FLYING LESSONS for September 27, 2012

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

FLYING LESSONS is an independent product of MASTERY FLIGHT TRAINING, INC. www.mastery-flight-training.com

This week's lessons:

I've had this reader request on my desktop far longer than I'd planned…

> Dear Tom:
>
> RE: Instrument Currency
>
> [Recently] I read an article concerning instrument flight currency, where the author called the FAR 61.57 c(1) a "joke", meaning that he thought the requirement(s) to fly ONLY 6 approaches (per the regulations) was insufficient for real proficiency, and judging by the overall tone of his article if left to him, would/should be far more draconian in nature.
>
> Why so harsh an opinion? How many accidents have occurred due to poor or those lacking instrument proficiency? Do not most IFR rated pilots, file an IFR flight plan, where you need to be "current" to file, under mostly VFR conditions; opting (hoping) for the "visual" at destination? After all there is a certain appeal/desire to being "guided" through controlled air space. So why belittle or decry the inexperienced instrument pilot?
>
> It could be conjecture but pilots (even commercial pilots) actually do less real flying and instead "monitor" systems. Given the sophisticated instrument array of some cockpits—G1000/5000 et al, concomitant with heads-up-displays, synthetic vision and autopilots, flying approaches has been reduced from a high work load, tediously "tracking" ADFs, DME arcs, or centering VOR needles (which way on the back course?) without any visual/pictorial (gps) references to one of a "video gamers" delight; bring "flying the approach" even closer to being of little difference between the practice simulator (on the ground) and actual conditions (in the air). Consider instead that the regulations as written seem more in line with today's technology then when they were originally written. So, how many approaches do I need to watch the autopilot fly to be current? Six?
>
> In my opinion, it would not be so much the number of approaches but how familiar/proficient are you with the on board instrumentation? Especially, when it fails or needs to be re-booted during the approach. And I am concerned that those nuances in needed training would not be addressed by more stringent, though well-intended, additional regulations. What you "tax" or over regulated you get less of, not all GA pilots are multi class—annually Simcom, FlightSafety rated, or full time corporate sponsored/ex-airline or ex-military pilots with enough experience/hours to be a snobbish aviateur. Rather they are enthusiastic week-end fliers with mainly poor go, no-go decision making criteria. Can't quite see them spending what limited time they already devote to "doing more approaches" just because its "required" rather, as they become non-current, they just give up flying entirely, which is NOT good for General Aviation. We already have a high rate of non-use private pilots, additionally required experience layers for the IFR rated could deter not encourage a robust GA market.
>
> Tom, comments please…thanks, Bryant

Sorry to be so long in responding, Bryant.

There are two ways to address your question. First, I'll answer from my experience as an instrument instructor in airplanes generally equipped with two- (or sometimes even three-) axis autopilots. Most do a superb job of flying coupled approaches.

They tend to have less success, however, hand-flying approaches. The most critical problems arise when an abnormal procedure drives a rapid transition from coupled to hand-flown conditions during an approach, especially if the abnormality takes the pilot from an everything-operating, autopilot coupled operation to hand-flown, partial panel conditions with little warning.

Given that experience, I recommend pilots maintain at least the minimum IFR currency in *each* operating mode: fully coupled approaches, raw data hand-flying, hand-flown flight director approaches (if the airplane is so equipped) and partial panel approaches.

I strive to "mix it up" like this for my own currency…two coupled, two hand-flown, two flight director, two partial panel. This means it takes six to eight actual or practice approaches every six months at a minimum (if I combine the partial panel practice with the hand-flown approaches).

It's also good to demand both glideslope-assisted and "step down" approaches of your IFR currency approaches.

There's also value, I believe, in flying practice approaches away from airports where you usually fly. Part of the workload of an IFR approach is interpreting the chart and tracking your progress through the procedure. If you fly your approaches-for-currency all at the home 'drome or your frequent destinations, familiarity prevents you experiencing the full workload.

Your observation that most IFR pilots are "fliers with mainly poor go, no-go decision making criteria," however, is entirely consistent with my general impression of the accident statistics. In other words, it appears that most IFR accidents are due to factors other than Loss of Control (LOC) and Controlled Flight into Terrain (CFIT), two accident categories indicative of poor physical flying skills in Instrument Meteorological Conditions (IMC)—inability to "fly on the gauges" in the first case, presumably without using an autopilot, and fixation with lack of attention to "the big picture" in the second. And how many times has *FLYING LESSONS* pointed out the pilot's decision-making as a prime contributor to aircraft mishaps?

The second way to address your request, then, is to look at the actual data. Below is a simplified tabulation of NTSB Probable Cause reports for 2010-2012, involving fixed-wing aircraft on Instrument Flight Plans in Instrument Meteorological Conditions:

Aircraft Type	Fatal	LOC	CFIT	Other	
PA32	1	1			Thunderstorm encounter
C421				1	Hard landing ice
SR20	1				
Be55				1	Fuel starvation
C182				1	Loss of directional control on landing
PA28				1	Fuel starvation
KA100		1			
Be23			1		
TBM850			1		
C210	1	1			
C310	1			1	Alcohol impaired pilot

EXP				1	Stall on takeoff
C310	1	1			
C310		1			
PA60				1	Runway overrun on landing
C172	1	1			
Be58	1	1			
PA28			1		
PA46	1	1			
M20	1	1			
M20	1	1			
C340				1	Stall on landing: ice
Be60	1		1		
C210			1		
Be36	1	1			
PA46	1		1		
G200				1	Runway overrun on landing
Be36	1	1			
Be36	1	1			
PA28				1	Carburetor icing
G-IV				1	Runway overrun on landing
C500				1	Runway overrun on landing
SR22		1			
C182	1		1		
C210	1	1			
C414			1		
PA28				1	Engine failure
PA46	1	1			
Be58	1	1			
PA28	1			1	Fuel exhaustion
PA46	1	1			
C310	1		1		
Be36	1	1			
601P	1	1			
PA24			1		
KA200			1		

MU2	1	1		
C177		1		
Totals	25	22	11	14
Aircraft Type	**Fatal**	**LOC**	**CFIT**	**Other**

Crunching the NTSB's numbers, of 49 reports:

- 22 events involved LOC (45% of the total)
- 11 events were CFIT (22%)
- The remaining 14 events resulted from other causes

Looking only at fatal mishaps, of 25 reports:

- 18 events involved LOC (72% of all fatals in IMC)
- 4 events were CFIT (16%)
- The remaining 2 events resulted from other causes

This is an extremely simplified view of accident causes in IMC. In most cases there were multiple circumstances that led to the final, "probable" cause. And as Bryant suggests, looking at the full reports usually reveals decision-making gone bad—for example, LOC or CFIT being preceded by flight into icing conditions in non-ice equipped aircraft, or flight into areas of known convective activity. In a few other cases, a LOC is known to have been preceded by an uncommanded autopilot disconnect.

In other words, a focus on autopilot operation and monitoring may indeed be a vital component to safe flight in IMC.

But the NTSB data show that LOC is the most common precursor to accidents in IMC, overwhelmingly so in fatal general aviation mishaps. History teaches us the *LESSON* that we indeed need to work more on basic flight by reference to instruments, especially when it is presented with little warning.

So is the FAA minimum standard of six approaches, navigation tracking and holding pattern entries enough to keep us safe in actual IMC? As long as the aircraft is equipped with an autopilot, the pilot is trained in and familiar with its operation, *and* the autopilot system works properly, the answer may be yes…except that doesn't prevent CFIT events.

But mishap history shows that we need to be ready to step in if automation isn't available, or if it fails. The LOC rate tells us "six approaches in six months" probably isn't enough.

Do you have to fly a lot more to log these approaches? Not if you have the option of flying an approach in IMC when you could take a contact approach or a visual, of if you can take a safety pilot along and log approaches under the hood on a trip you would have taken anyway.

U.S. rules for instrument currency are much less stringent than those in most of the rest of the world. We can pass the instrument rating Practical Test and never again fly with an instrument instructor as long as we right the correct numbers in our pilot logbook.

Among non-U.S. countries I'm most familiar with Canadian rules, which require instrument pilots to take a regular recertification checkride to retain IFR privileges. My experience as an instrument instructor is that my Canadian recurrent students have been uniformly very good IFR pilots…likely as a result of this stricter requirement, which most likely is common to nations flying under British Commonwealth-based aviation regulations.

Risk management at times boils down to a cost/benefits analysis—is the practice you need to be safe worth the cost of getting that practice? At least when flight in instrument conditions is concerned, the LOC/CFIT rate suggests that it is. Personal flying's never been inexpensive, and IFR flying requires even more of an ongoing investment.

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

Every little bit helps cover the expenses of keeping *FLYING LESSONS* online. **Please support *FLYING LESSONS* with your secure PayPal donation at www.mastery-flight-training.com.** Thank you, generous supporters!

Debrief: Readers write about recent *FLYING LESSONS:*

Reader Bill Stenson continues our discussion of multiengine V-speeds:

> I am a British MEP and SEP Instructor/Examiner with over 10000 hours under the belt. Can I say first of all that I find your *FLYING LESSONS Weekly* an invaluable read. I was introduced to it over a year ago by a fellow pilot and I occasionally email some of the copies to other GA pilots. I would just like to add my two cents to the topic raised in this weeks' issue about VMCA and more importantly VYSE.
>
> In the course of my flying career I have been tasked by maintenance organisations to test fly twin-engine aircraft prior to the reissue of the Certificate of Airworthiness. (This is no longer a requirement in the UK). I always flew with an observer, at MTOW [maximum takeoff weight], operating above 3000 AGL. My task was to explore inter alia the envelope for all variants of stalling, closing down and restarting engines sequentially, and testing the aircraft's performance at VYSE on a 5-minute climb. In other words, a bloody good shake down.
>
> I mostly flew GA7 Cougars, Seneca variants and Aztecs. The one thing I learned was that **while the POH said one thing the actuality was completely different. It all depended on the condition and age of the aircraft.** The book figures are based upon a brand new aircraft, tested by a company test pilot. Generally speaking the stalls fell within the POH figures but the VMCA and the VYSE was a different story. A brand new GA7 for example should achieve 125fpm at VYSE but the kit I was asked to test were well used training aircraft and if I was lucky I could get 50 to 75 fpm. Sometimes I could not achieve a climb at VYSE and the aircraft went down. I did learn that provided you knew the VMCA and the VYSE a climb could be achieved. So if you have an EFATO [engine failure at takeoff] and you can achieve a balance between the VMCA and the VYSE you will survive. When the engine fails you have little time to think of airflow over the wings, you just fly the plane.
>
> Keep up the good work.

Excellent observations, with data to back it up. Thank you, Bill.

Comments? Questions? *LESSONS* of your own? Send 'em in, to mastery.flight.training@cox.net.

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