FLYING LESSONS for January 31, 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:

Why Mastery Flight Training has no Airmanship Award

One of my goals for *FLYING LESSONS* from the beginning (in 2007) has been to create an annual award for exemplary airmanship. Several readers have suggested the same thing over the years, some making nominations of potentially worthy pilots.

The problem is that the flying prowess we laud and honor frequently masks a condition that is entirely of the pilot's making. In other words, we congratulate and reward superior flying skills we call "airmanship" that, all too often, merely rescues the pilot (and passengers) from the results of his or her poor planning and decision-making.

Take for example the *FLYING LESSONS* of last week's report. Like several others in the industry, I reported a successful ballistic parachute deployment by the pilot of a Cirrus SR20. I lauded the instructor pilot's "attitude" flying—both maintaining aircraft *attitude* control during his attempted glide to the nearest airport after reporting engine failure, and the mental *attitude* that permitted him to make the leap from trying to save the airplane to "bailing out" to ensure salvation of its occupants when it became apparent he would not make it to the runway.

See www.mastery-flight-training.com/20130124flying_lessons.pdf

I went so far as to write:

> **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/

But last Monday noon I read the new daily NTSB preliminary reports. Among them I saw the initial evidence from the Cirrus event…which includes this statement (emphasis added):

> …the flight instructor and two occupants originally departed from DXR, landed at GON [airports only 65 nautical miles apart--tt], and were returning to DXR at the time of the accident. The airplane was on approach to runway 26 at DXR when it experienced a total loss of engine power and the pilot reported that the airplane was "out of fuel" to air traffic control. The pilot elected to deploy the CAPS [Cirrus Aircraft Protection System] and the airplane subsequently descended via parachute into trees, about 3 miles northeast of the airport. The airplane's empennage separated and the fuselage sustained substantial damage.
>
> Initial examination of the airplane…did not reveal any visible fuel in the airplane's fuel tanks, nor were there any indications of a fuel spill at the accident site. After the airplane was recovered, approximately 26 ounces of fuel was drained from the airplane's fuel system.

See www.ntsb.gov/aviationquery/brief.aspx?ev_id=20130123X73100&key=1

I felt personally betrayed to learn the pilot/instructor knew he was out of fuel—he obviously ran one fuel tank dry and then switched to the other, so he knew his fuel state was

critically low before the engine quit after a 32-minute flight. With the advanced fuel monitoring capability of Technologically Advanced Aircraft (TAA) like the Cirrus, the instructor most certainly should have been aware of his near-critical fuel state before ever beginning the return flight home.

See http://flightaware.com/live/flight/N140PG.

The betrayal was complete when the pilot was widely quoted as attributing his "success" to the training he received through COPA—all the while hiding the fact that he was aware he had run the airplane out of fuel.

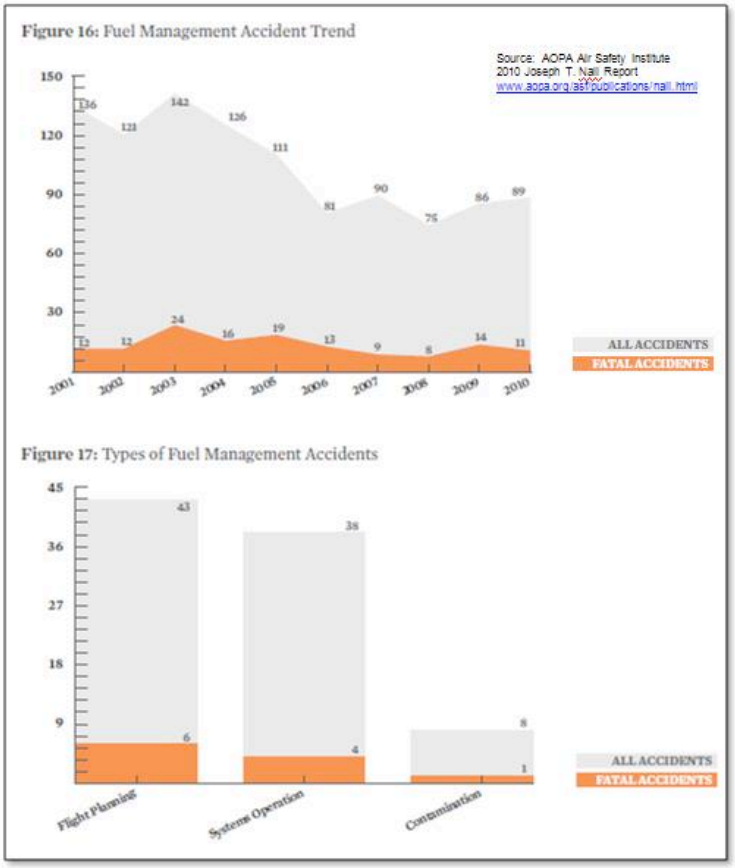
Ironically, fuel management mishaps are virtually extinct in TAAs according to NTSB final reports. It's the one NTSB-demonstrable safety improvement that directly correlates to the introduction of "glass cockpit" avionics—as I pointed out in my presentation last week at the Great Lakes International Aviation Conference.

See http://greatlakesaviationconference.com/

OK, the instructor did handle the emergency (he created) well. And it is testimony to his COPA training that *after the engine starved for fuel* he glided under control, then activated the ballistic parachute when needed. But should we applaud him for it? Or instead, should we derive (yet) another *FLYING LESSON*?

Fuel mismanagement continues to contribute to a disappointing number of reported crashes. In the most recent *Joseph T. Nall Report*, a product of AOPA's Air Safety Institute, we learn that fuel-related crashes occurred 1.7 times a week in 2010. Although the number is down in recent years (perhaps as a result of widespread TAA use?) it is trending upward. And fuel mismanagement is still a sometimes deadly and almost-always-avoidable threat.

See:
www.aopa.org/asf
www.aopa.org/asf/publications/11nall.pdf



(left) Fuel management accidents, from AOPA's Nall Report

It's important to remember that "accidents" reported in the Nall Report are only those that result in NTSB-reportable death, serious injury, "substantial" aircraft damage or an "aircraft destroyed." The pilot who makes it to a runway after a fuel-related engine failure, or who puts the plane down in a field or on a road with no major damage, will not have his or her event reported to NTSB, nor be included in accident studies based on NTSB reports alone.

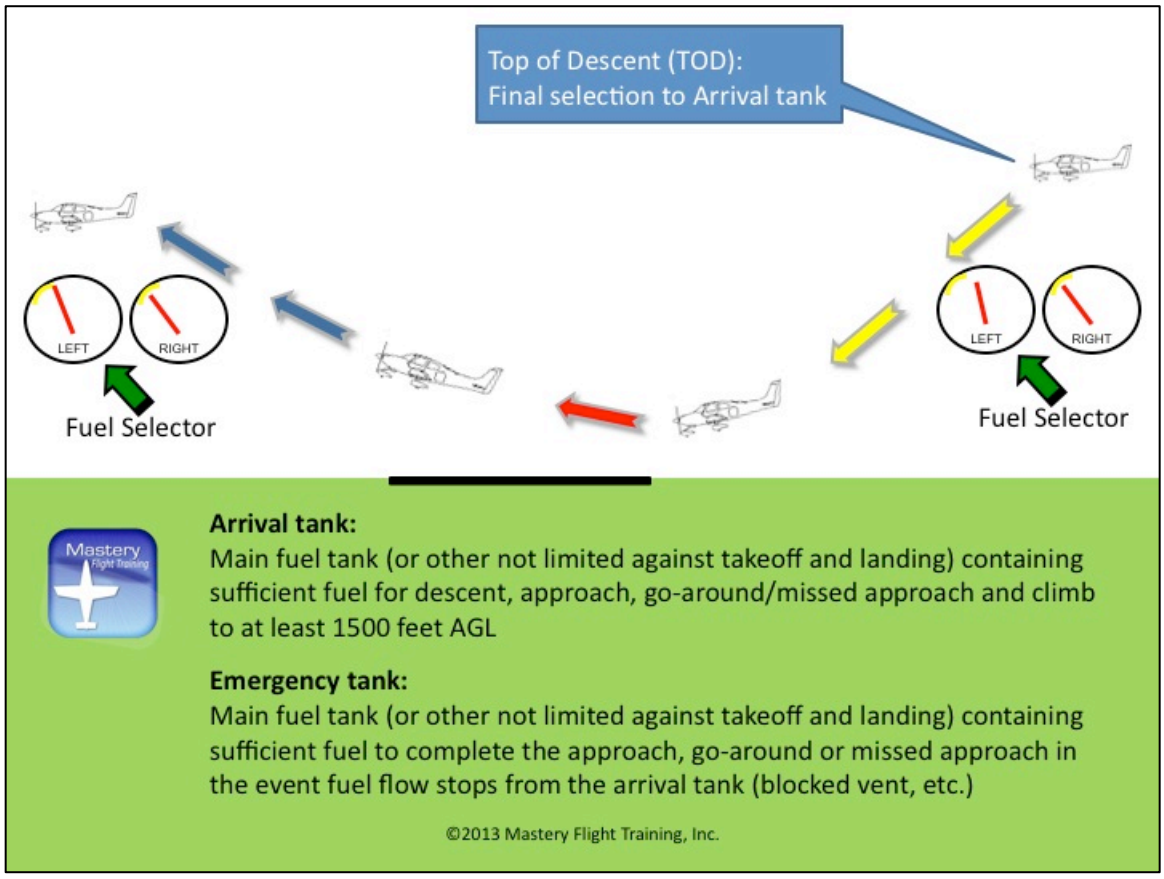
The less-detailed FAA preliminary reports suggest the actual number of fuel mishaps is greater, albeit with (fortunately) little injury or damage despite the potential for far worse. I suspect that even in the reduced-rate recent years, that general aviation

suffers two to three fuel-mishap crashes each week.

I've previously reported some preliminary research that reveals the majority of fuel starvation (running the selected fuel tank dry without getting a restart on a tank with fuel) and fuel exhaustion (running out of gas) events happen, like the Cirrus crash, within a very short distance of the intended destination that is usually the pilot's home airport. Why? I speculate that:

1. It's a hassle to refuel away from home, especially when you're not too far away.
2. Pilots generally want to avoid en route fuel stops.
3. Most pilots get a substantial "based airplane" fuel discount at the home airport, a powerful incentive to return with as little fuel as possible.

Some pilots espouse that flying the longest distance such that the airplane arrives with minimum reserve fuel remaining, all in a single fuel tank, is a great feat of "airmanship." I contend that it's greater airmanship to arrive with sufficient fuel remaining in the selected fuel tank to land *and* to miss the approach or go around and climb back to altitude if needed, with usable reserve of fuel remaining in another landing-approved fuel tank in the event a blocked fuel vent, an inaccurate fuel load or gauge indication, or other unforeseen situation makes the expected "arrival tank" fuel unusable.



If you feel planning your trips to have this much fuel remaining is wasteful, then I suggest that's the type of thinking that goes into two or three fuel-related crashes every week in the United States. Certainly all those pilots *thought* they had enough gas to make it, and the piloting skill to pull it off.

The freedom and independence of personal flight are such that there is scant documentation of the true conditions under which the emergency pilot performed his or her amazing feat. There is no "Miracle on the Hudson" for general aviation (coincidentally, a Piper

Cherokee Six "force landed" into the icy Hudson River near Yonkers, NY this week with no loss of life, but we have no details other than the airplane went down shortly after takeoff, and that the pilot and passenger had life preservers on board and used them).

See:
www.nbcnews.com/id/28678669/ns/us_news-life/t/ny-jet-crash-called-miracle-hudson/
www.faa.gov/data_research/accident_incident/preliminary_data/media/H_0129_N.txt

I've been in organizations that have given out awards to pilots for getting an engine restarted while descending over mountains in IMC, but only after the engine of the ice-prohibited airplane starved for air because of impact ice in actual icing conditions. I was in another group that awarded a pilot for landing after a mid-air collision—that occurred because he overtook and collided with an airplane that he was following "in trail" in a loose formation. I indeed do applaud pilots for skillful aviating with whatever capabilities are left after things go bad in flight. But I find it hard to give awards to pilots who "save" passengers and aircraft after deciding their way into an emergency that requires salvation by their "superior flying skills."

The lack of full documentation makes me squeamish about making traditional awards or proclamations. But I suppose there is a way to recognize the great pilots out there…

The First Mastery Flight Training Superior Airmanship Award winners are *all* pilots who plan their flights to arrive with sufficient fuel remaining in a landing-approved tank, to descend from cruise flight, complete approach and landing, miss the approach or go around if needed, and climb to a safe altitude…and *always* select that tank at Top-of-Descent, while keeping at least an emergency reserve in another landing-approved tank in the event of fuel flow interruption in the selected tank. The award-winning pilot will personally observe preflight fueling, track fuel state in flight by all means available, and readily divert and land to avoid violating the TOD fuel technique—even if that fuel stop is mere miles away from the intended destination.

Will your peers ever read accounts of your superior fuel-planning, award-winning airmanship in magazine or online news, or boasting on the Internet chat lines and bulletin boards? No. And that's the point.

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

Debrief: Readers write about recent *FLYING LESSONS:*

Regarding recent *LESSONS* about the pilot/controller interface during in-flight emergencies, reader Lorne Sheren writes:

> My original instrument instructor, many, many years ago, taught me to treat any order from ATC as a suggestion rather than a command. In other words, **evaluate what [controllers] want you to do and if it makes sense, go ahead and comply**. If you lose an engine head for the airport and ask them for help, but fly the airplane. Odds are the controller will go home after his shift no matter what the outcome; you may not be as fortunate. Same with a frequency change in a difficult time. **"Unable" works fine. They understand that**.

If when ATC was first created they had been called air traffic *coordinators* instead of *controllers,* perhaps pilots would have a better idea of the true relationship, especially in emergencies. I truly believe "controllers" do a great job of helping us fly safely, and that there is much they can do for us when things go bad. But we pilots need to remember that controllers are there to assist, not to tell us what to do—that decision is ours. Thanks, Lorne.

Frequent Debrief Woodie Diamond also adds to the *LESSONS* of the pilot/controller interface:

> Great issue of *FLYING LESSONS* this week! Both the main topic and the comments are actually related and deal with the same issue: **"Where am I?"** My comments are actually credit[ed] to continuous lessons learned from my flight instructor Rock Skowbo, who is a highly trained [and] experienced United Airlines pilot.
>
> Everyone knows that we must **"fly by the 8s"** at all times (Aviate, Navigate, Communicate). But what is often lacking is an absolute understanding of where we are and where we are going. When something goes wrong, and we must actually be a pilot, flying the 8s become a little more [involved] than pilots may think.
>
> **Aviate – Fly the airplane!** When I spent time at the United Air Lines pilot training center, I was amazed that during every training incident the very first thing that the crew established was *who was flying the airplane*. Not a second was spent identifying the problem, grabbing a checklist, or anything else. "I'm flying the airplane" was the very first thing that was said. **If you don't have positive control over the airplane, steering a course or telling someone about it is pointless**.
>
> **Navigate –** The fact is that **if we expect to start navigating when an emergency actually [occurs], it's already too late**. The "nearest" button on the GPS is worthless because it knows only distance, and nothing about the airplane, weather, terrain, or pilot. **If you have to push the "nearest" button, you're already headed for disaster.** My flight instructor loves to constantly ask me "where are you?" and "where are you going?" He always asks at the time he knows I'm busy doing other things. These questions have nothing to do with your actual geographical location, distance to next waypoint, elapsed flight time, or anything else in the normal flight regime. These questions deal with something terribly wrong at that particular moment.
>
> To fully answer these questions **you must know at all times the airports around you, weather conditions, terrain, and aircraft performance**. The weather at the airport you left from and the one you are going to are worthless because they are often 100s of miles behind or ahead of you. Must confess that I often get both questions wrong, even if I'm certain what the answers are. I am directly over an airport; that is where I'm going. Wrong; there's an airport 5 miles ahead, 5 degrees left with a runway parallel to my flight path, perfect weather and within easy distance of the airplane. The airport below me will require at least two turns and best guess where those turns need to occur. 10 minutes later I'm faced with a similar situation, only this time the airport five miles away has an unfavorable wind, short runway, bad runway alignment, and terrain.
>
> **Communicate –** If you have to ask someone outside the cockpit for help, then you have relinquished control over your own destiny. When it comes time to communicate, the decisions phase has pretty well lapsed. It's at this time you are advising ATC and everyone else "where you are" and "where you are going!" As my flight instructor likes to say, **declaring an emergency is only about taking ownership of the airspace and airport between where you are and where you are going**. It's most definitely *not* asking what you are supposed to do. There are so many excellent examples of this: the first one that comes to mind is the so called "Miracle on the Hudson." By the time the pilot contacted ATC, he had already established his course of action.
>
> I'll also suggest that our only knowledge and skill work should concentrate on nothing in the airplane working. If we are knowledgeable and skilled at handling and decision making with dead engines, having even partial thrust is an unexpected benefit.
>
> I must confess, practicing "emergency situational awareness" is by far the most difficult part of my flying. It requires continuous attention and is always lessened by every successful non-emergency flight. The more successful we are avoiding emergencies, the less time we spend in the cockpit concentrating on the plan.

Wise teachings from a wise instructor. You are fortunately to fly with Rock, Woodie. Thanks for letting us all learn from him.

Reader Karl F. responds to last week's report of the SR20 CAPS deployment that we revisited this week. Karl writes:

> I have been a Cirrus Training Specialist (CSIP) since 2006 and can tell you, with certainty, that the CAPS (Cirrus Parachute System) is not the panacea it is always made out to be. There are times when you might

> NOT want to deploy. The trained pilot must stay fully engaged in evaluation of the "Total Situation." During all…phases of the flight, keep thinking ahead, far ahead of the airplane.
>
> My point herein is "What Are The Meteorological Conditions On The Ground?" If you have 30- or 40-knot winds blowing, do you want to deploy? If you have a 40-knot headwind, your touch-down ground speed [in a traditional off-airport landing] should ideally be 20 knots. That is better than being dragged along [by the 'chute], out of control, at 40 knots. There are more such pertinent questions that should be asked. There are minimum altitude restrictions below which deployment is not suggested. The Cirrus accident records support the validity of this [sic] criteria. Strangely, many [pilots] who would be at an advantage deploying, [either] don't or wait to a point when it is really too late! The POH explains procedural limits.

True, Karl. Like all things aviation, the parachute system has advantages and limitations. The Cirrus Owners and Pilots Association (COPA) reports:

> The parachute deployment airspeed was demonstrated at V[parachute deployment] of 133 knots. The demonstrated loss of altitude was 400 feet from level flight and 920 feet from initiation of a 1-1/2 turn spin.

Within those parameters, COPA reports, "No person has died when the CAPS system deployed within demonstrated parameters," but this is not correct. COPA's list of CAPS deployments and their results include this account:

> **CAPS deployment #22, Feb 2010, Boulder, CO, 2 fatalities**; (not CAPS Save, parachute activated due to impact forces)Factors: mid-air collision between Cirrus SR20 and tow-plane with glider in tow; Activation: high altitude, 8,000 feet; Weather: VMC; Landing: level field

In reality the Cirrus parachute did deploy, but the airplane was consumed by fire during a descent that was widely viewed online and in new media. Perhaps the distinction is that the pilot did not actively cause the parachute to deploy.

Like any other safety device, as Karl notes the CAPS does not solve all problems. In the incident that started this conversation, it worked as advertised after all fuel was exhausted, and probably made the difference to save three lives.

See:
www.cirruspilots.org
www.cirruspilots.org/Content/CAPSHistory.aspx
www.rotaryforum.com/forum/showthread.php?t=24760

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

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2013 Great Lakes International Aviation Conference

Thank you to the *FLYING LESSONS* readers I saw last week at the Great Lakes International Aviation Conference in Ypsilanti, Michigan, and who my presentation "Magenta Line Thinking: The Promise and Pitfalls of Cockpit Technology."

See http://greatlakesaviationconference.com/

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
