FLYING LESSONS for February 9, 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.

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This week's lessons:

Like a surgeon

This appeared on a New Zealand-based website:

> The investigation of an accident involving a Yak 52 which went down near Feilding, New Zealand last month is focusing on a screwdriver found in the wreckage. Investigators are trying to determine if the tool could have jammed the controls of the Russian-built aircraft.
>
> Two doctors were fatally injured when the plane went down about 25 minutes after takeoff, according to several media sources including TVNZ. The CAA describes the screwdriver found in the wreckage as 'stubby'.
>
> The screwdriver is the focus of the investigation because a similar accident in a Yak 52 that occurred in the UK in 2003 was found to have been caused by a screwdriver which found its way to the tailcone and became jammed in the control mechanisms.
>
> TVNZ reports that the CAA has contacted all Yak 52 owners in the country advising them to carefully inspect their airplanes for any foreign objects that could become jammed in the controls before any further aerobatic flight.

Surgeons and other operating room staff will carefully locate and count all instruments, implements and equipment and make a complete count after the procedure is finished, down to the last sponge and suture. The goal is to account for everything that might have gone into the patient to assure nothing is left inside that isn't meant to remain behind.

Aircraft maintenance professionals should follow a similar practice and account for all tools, hardware and devices, down to the last washer and screw, to ensure nothing is left in the aircraft that might later bind controls, short out electrical connections or otherwise cause mayhem that can threaten the safety of flight. Aircraft owners must carefully inspect the airplane, especially after the airplane has been in for inspection or maintenance—the pilot-in-command is the last link in the quality control chain. After all, it's the mechanic's livelihood that's on the line, but it's your life, those of any passengers, and that of people beneath you on the ground. The type of airplane or the use to which it will be put (e.g., aerobatics) doesn't really matter—it pays to take some time to closely double-check the maintainer's work as a very interested partner in the airworthiness process.

The consequences of an im"prop"er start

Several times each year we hear about an airplane getting away from its pilot when he/she tries to start the engine by "hand-propping" the propeller. Last week we had another instance of severe injury—and this time, death—during an attempted hand-propping start. Most reviews of hand-propping accidents surround safe operating practices and the vital need to (1) secure the airplane, (2) have someone at the controls who knows how to control the airplane and stop the engine if needed after it starts, and (3) attempt the procedure only after receiving training on starting using the "Armstrong" method (where would one get that training any more? Perhaps your local EAA chapter?). But I don't recall anyone ever talking about the possible adverse consequences of a *successful* "propping" start, even if the airplane doesn't get away from you and nobody gets hurt. In the tradition of *FLYING LESSONS*, that will change, now.

See:

www.faa.gov/data_research/accident_incident/preliminary_data/media/B_0131_N.txt
www.eaa.org/chapters/

You should also consider why you (*think* you) have to prop the engine, and the possible consequences. For instance, if the battery's completely dead, in most cases it will not recharge once the engine's started. You have no backup electricity if the alternator or generator fails. You have nothing to protect avionics from transient power surges from your alternator/generator.

If the engine won't start because the starter has failed, one possible failure mode in engines with internal starter couplers leaves the starter partially engaged. This in turn can cause the starter drive to shear off when the engine runs, putting metal into the engine that can cause catastrophic engine failure at some inopportune time later.

A similar possibility exists in some types of engine if the battery is dead because the alternator (or generator) has failed and the battery did not recharge. Alternator failure can also put you in a condition where you have no electrics available (even reserve battery power) and no electrical spike protection. And engines with gear-driven alternators or generators may be susceptible to metal contamination if the coupling fails, too.

Paranoid? Perhaps. But the "need" to hand-prop an engine that is normally started with a starter is a *symptom* of some potentially bigger problem, not a failure mode unto itself. You need to treat the underlying problem. Can you safely hand-prop an engine? My point is, without some investigation into the reason, you simply don't know.

Better yet, don't hand-prop it at all if the airplane is equipped with a starter. If the engine has a starter as part of its design it is not airworthy without it per the TCDS. Instead, charge the battery if a dead battery is the problem, or have the starter, alternator or generator changed if the one of these accessories has failed.

Hand-propping is an art requiring training and practice. It's best suited to tailwheel airplanes with low-compression (usually low horsepower) engines because of the angle at which the propeller sits on the ground, and the internal suction you must overcome manually. I learned to hand-prop an airplane from an even-then-old, former World War II Navy primary instructor. Of course, he also taught me something else about flying—unless somebody is shooting at you, you do not *have* to fly NOW.

How to lower insurance rates and improve availability

A reader related this experience:

> My search for a [high-performance aircraft] ended when I found that I could not get an insurance company to cover me due to my age and lack of experience in high performance retractables. If good pilots cannot get insured, this is yet another way that [general aviation] will be limited in its future growth. I think insurance is a topic of important discussion. And I personally believe for it to be an effective discussion, it needs to go beyond [any one insurance agency].

Agreed. Of course, in most cases the individual insurance agent or broker has nothing to do with the decision.

The problem is that none of the insurance carriers will cover certain risks (the combination of pilots and airplane age/type) based on historic losses with similar risks. Occasionally one underwriter gets brave and takes on the historically riskier policies. Usually they get burnt and stop writing policies on that type of risk. That happened when I was an aviation insurance professional working in a major aircraft owners' association's program--at the time the company was a direct agency for a single insurance company. That company had very liberal underwriting guidelines and tried to cover just about any association member in any type of (certificated) airplane. They went broke on claims after a couple of years and we had to change to a carrier less willing to write what it saw as riskier policies.

If we'd all stop breaking airplanes through pilot error, and put the time (and money) into properly maintaining them so we don't have mechanical losses, then insurance would be a given and costs would be low. As it stands, it's not only expensive in many cases (although rates are down because reinsurance losses in air carrier operations have been almost nonexistent for a few

years), but frequently insurance is not available for certain risks at all, at any price. Insurance brokers simply get a "decline to quote" response when they take that pilot's application to the market. If no one will offer a quote the insurance agent is in the tough spot of telling the applicant he/she cannot get coverage.

Better availability of coverage all comes down to making insurance policies a good "bet" for insurance companies by significant, fleet-wide reduction in accidents and claims. That's part of why I stay up late nights writing about safety and decision-making—to help you be safer pilots (and improve my skills in the constant refresher process). We must all do our part to keep losses low or we risk not only our own safety and investment, but the entire future of personal aviation as well.

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

Debrief: Readers write about recent *FLYING LESSONS:*

Frequent Debriefer David Heberling writes about last week's *LESSONS* on task saturation and proper division of attention in the traffic pattern:

> Any light twin flying on a single engine is in an emergency situation. As such the pilot should not be hesitant to declare the emergency as soon as they can. In an emergency, you should never accept any clearance from ATC that puts the airplane in more danger than is already present. Other airplanes should be moved out of the way for you, not the other way around. Of course, if you are doing this as a training exercise, ATC should be notified of this fact. I still would not accept any kind of spacing maneuver other than extending the downwind to accommodate ATC in this situation. If ATC is insistent, then you would have to abandon the simulated engine failure. The key is to never do anything in training that is not consistent with what you would do in real engine failure situation.

Absolutely. Although last week's discussion of engine failures and a fatal stall while an airplane was complying with ATC's request for a spacing maneuver in the pattern who two separate events, David correctly reminds us that ATC's goal of traffic flow and conflict avoidance may not always coincide with our needs in the cockpit. In that event it's up to us to exercise command authority and advise controllers of our needs so they know how best to control traffic. Thanks, David.

I may have misunderstood reader Larry Olson's comments about my experience during my ATP checkride, when I was criticized by the examiner for not continuing the approach while identifying and securing a (simulated) failed engine. Larry follows up:

> I think you may have misinterpreted my comments a bit. My teaching of this method [quoted in a past Debrief]:
>
> > *If the glide slope is alive and you have any yaw problem (engine out, control problem), the first thing to do is control the plane... nothing else. If it's controllable just fly the approach. Gear down at the marker (or when appropriate, if one puts it down at GS intercept), keep controlling the plane with whatever inputs are needed, if rudder is needed, use rudder. If the plane starts to slow (perhaps it was an engine out), push BOTH throttles up a bit until the speed is what is desired. Do[n't] do anything else. No identify, verify, or feather. No checking for something else. Just fly the approach and land.*
> >
> > *Now, one does have to temper that approach a bit. First, in doing the above, one is making a commitment to land, no going around. So if the weather is below min[imum]s, abandon the*

> *approach and go elsewhere. Second, if there's any doubt at making a commitment to land, make the final choice no lower that 500 ft (pick the number that works for you).*
>
> *Also, if you just did something, like add flaps (which you shouldn't be doing in that position anyway), sure, undo them, or look at them to see if they are asymmetric.*

> …is because it maintains a stable situation. Far different than raising the gear, identifying, verifying, feathering and going thru an engine out checklist. One isn't really "stable" until the completion of the litany, configuring for single engine ops and being on speed and on profile (level, in this case).
>
> My method is dirt simple and that's why I'd teach it to a beginner. The only decision one has to make, is to make a commitment to land. There are no configuration, speed or trim changes, only to maintain what one already has.

Thanks for the follow-up, Larry.

Readers, tell us what you think…at mastery.flight.training@cox.net.

Share safer skies. Forward *FLYING LESSONS* to a friend.

Flying has risks. Choose wisely.

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2010 National FAA Safety Team Representative of the Year
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