FLYING LESSONS for
October 6, 2016

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.

This week’s LESSONS:

Two scenarios from the airline world, and why they matter in single-pilot airplanes…

Scenario 1

The First Officer of a Regional Jet operating under a code-share agreement to a major airline, who is also a FLYING LESSONS reader, related a recent experience. About 10 minutes after departing from a major hub airport a flight attendant (FA) telephoned the cockpit informing the crew that a passenger was having a medical emergency. No one had responded to the FA’s query of the passengers to see if any had medical experience. The FA indeed had past medical experience and was caring for the passenger as much as conditions permitted. The FA recommended the crew land to deliver the passenger to skills medical assistance.

The Captain agreed, and handed control of the aircraft to the First Officer (FO). The Captain (CA) then began coordinating with company dispatchers over the radio while maintaining contact with the FA to track the passenger’s condition. The FO assumed “single pilot” control of the jetliner, running checklists, setting up for a visual approach and “working the radios” with Air Traffic Control (ATC), and flying the airplane—alone—while the CA continued to monitor the medical emergency and relay information to company dispatchers.

With only about five months’ experience flying jet airplanes and with zero experience in single-pilot operations in a crew-required jet other than a couple of simulator “incapacitated captain” training drills during new-hire indoctrination, the FO programmed the avionics, configured the aircraft, prepped and briefed for the visual approach. Reported winds were almost directly across the runway, and while doing everything else alone the FO computed the wind to be “right at” the jet’s maximum crosswind component as limited by company procedures.

The FO flew the approach without monitoring or callouts from the CA, and made a “challenging” crosswind landing. By the CA’s own choice the CA was out of the loop until the airplane was on the ground and they were taxiing to a gate. An ambulance crew met the airplane at the gate and took charge of caring for and transporting the passenger.

According to the FO, the company’s manual calls for the CA to take charge of any inflight emergency. The CA apparently interpreted this to mean handing all flight responsibility to the FO and assuming personal control of company response communications while also remaining in contact with the FA who was caring for the passenger. The FO told me that this was indeed what is called for in the regional airline’s operating procedures.
Scenario 2

This one I probably don’t have to explain. I’m talking about the “Miracle on the Hudson,” as described in the recent theatrical release *Sully*. I was able to see the film recently, and am working on the assumption it accurately portrays at least the inflight portion of the story it tells (I suspect some other aspects of the story were embellished to heighten tension, notably the conduct of the NTSB investigation and hearing, which likely was treated with some license—a movie needs an antagonist, and there’s no tension from blaming the birds).


Here’s a synopsis of the story, from the website linked above: On January 15, 2009, US Airways pilots Captain Chesley “Sully” Sullenberger and First Officer Jeffrey Skiles board US Airways Flight 1549 from LaGuardia Airport to Charlotte Douglas International Airport. Barely three minutes into the flight, at an approximate altitude of 2,800 feet (approx. 850 m), the Airbus A320 hits a flock of Canada geese, disabling both engines. Without engine power or airports within a safe distance…Sully decides to ditch the aircraft on the Hudson River. Sully manages to land the aircraft in the Hudson without any casualties.

It’s a very good movie, and it also highlights an issue I mention frequently in FLYING LESSONS: the delay between the onset of an abnormal or emergency condition that causes even a highly proficient pilot (or crew) to delay actions necessary to get the aircraft safely on the ground (or water), because of the “startle factor” and denial of an unexpected event followed the typical pilot’s actions to attempt to remedy the situation before finally deciding decisive action is needed.

As part of that reaction the crew accomplished memory steps of the published emergency procedures, additionally taking an educated leap to accomplish some of the procedures out of order to improve the chances of success…the movie does not explain why, but Sullenberger turned on the Auxiliary Power Unit (APU) sooner than the sequence of checklist steps called out, presumably to provide some additional thrust as well as assure continuation of electrical power (the APU is a fairly strong jet engine of its own, mounted in the tail, that would add some to the A320’s glide ratio).

Throughout the emergency the two acted as a crew. Sully took the flight controls (Skiles was Pilot Flying on that leg) and commanded his FO to run the Dual Engine Flameout checklist. After quickly determining that a “controlled water touchdown” on the river was their best option they probably referenced the Ditching checklist, but that was not portrayed in the movie. They advised the passengers and started the well-trained reaction of the cabin crew. A good leader, once all was done and they were committed to the water landing, Captain Sullenberger asked his First Officer if he had any ideas—knowing that no one pilot can always have all the ideas alone.

**LESSSONS for the single-pilot**

I emphasize that in both cases—the Regional Jet and US Airways 1549, the flight ended without fatalities. In both cases the crew appeared to do everything the “book” told them to do. In the case of the Regional Jet all but one passenger and crew were delayed, but were able to fly out on the same aircraft later the same day. In both cases what’s really important, leaving no one at the scene of a crash, was the result.

But what do you think is the big difference between the way these two events were handled by the flight crews?

Think about that for a moment.

I’ll wait.
OK, here’s my take: In the case of US Airway 1549, the cockpit crew worked as a team. Although the situation, as it turns out, was unprecedented, they processed checklists the way they had been trained just in case there was something that could have fixed the problem or at least improved their chances. In the heat of the moment it would have been easy to forget to do something that calmer minds had documented in the checklists years before, when the stress was not affecting their thinking and they had time and other resources to come up with the best possible procedure. Sully and Skiles did what they had been trained to do. Most importantly, in my view, they flew the airplane as close to normal as they could, removing as many variables as possible. When they had completed everything training and experience prepared them to do, they went beyond their training and did what they had to do for the passengers and crew to survive.

In the case of the Regional Jet, at the onset of a medical emergency the crew abandoned almost everything it had been trained to do. The FO was left to fly single-pilot in an airplane and using techniques he had never done before, flying a high-workload return to a busy hub airport to land at the edge of the airplane’s approved crosswind envelope without the help and quality control check of a second pilot. Frankly, other than assure an ambulance crew was waiting for the passenger when they arrived at the gate the CA added absolutely nothing to the passenger’s care or chances of surviving the medical condition—that was up to the flight attendant. However, the CA could have done a whole lot more to assure a safe and expeditious arrival at the gate for all the passengers, including the one needing attention, by remaining engaged as part of the cockpit crew and retaining command of the high-workload return and challenging crosswind landing.

Yes, the FO handled this all well. But if he had not, the NTSB investigators might have been as unforgiving of the captain and the crew as they were portrayed in the movie describing the other event.

Here’s the LESSON for the vast majority of FLYING LESSONS reader, who do not fly as part of a cockpit crew, or if they do, may at times fly single-pilot as well. In an abnormal or emergency situation, do everything you can to make the remainder of the flight as normal as possible.

Use your training. Follow your checklists. Don’t try to land faster than normal, or slower than normal, or on a shorter or busier runway than normal, unless you absolutely have no choice.

Fly like Sullenberger and Skiles, following procedures that just might work until you confirm they do not. Only then, use your experience to go beyond your training.

Don’t abandon everything you’ve practiced and try to make up new techniques and procedures, especially while you’re under extreme stress and don’t have time to detect all of the status that may affect the outcome of your flight. Practice your normal, abnormal and emergency procedures until you know them well, then review and practice them regularly. You can’t expect to be successful operating outside the normal envelope in an extreme situation if you aren’t very familiar with where the edges of that envelope lay.

You might try to abandon your training. It might turn out ok. But your actions will be hard to defend—and if anyone get hurt, your guilt hard to assuage—if something does go wrong.

Comments? Questions? Let us learn from you, at mastery.flight.training@cox.net
Debrief: Readers write about recent FLYING LESSONS:

Reader Ed Livermore writes about a recent LESSON on the GUMPS check and preparing an airplane for landing:

The discussion about changing fuel tanks on the ground before takeoff is right on point. If the selected tank is too far down, then put some gas in it before departure. Our rule is ironclad: never change tanks on the ground. Fuel selected for landing is untouched and unchanged as for takeoff – always. Thus, it’s easy to avoid this potential point of failure.

The particular LESSON was primarily about configuration for landing, but you’re exactly right: in airplanes in which we routinely change fuel tank selector positions, it’s very important to ensure the tank selected for takeoff has been selected correctly. I strongly suggest that pilots take off using the tank that was used for the Before Takeoff engine run-up. By doing the run-up you’ve confirmed there is good, usable fuel in the selected tank, and that the fuel selector is positioned properly to deliver that fuel to the engine without interruption. Switching tanks just before takeoff and/or failing to confirm fuel delivery at at least a moderate power setting may set a pilot up for fuel starvation at the worst possible moment: immediately after takeoff. It’s happened many times before. Thanks, Ed.

Reader John Scherer shares his observations about the movie Sully as well:

I think it was outstanding and a great example of making a command decision. Capt. Sullenberger had 42 years of flying experience and he put all of that to work on the fateful flight. I was very impressed with him ordering the APU started, even though that wasn’t due until much later in the checklist. It kept power to the airplane and enabled the full flight protection mode of the automatic Airbus flight control system to continue until touchdown. He had many hours in the airplane and knew it so well that he knew what he had to do and made that decision. I was privileged to know him at the Air Force Academy (he was two years ahead of me) and actually flew with him at the Academy Aero Club circa 1972. He had a CFI at that time, the only cadet I know that had one…an exceptional accomplishment at the time. Anyway, if you haven’t seen the movie, it is well worth your time.

Thanks, John. I didn’t know the Airbus’ flight envelope protection system (which will not permit the airplane to exceed pre-set flight parameters, including angle of attack) were dependent upon the APU and not available on battery power alone. Or perhaps you are concerned that the batteries would have died before touchdown. Either way, I appreciate your insights. I hope you’ve been able to catch up with your Academy CFI.

Airline pilot, flight instructor and frequent Debriefer David Heberling writes:

I am going to cover a couple of subjects here. When I was a newly minted flight instructor (at the ripe old age of 18), I was constantly moving from one airplane to the next (almost all Pipers) with not too much thought to differences among them. At least staying in one family of aircraft makes alleviates some unfamiliarity. We even did this among all of the twins we flew including the Twin Commanche, Seneca One, Aztec, Apache (with camera platform), Chief, Aero Commander 560A, and Beech 18 (tri-gear configuration). There were several things we did to try to make the task of flying this combination of airplanes somewhat easier. Vmc, and Vse (red radial line and blue radial line respectively) were sacrosanct. We trained and got check rides in a different airplane each six months. We created loading tables to make weight and balance a less onerous job. We also flew these airplanes a lot. This was in the mid ’70s to the early ’80s. Avionics were MUCH simpler back then. You almost have to take a graduate level course just to understand one
manufacturer’s navigator versus another’s now.

Even with all the sophistication that the new navigators and autopilots bring to the cockpit today, there is one thing that remains constant: The physical laws that affect flying have not changed whatsoever. This means no steep banks (over 30 degrees) in the pattern, ever. No pitch over 10 degrees anywhere (except during intentional stalls). Coordination during turns is a must. No cheating with the rudder to speed up the turn from base to final. Correcting for P-factor and torque is expected. No feet flat on the floor. Those rudder pedals are not foot rests.

I just finished reading "Missed During Preflight" by Dick Pedersen in the April [2016] ABS Magazine.* I know I should not be, but I was amazed at the cavalier attitude towards maintenance that some of my fellow aviators exhibit. It always amazes me what people are willing to crawl into and fly. I for one insist on a spotless interior of the engine cowl. Anything else just invites the cavalier attitude that one should strive to avoid. There should not be any grease, avgas, exhaust or oil stains anywhere in the cowl. If there is, that avgas, exhaust, grease or oil had to come from somewhere and the cause should be investigated before any flying is conducted. The way I look at it, mechanical reliability relies on robust maintenance practices.

Robust maintenance practices are what protect me from catastrophic engine failure. This goes for the propeller and landing gear too. Maintenance is the one place one should not cut corners to save on aviation expenses. That is penny wise and pound foolish. Malfunctions with the landing gear may not kill you, but flying with a landing gear that is all loosey goosey will cost you several magnitudes of money more than the cost of simply maintaining the landing gear in tip top condition when it ultimately fails.

Very true. Airplane glitches do not fix themselves. At best (or really, worst) they may go into remission, hiding until they return at a more inopportune time. Worse, pilots have a way of rationalizing failures and devising work-arounds when something isn’t performing as it should. It’s seemingly in our “get it done” nature—I certainly have to watch for it in my myself.

A mechanical discrepancy entices us to compensate, becoming comfortable with the reduced capability until we hardly notice the failure, if at all. When another minor discrepancy crops up we learn to accommodate it as well. After a while we can be flying an airplane with any number of issues that could go bad quickly, in the air, at night or in instrument meteorological conditions (IMC), or leaving us stranded at the “away” end of a trip or at some en route fuel stop along the way. Thanks, David.

See www.bonanza.org

*Disclosure: in my real job with the American Bonanza Society I am the editor of ABS Magazine.

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