FLYING LESSONS for January 24, 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.

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:

The pilot of a single-engine airplane "experienced engine failure" during an instructional flight. It became apparent the pilot could not make it to the airport, so he deployed the ballistic recovery parachute approximately two miles short of the runway. Although the airplane was severely damaged (likely destroyed) when it descended into power lines, the three aboard the aircraft "walked away," according to first responders interviewed in a local news video.

Attitude—both aircraft and pilot—may have played a part in this event, and helped dictate the outcome.

Faced with power failure, the single-engine pilot and his instructor entered a glide toward the nearest runway. For every power setting there is a pitch *attitude* that results in an indicated airspeed. Indicated airspeeds are often the targets for predictable aircraft performance. In the case of total engine failure (Power = 0) there is a predictable attitude that results in Best Glide speed.

Best Glide is the indicated airspeed (adjusted downward for weight, although most Pilot's Operating Handbooks don't give us guidance) that nets the best forward distance for altitude lost. Actually, Best Glide is a function of Angle of Attack, but most light airplanes do not have AoA indicators so we use airspeed as a surrogate. Regardless of the instrument you reference, ***hold the right attitude and you'll get the best possible performance***.

The second "attitude" in this event is the mental *attitude* that permitted the pilot to stop trying to fly the airplane and instead to exercise the option of the ballistic parachute. Could the three have walked away if the pilot continued his glide to a landing? We'll never know. We do know, however, that the decision to deploy the 'chute was a good one. The outcome proves it.

Friends who have taught in military pilot training programs tell me one of the hardest things to teach is when to give up trying to fix an emergency and to abandon the airplane. In this case, of course, the pilot and passengers didn't jump—they didn't have to in order to "bail out" of the glide. And of course the "hit the silk" option isn't available for most pilots.

The instructor is quoted as crediting the Cirrus Owners and Pilots Association's pilot training program as preparing him for the critical decision to abandon the glide and deploy the parachute. It's obvious from this case that **type-specific pilot training works**…and that the pilot who takes training to heart, and continually reviews the emergency procedures, will be best prepared to survive in the unlikely event he or she must do precisely the right thing at precisely the right time.

See www.cirruspilots.org/

'Chute or no, we can all learn from this that in an emergency there may come a time when we have to ***stop trying to fix the problem*** and simply ***get on the ground as softly as possible***, whether that means by gliding or using a parachute. This even translates to less catastrophic scenarios than a total engine failure—a reminder that there are only so many things we can fix

from the pilot's seat, and that well-practiced emergency procedures are designed to give us whatever best options remain available.

Your *FLYING LESSONS* assignment for the week: Review the Emergency Procedures section for the airplanes (or aircraft) you normally fly.

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

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Debrief: Readers write about recent *FLYING LESSONS:*

We've had several member responses to last week's *LESSONS* about the triple-fatality Beech Bonanza engine failure and crash into a house in Florida, and the ATC recording that suggests a potential conflict between the priorities of pilots and controllers in some emergencies. Reader Tom Allen writes:

> Last week's *FLYING LESSONS*, what a tragedy. I was at a Beechcraft fly-in and one of the…instructors and I had the same concern. The rate of amendments from the controller was higher than we were able to respond. He said, "It is an accident waiting to happen" I agreed. Seems there should be some additional training around the role of ATC and PIC.

See:
www.mastery-flight-training.com/20130110flying_lessons.pdf
http://archive-server.liveatc.net/kdab/KDAB-App-Dep-Jan-04-2013-1900Z.mp3

I have it from good authority that as a result of my online and personal *FLYING LESSONS* request that investigators are looking at that specific aspect of this tragic case. Reader Shirley Roberts adds:

> What a tragedy. From my reading, the pilot didn't say those magic words: "I have an emergency." And after giving number of souls on board, he could have, as you said, described exactly what he wanted. So often, we **pilots seem reluctant to express the seriousness of a situation** or perhaps **cannot make our mind believe it**. ATC is there to help but cannot be a mindreader.

Exactly. As I wrote, although the controller seems to have known an emergency existed despite the pilot's failure to overtly declare it as such (the controller would not have asked about "souls on board" and "fuel on board" unless he was treating the situation as an emergency), when the controller suggested a vector toward a long straight-in approach—one that appears to have taken the airplane miles further from the airport than when he first reported the need to divert—the pilot blindly accepted directions and did not assert his need to go directly to the airport, then descend until below the 900 foot ceiling directly over the field.

Interestingly, I'm writing this while training instructor pilots at Spruce Creek Fly-In residential airpark near Daytona Beach, Florida, where readers report the pilot of a North American T-6 Texan did exactly that just a few days after the Bonanza crash—he experienced a partial power loss in flight over an overcast, maintained altitude until over the airport, then spiraled down successfully to land without further damage or injury. Maybe the pilot had heard about the

Bonanza event and though about what he'd do in a similar situation, then executed on that pre-planned decision when it actually happened to him…learning his *LESSONS*.

Frequent Debriefer David Heberling adds:

> When I bought my airplane in 2008, the propeller had no record of any maintenance for 19 years. I saw red fluid coming from the hub and promptly had the prop overhauled. I plan on doing an IRAN [Inspect and Repair As Necessary] on the prop every five years. My philosophy is that I focus my attention on those things that can kill me or in the case of a landing gear malfunction can total the airplane. They are the engine, the prop, the landing gear, and corrosion control. I feel that all the whiz bang avionics do not make up for a neglected engine or prop. **The propeller usually takes a back seat to everything else on the airplane**. I do not know if this is from ignorance or just sheer neglect.

Excellent point, David. For all the incredible stress encountered by the blades of an aircraft propeller, critical propeller maintenance and even preflight inspection is routinely deferred or ignored until a problem occurs.

While reader Doug White observes:

> Regarding your article of [last] week I believe that **both ATC as well as the pilot(s) have their own responsibilities to make sure each flight is completed safely**. After all, I understand that **the 'main' responsibility of ATC is to keep airplanes from running into each other**.
>
> That being said, I also believe that both pilot and controller can and should have every tool available to them to make each flight safer.
>
> I understand that, at one time, every control tower had to have a licensed pilot on staff. Whether that's true or not, I think *that every shift at every tower*, from Podunk City to DFW, should have a current licensed pilot on duty, or closely available. Now, I'm not going to argue here whether they should be IFR rated, a minimum number of hours, multi-engine, etc. We can kick that around in another forum. But, **at minimum [controllers] need to have some knowledge of the operation of an airplane and need to KNOW exactly what the pilot in distress is looking at and going through**. In this case, any SEL pilot would know that a clanking inop propeller does not leave a lot of wiggle room for long drawn out traffic patterns.
>
> A typical bureaucratic argument would be "We can't afford it!" Bull! There is so much waste in any government agency that millions can be found. [The] current budget at FAA is something close to $20 Billion, so we can get a fair amount of licensed pilots for that money. Besides, give any applicant to ATC who holds a current pilot's license, extra consideration in the hiring process.
>
> Anyway, listen to the this emergency. You will hear three different controllers at two different centers. The second controller is a licensed pilot, jet time, 3,000 hours, etc. The first controller is no pilot. Tell me which one actually gets the passenger/pilot settled down?
>
> Why? Because she actually had him DO SOMETHING. Not just "hang in there."
>
> The last controller has another controller sitting beside him who was quick thinking enough to call a friend of his 1000 miles away…who [is] a very experienced pilot, and they were asking and answering questions in the cell phone (probably an FAA violation) and telling them to the controller who was talking to the pilot, and the relays went back and forth like that.
>
> After listening to this tape, tell me, does having experienced pilots as ATC offer *any benefits* to aircraft in distress?

See www.youtube.com/watch?v=XhMom-YHgoU

I'll let *FLYING LESSONS* readers listen and let us know what they think.

Reader Mike, who provided permission to publish his comments but did not provide a last name, writes:

> Here's my piece. Not all controllers are pilots and not all pilots are controllers. Given that fact **we need to be clear in what we want as pilots when and if we have an emergency situation**.
>
> Case in point: Many years ago, I was flying back to my home airport and a cold front that was supposed to be some time after my planned arrival beat me to the airport. I was VFR and my home airport was now IFR, and I was low on fuel due to a longer-than-planned route back home. When I called the tower for clearance to enter the Class D and land I was told "unable" because the field was IFR and there [were] two other aircraft sequenced to land before me even though I could see the airport from my position.

> The tower operator suggested I contact the nearest FSS and request an IFR clearance. I called Center instead and asked for an IFR pickup (I and my aircraft, a Piper Cherokee were IFR rated) and **let the controller know I was low fuel**. The controller (after giving me a squawk and identifying my aircraft) took me up into the cloud deck, over a local VOR and gave my vectors circling back to the airport. In the clouds, I ran one tank out of fuel and my engine quit. Switching tanks, the engine restarted and as I was being vectored in IMC the other two aircraft landed. I broke out about 500 ft AGL on the centerline and landed, while the crash trucks lined the nearest taxiways.
>
> Moral of the story: If I had to do it over again, **I would have immediately declared an emergency** and stated to the controller that I was minimum fuel. I could see the airport visually and I was proceeding to land there and **he would have to move the others out of the way** while I did so. I calculated later that I had approximately 10-15 minutes of fuel remaining until the last fuel tank ran dry. Having the experience of 28 years of aviation by now, and [as] a current CFII, for goodness sake **tell the controller what you need and want**. After souls on board and fuel, they want you to state intentions. **Let them know, right now**. **You are the PIC and in an emergency you need the closest airport and a DIRECT vector to it**, or if not tell them what you plan to do.
>
> Too often we let the controllers direct when we should be taking charge. Remember they are there (the reason they have a job) is to help us pilots fly safely. In an emergency, your tail is on the line, not theirs, so do whatever it takes to fly safe.

Thank you, Mike, that's exactly the point. What controllers think pilots want isn't always what pilots need in an emergency. As you said, **the pilot needs to tell ATC what he or she needs to do**. It's comforting, and very helpful, to get directions and monitoring from ATC. But also as you said, the pilot needs to command the situation. My point is that pilots and controllers need to learn more about what the other is expecting before the need arises. Thanks again.

I discussed the Bonanza incident this week with a retired Air Traffic Controller and current Civil Air Patrol flight instructor, John Foster, who lectures to pilots on controller responsibilities and how we as on pilot-in-command interact and benefit—as well as the limitations of the relationship. John makes a great point, that controllers are there to separate IFR and participating aircraft from other IFR and participating aircraft. Although at times they may provide information about weather, terrain clearance and other safety factors, **an ATC clearance merely guarantees that no other participating aircraft is using the airspace you plan to use**. It does not "clear" the pilot to violate any regulations or to proceed along the optimal route; a clearance just gives the pilot assurance that no other participating airplane will conflict with what the pilot says he wants to do. In an emergency, the controller will try to help, but it's the PIC's job to define what that routing will be.

Reader Louis Olberding continues the discussion:

> As I was listening to the audio from this unfortunate and sad event, I kept going back to the morning you and I spent flying together last June. I still vividly remember the importance of pointing the aircraft to the nearest airfield or suitable landing spot, maintaining altitude as best as possible, and configur[ing] for best glide. It was definitely an eye opening experience for me as we discussed during and after.
>
> Luckily I was able to experience this scenario…through you and the Beechcraft Pilot Proficiency Program. I have practiced this scenario and procedure many times at my home 'drome and it does take some time to figure out. Through practice I feel like I have a very good idea of how my aircraft will respond and that I will definitely have a better chance to get it on the ground safely.
>
> I guess my point is that I wouldn't have been able to do this without getting out and practicing on my own. As a relatively new pilot, I still have that eagerness to learn and I do that best through going out and doing the maneuvers. **We just have to and we owe it to our passengers**.
>
> What I have learned from [the Florida Bonanza] accident is that it is of the utmost importance to be the PIC and take charge of the situation, and be very clear with ATC what my needs and intentions are. Keep up the great work.

See www.bonanza.org

Thanks, Louis. David Abrams carries this even further:

> I agree with your analysis of the audio communications of the Bonanza crash in Florida. One thing struck me about the communications; the pilot never declared an emergency. I wonder if many of the issues you point

> out (e.g., not being vectored straight to the airport, not being switched to a less busy frequency) might have been different if he had. The controller initially was only told there was a vibration and oil fluctuations. It's not clear to me if he understood how serious this was (particularly in IFR conditions). At one point the pilot states that he has no oil pressure but not that his engine has failed (which if it had not already it would soon).
>
> My take-home on this incident is **to declare an emergency early rather than later**. I don't know if it would have made a difference in this case, but it would have removed a possible misunderstanding between the pilot and the controller over the seriousness of the situation.

Thank you as well, David. Reader Juan del Azar speaks from experience:

> Tom, many thanks for the article which kept my mind troubled for a while today. In hindsight, it is easy to say what could have been better done by both controller and pilot. But perhaps as you implied there could have been a reasonable chance to save lives and damage. I have been engine out [in] IMC, at night, and know how lonely and extreme it can be. ATC is safe on the ground, and ALL resources should be devoted to an airplane in distress. I am not familiar with the controllers rules and procedures, but we don't need to be mechanics to figure out that low oil pressure and propeller vibration while in IMC grants upmost priority and sensitivity. While the pilot sounds composed, I find it hard to believe that ATC demand any more brainpower from him—changing and sharing frequency, unnecessary chat, etc—besides putting that airplane down safely. Would the outcome be different if the pilot had been more assertive? Is it *necessary* to be more assertive with an engine out while in IMC? Why accept vectors for a base leg and long final instead on a Direct-to Vector?
>
> My personal experience taught me that [it] is very hard to do much besides maintaining control of the aircraft. I can imagine the aircraft vibrating and making loud noises. Can ATC [imagine that] as well? What specific recommendations based on this unfortunate event would you make for both ATC and pilots?

Hmmm…I suggest this:

- Pilots:
  - Although controllers may have legitimate curiosity about what's happening, keep it simple in order to convey the seriousness of your situation: "I have a partial power loss," "I have a total engine failure," "I have a Low Fuel Emergency," "I'm giving a Minimum Fuel Advisory," etc.
  - As several have said, declare an emergency earlier rather than later, to get priority handling so you can get on the ground fast.
  - Tell the controller what you want. Don't wait to be told what to do. Generally, with any engine or fuel problem you want to go directly to the nearest suitable airport at your current altitude (to have the greatest number of options should the engine quit).
  - Understand that controllers are genuinely trying to help, by giving you what they think is the easiest thing for you to do—typically, a long, straight-in approach. Be willing to tell the controller when his or her suggestion is not what you need to do.
- Controllers:
  - On the leadership level, reassess whether knowing the number of souls on board and fuel remaining needs to be done early in the response to a reported emergency. Such questions can be very distracting, especially when the pilot is just beginning to assess and respond to the situation. The answers can wait until the airplane is pointed somewhere and the pilot has the issue better under control.
  - Understand that especially in single-engine airplanes, altitude is a valuable commodity. Pilots with engine problems will want to maintain altitude as long as possible.
  - If the pilot does not command it, ask if the pilot wants to fly directly to the airport at altitude, to descend closer in, or if he or she wants to be vectored away for a long straight-in approach. Such a reminder might prompt a pilot to think and act.

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

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Thank you, generous supporters

What Would *You* Do?

NASA's Aviation Safety Reporting System (ASRS) has released *Callback #396*, containing these items:

> *On departure, the gear retracted normally. However, immediately after retraction I heard a loud "POP" followed by a call from Tower indicating that my left main gear had retracted then fallen down again. Another aircraft behind me confirmed seeing the same thing.*
>
> *The aircraft has a gear mirror installed on the right wing which allowed me to view all three gear. The left main was in a trailing position. The nose and right main were retracted. I cycled the gear. The left main didn't move from its in-trail position.*
>
> *I advised Tower that I would troubleshoot the gear and tried yawing the aircraft and maneuvering so as to swing the gear with inertia into the locked position…. Unable to retract or extend the gear, I made a call…to an A&P to confirm my suspicion that it was most likely the gear actuator that had broken loose from the pivot point…. I could land with the right main and nose gear down and locked or fully retracted. I could also land under power or secure the engine and try to save the engine and prop.* ***What Would You Have Done?***
>
> *I had planned to leave at 0730, but the weather was 500-foot ceiling and 2 miles visibility. The lowest approach minimum at [my destination] was 1 mile visibility and 800 foot ceiling. The runway was short (2,000 feet) and there were no approach lights. I waited over two hours for the weather to improve, but it didn't. I decided to request a Special VFR clearance after phoning the destination FBO. They told me the visibility there was at least 3-4 miles and the ceiling was definitely 500 feet or better. I assumed the ceiling would be at least 500 feet all the way on the 4-5 minute flight. When I got a few miles east of the airport the ceiling suddenly dropped and I had to decide whether to stay at 500 feet AGL and pop into the clouds or descend to remain clear.* ***What Would You Have Done?***
>
> *When I had flown the route IFR earlier in the day the ceilings were about 3,500 to 4,000 feet. I decided to make the return trip VFR with flight following and stay under the 3,000 foot floor of the…Bravo airspace since that is what ATC would have had me do had I filed IFR. All was well until I reached the shoreline. I was at 2,700 feet and I was cleared by Approach through the Class D at or above 2,500 feet, but I had to stay below the Bravo airspace at 3,000 feet. As I reached land, the ceiling dropped to just about 2,700 feet so I descended to 2,500 feet, but that still put me in the base of the clouds. Then ATC warned me about traffic ahead on a missed approach and suddenly I found myself trapped in and out of the clouds, unable to descend without busting the Delta airspace. Meanwhile I could not see the traffic which was being called out straight ahead by the traffic warning system.* ***What Would You Have Done?***
>
> *On takeoff roll approaching 80 knots, the Tower Controller called us and said in a very slow, unsure voice, "[Callsign 1…2…3…4…](pause)." He sounded as if he had something to tell us, but did not know what to say. We both noted a tone of concern and hesitation in his voice as if he was still unsure of something at that moment. We were light weight and had 13,000 feet of runway ahead of us. We had to make an immediate decision.* ***What Would You Have Done?***

What did the reporting pilots do? Learn from "the rest of the story" in *Callback #396*.

See http://asrs.arc.nasa.gov/docs/cb/cb_396.pdf

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

Great Lakes International Aviation Conference

I hope to see *FLYING LESSONS* readers this week at the Great Lakes International Aviation Conference, on the campus of Eastern Michigan University in Ypsilanti, Michigan. Review the program and seminar schedule, and if you're in the Detroit area, stop by my presentation "Magenta Line Thinking: Overcoming Automation Dependence," Friday at 2:00 pm and Saturday at 3:30 pm.

See http://greatlakesaviationconference.com/

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2010 National FAA Safety Team Representative of the Year
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