum:

1. how and when to use seat belts;
2. how and when to get out of the airplane in an emergency, and
3. where to go after they do.

In the conflagration that followed the takeoff crash, I'm convinced the three passengers and the pilot could not have made it out alive without a plan, and immediate execution of that plan under the likely strong direction of the pilot. Anything less would have left only disaster.

Prepare your passengers and the aircraft before flight, so they will be ready to respond to your evacuation commands and save themselves, allowing you to follow and save yourself.

What do you think? Continue the conversation at mastery.flight.training@cox.net.



See <https://pilotworkshop.com>

Debrief: Readers write about recent *FLYING LESSONS*:

Reader Dennis Wolf starts our Debrief discussion about [last week's LESSONS](#) on aeronautical decision-making:

This week's *FLYING LESSONS* reminds of a series of articles Jim Albright wrote recently in *Business and Commercial Aviation* about "[being a better crew member](#)." The one I read yesterday was about how to be a copilot when the captain wants to do something unsafe. The three stages of counteracting dangerous decisions are questioning, advocating, and insisting. One of the best aviation articles I've read in a while, and certainly applicable to ADM.

Thanks for that reference, Dennis. The challenge is to have this "pilot flying/pilot monitoring" with ourselves when flying a single-pilot aircraft—an act made far simpler with good personal limitations and the use of checklists to ensure nothing is missed. Your note reminds me also of astronaut, safety expert and *FLYING LESSONS* reader Charlie Precourt's video series "**What Good Looks Like**," which he created for the (Cessna) CJ Pilots Association and which is [reported here by AOPA](#). All these ADM skills are adaptable to flying any airplane, single pilot or crew.

See:

<https://www.mastery-flight-training.com/20210708-flying-lessons.pdf>

<https://aviationweek.com/business-aviation/maintenance-training/being-better-crewmember-part-2>

<https://www.aopa.org/news-and-media/all-news/2020/may/pilot/turbine-videos-what-good-looks-like>

Increasingly frequent Debriefers Brian Sagi adds:

Thank you for another excellent and enlightening *FLYING LESSON*. With pilots of almost any experience level, an eye-opening instructional flight I like to conduct is to fly VFR in our local area in San Diego. We **fly when the weather is imperfect**, and preferably at night. Maybe something like a 3000-foot ceiling and 5-mile visibility. Note that this is **well above VFR minimums**. Maybe we will even fly a short local cross country, and then descend through a hole in the overcast layer. Perhaps we will even fly this training flight at night.

Nearly universally, **the experience is eye-opening**. Even pilots who have hundreds of hours of experience flying in the local area observe **how easy it is to get disoriented**. This leads to a good Aviation Decision Making (ADM) discussion on *VFR operations in marginal VFR conditions*. We also talk about **cockpit resources** such as utilizing the terrain page of your GPS, as well as loading some form of **lateral and vertical guidance** to aid in situational experience. The latter is either an instrument approach or even just using the OBS mode of your GPS to create a “poor man’s localizer.”

Great, Brian. Way back when I was a new instructor teaching in Cessna 152s in Missouri I had a list of what I called post-graduate training options for pilots who had recently passed their checkride, and for other pilots in the area. The options included an introduction to what is now Class B operations (then a Terminal Control Area, or TCA) at nearby—but sixty or so miles away—Kansas City, Missouri; night cross-countries; introduction to instrument rating and commercial certificate tasks and maneuvers; and pertinent to your comments, cross-country flight in marginal VFR conditions. All were designed to introduce and improve a pilot’s skills, prepare them for what might be the next step in their personal aviation development; and most importantly, to give pilots new goals and the thrill that comes from safely mastering new skills and new capabilities. So many pilots drop out, I’ve seen, after passing their checkride and suddenly having no goals and no structure...a letdown after working so long and so hard toward a major milestone. Thank you, Brian. I’d enjoy reading a few stories from your experiences providing this training, and I imagine readers would as well.

Reader Tom Black comments via FaceBook:

I teach my engineering students: **Murphy’s Law**: Whatever can go wrong will go wrong, and Lunny’s Corollary: If you have to ask “what can possibly go wrong?” then don’t do it. Instead ask, “How will I recover from this when it *does* go wrong and does so at the worst possible moment?”

Wise words, Tom. And reader/engineer Fred Herzner adds:

It is my belief that many of the individuals that are going to make these kinds of decisions have **a history of behavior that “send the message” that they will do bad things again**. I also think that the folks that have the opportunity to observe them can pretty well make an evaluation that the individuals “can’t be trusted”. That being said, I despair at the fact that, although that person can’t be trusted, **there is no legal means to stop him/her from getting a license without fear of getting sued**. It is like watching a train wreck. Simply put, I think this is a problem without solution. UGH!!!

I wonder whether that is the ultimate conclusion also, Fred. A musing for another time: it flying an ultimate freedom, ruled by free will and the right to make choices that others see as bad behavior; or is flying a discipline, and entry into a larger community with a responsibility to protect that community as well as ourselves? I’ve thought about this for a long time...but I’ve not quite figured how to articulate it yet. While you stand by, readers, let me know your thoughts.

Reader and outspoken aviation attorney Robert Katz wrote about the Aspen, Colorado Controlled Flight into Terrain crash that served as one of the examples prompting last week’s discussion:

One of the most *pathetic* displays of gross pilot negligence I have ever witnessed (via LiveATC.net & FlightAware.com). Listen to how the FULL ROUTE CLEARANCE with the LINZE NINE SID (the ONLY way out of ASE) at 17,000 feet was **rejected** by the pilots so they launched DIRECTLY into 14,000’ terrain on a clear day with the sun at their backs. You *do* want

to listen to *all* of the exchanges between pilot and ATC from the ground up and look at the track on [FlightAware](#). One of the pilots had BIG IRON type ratings.

Identical circumstances to [this incident from last October](#). When will we, as a community of pilots, ever learn?

That is my frustration as well, Robert...and why I'm wondering if we've made any progress with the introduction of the risk management-based Airman Certification Standards.

See:

<https://flightaware.com/live/flight/N36JJ>

<https://www.foxnews.com/us/florida-newlyweds-killed-plane-crash-colorado-honeymoon-wedding>

Reader/instructor John Rosenberg writes:

I've said it a million times. I preach about it, and I've written about it, and I'm sticking with it. **...Not enough emphasis early in a student pilot's training on what it really means to accept the responsibility and carry the weight of that responsibility of being the pilot in command....**[14 CFR] 91.3.

How much time does a typical flight school instructor spend with their students philosophizing about the gravity of what it means to strap into the left seat, feel the weight bearing down on their shoulders that the well-being of their passengers and the safe outcome of the flights rest solely in their hands. Yes, the PTS morphed into the ACS with the added emphasis of ADM, but *how is it being taught?* How do the instructors convey this concept to the students? It all sounds great in theory, but the accidents are the result of something missing, and, admittedly, I don't have the answer. Instructors are guilty too i.e. your second accident example.

With the explosion in student starts at the flight schools, there is high demand for aircraft time and instructor schedules are maxed out. At my local airport the flight schools' Pipers and Cessnas are constantly in the air which makes for very busy airspace. I'm sure you're seeing this in Wichita as well. Instructors have their hands full and the cockpit is not the ideal classroom.

How ADM is being taught, how it is being evaluated on Practical Tests, and how/whether a pilot can be prevented from being recommended for a Practical Test because he or she flies great but does not exhibit good ADM as outlined for training by the Airman Certification Standards (ACS), or how/whether an examiner can fail a certificate or rating candidate solely on the basis of that person's ADM as evaluated by those standards despite his/her performance on knowledge and the flight maneuvers, is the quandary last week's cited examples (and many more) set me on contemplating the measurable outcome of the change to the ACS by posing these five questions:

1. What did the change to ACS do to prevent the types of decision-making apparently responsible for causing these crashes?
2. How could a pilot train for and earn a Private Pilot certificate under the ADM-heavy Airman Certification Standards and still make seemingly unreasonable and ultimately fatal decisions only a few months later?
3. (For instructor pilots): Does the training and checkride preparation you provide Private Pilot students under the ACS fully prepare those pilots to make decisions that would prevent these types of accidents?
4. (For pilot examiners): Do ACS-based Practical Tests identify and fail applicants who might make decisions like those that led to these accidents?
5. (For regulators): If ACS-based training and evaluation do not prevent these types of accidents, was the massive change from PTS to ACS meet its goals?

Reader, pilot examiner and at one time director of safety for a major international airline Wally Moran wraps it up by addressing my last question:

After hundreds of flight tests since 1996, I can say emphatically the answer to question #5 is NO—at least, In my opinion.

Thank you for your frank assessment, Wally. So readers, instructors, evaluators and examiners, where do we go with ADM from here?

I'll have more reader comments on this and other topics next week.

Questions? Comments? Send them to mastery.flight.training@cox.net.

FLYING LESSONS welcomes a new sponsor this week, the National Association of Flight Instructors (NAFI). I'm a Life Member of NAFI and have been privileged to have served on its Board of Directors in years past. When NAFI approached me in support of *FLYING LESSONS Weekly* I was honored and happy to accept. Welcome aboard, NAFI!



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See www.nafinet.org.

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