EXPLORING THE RIDDLE OF LIGHT AVIATION'S FUTURE

Plane & Pilot®

MIXED REALITY
The Next Phase in Sim Technology

Illusions:
A SOMATOGRAVIC CRASH

NEW CIRRUS ON THE WAY?

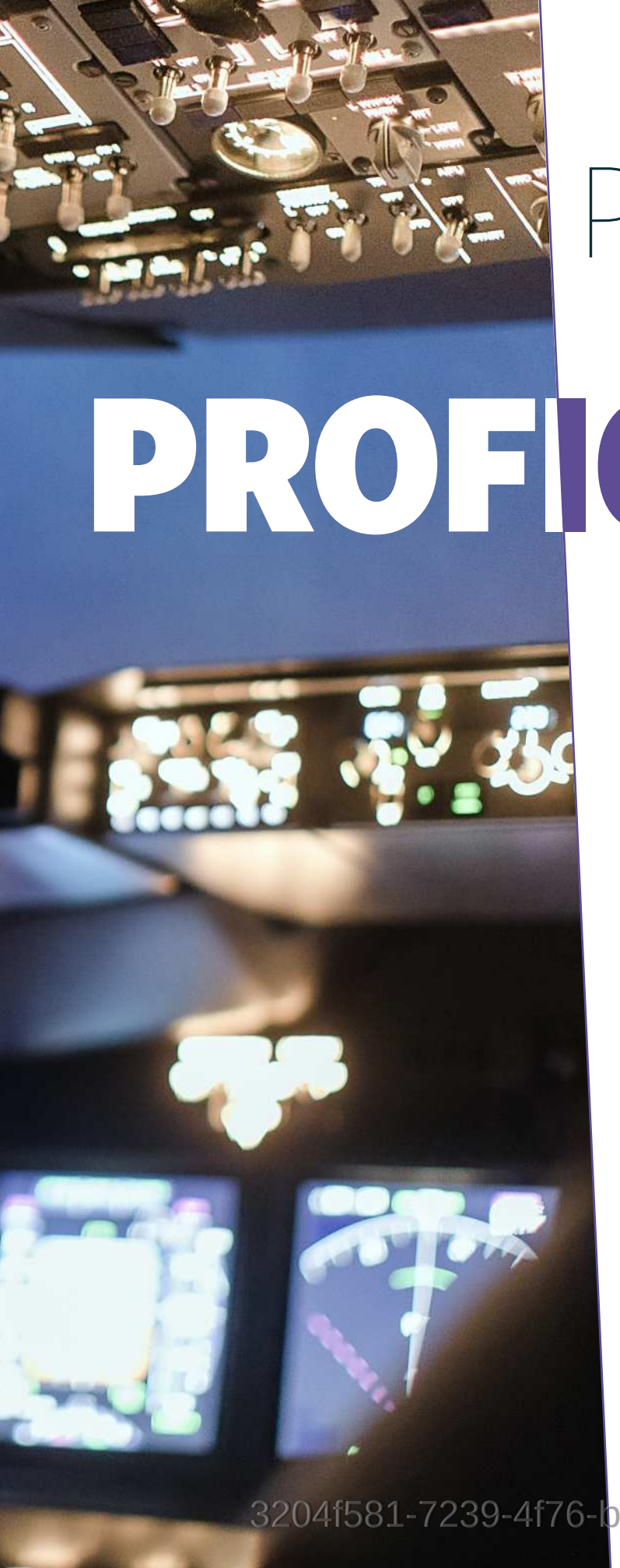
The Future Arrives at OSHKOSH

inside

October 2022 VOL. 58 NO. 9

VISIT THE PLANE & PILOT® WEBSITE AT PLANEANDPILOTMAG.COM

3204f581-7239-4f76-bd56-93e0fa98e4fd



PRACTICE MAKES PROFICIENT

The lessons light plane flyers can take away from airline safety practices

BY ELLIOTT COX

Between 2009 and 2018 in the United States, part 121 airline carriers had an accident every 628.9K hours flown with 11 fatalities. Part 135 charter operations had an accident every 125.9K hours flown with 45 fatalities. Part 91 general aviation had an accident every 1.87K hours flown with 13,297 fatalities. Why is there such a steep spike in the accident rate of general aviation?

One of the biggest differences I've seen between flying professionally and non-professionally is the frequency and quality of training. Part 135 charter operations and Part 121 air carriers typically require their pilots to attend recurrent training every six months, with a check ride at the end of each training event. To maintain PIC currency in Part 91, you only need a flight review every 24 months, unless you're operating an airplane that requires two crew members or is turbine powered. In that case, you'll need a 61.58 proficiency check every 12 months. But it isn't just the frequency of training that helps to keep the accident rate low among the carriers; it's the quality of the training.

When I go to recurrent training every six months, we have two days of ground instruction followed by practical training in a simulator. We review airplane

systems and limitations and discuss recent accidents and incidents to learn what we can about each case. After ground school, we get to play in an awesome 3D video game...I mean, we get to participate in three days of high-quality training in a level-D simulator for a total of 12 hours "in the box." We swap seats every two hours, so each crew member gets equal time in pilot monitoring and pilot flying roles.

Much like it is in ground school, a lot of what we do in the sim is scenario-based and comes from accidents or incidents. We have engine and compartment fires, we lose engines at the worst time on the takeoff roll, and we sometimes lose all of our hydraulic fluid so that we have minimal flight control authority. So, you know, just a run-of-the-mill Tuesday morning.

What makes sim training so valuable is that if we ever see any issues in the real world, it'll be less of an emergency than just another set of procedures that we as a crew have to work through. Even if what we encounter in the real world isn't something we've specifically trained on, working through so many emergencies in training prepares our brains to accept that things can and do happen, and there's a way to deal with whatever comes our way. Training in the sim makes emergencies seem like a real possibility, not just an abstract, bulleted list in the airplane pilot's operating handbook (POH).

Over the past few years, I've probably had 25 engine fires in the sim. I hope it never happens in real life, but if I ever do get an engine fire in the airplane, I won't have to think about what to do because I've seen it all before. That procedure has been drilled into my head, as well as my muscle memory, so it becomes a procedure, not an emergency.

You don't have to have a fancy simulator to train like the jet jockeys train. No matter what you fly, you can hire an instructor to put you through some emergencies, or, if the timing lines up, work with an instructor to turn your flight review into something more than a signature in your logbook. A flight review is a good opportunity to work with an instructor to knock the rust off of any skills you haven't used in a while, but they're typically not more intensive than just a few maneuvers that you've been doing since your student pilot days.

When your next flight review is due, let your instructor know that you'd like to work through some emergencies and abnormals instead of steep turns and chandelles—they'll probably appreciate the break in the monotony. They probably won't pull the mixture at 50 feet just to see if you can make it over the river and through the cornfield, but CFIs are a curious bunch. They may call "simulated engine out" at 50 feet and ask you to talk and mimic through what you'd do if that emergency was actually inflicted on you, but they'd probably prefer that their side of the airplane not get crunched up in a field and turned into beer cans. Although the emergencies are simulated, it's important to touch the controls you'll be moving during each emergency because the tactile element of feeling the knob or switch or fuel selector will help burn that procedure into your brain. As Maria Montessori said, "What the hand does, the mind remembers."

A less-expensive option than hiring an instructor to torture you all day, although some CFIs I know love teaching for their own entertainment, is to do some chair flying on your own time. Go through your POH or airplane flight manual (AFM), refamiliarize yourself with the abnormal and emergency procedures, then chair fly them. Don't sell yourself short, either. Set aside a block of time in a quiet place, close your eyes, and work your way through the procedures in your airplane's manual. Chair flying helps you memorize the procedure and gets you started on burning the muscle memory into your brain. It isn't quite as effective as actually performing the procedure, but chair flying primes your brain to know what to do when your engine starts shooting metal out at you. A piston rod sticking out of your engine cowling is not the most opportune time to pull out the 'ole POH and see what Clyde thought you should do to get his 172 back on the ground safely.

What the carriers and charters use to combat indecision and startle factor are checklists and briefings. The pros use a briefing before each phase of flight to take the decision-making process away

in case something happens. Briefings take away the "this can't be happening" factor because you know that if an engine fails before a certain speed, you'll abort the takeoff. If you have a failure beyond that speed, you'll take the problem into the air and deal with it once you're stabilized. By briefing what you're going to do, you're acknowledging that something bad can happen, and you have a plan.

Checklists and briefings ensure each crew member performs each task the same way every time. You can take any two pilots from any airline, put them in a cockpit together, and they'll function as smoothly as a King Air crew who have been flying together for 10 years. Each pilot is trained exactly like every other pilot, so they all do things the same way, keeping procedures in the cockpit standard across the board. Crews do the same thing the same way every time, which makes any anomaly stand out like the proverbial sore thumb.

The airlines and charter companies also put a lot of thought into the dispatch decision. Weather and NOTAMs, weight and balance, and maintenance logs are just a few things that have to

be in order before closing the passenger door. What they have that GA doesn't is an entire dispatch department. Luckily for you, you don't have quite as many boxes to check to make your own go/no-go decision.

If you own an airplane, you're intimately knowledgeable about its maintenance status and history, but if you rent airplanes from a school or a club, you may have to dig a little to find all the logbooks to form a complete picture of an airplane's status. Maintenance history, current discrepancies, AD compliance and upcoming maintenance are all things that a pilot should be up to date on before deciding on whether or not to go flying. Not all clubs or schools make it easy to get access to maintenance documents, and maintenance is often a grossly overlooked subject in primary and advanced training. If you feel like you don't have a good grasp on the maintenance piece of the puzzle, spend some time with someone who does. If you ask a few of your flying friends for recommendations, you're sure to find a local CFI or an A&P/IA who would be happy to give you some pointers and let you know that nearly everything you'd ever want to know is in AC 43.13-1b. Maintenance is one of the least-understood aspects of general aviation, but it doesn't have to be.

> "A less-expensive option than hiring an instructor to torture you all day, although some CFIs I know love teaching for their own entertainment, is to do some chair flying on your own time."

Along with your maintenance briefing, make weather and performance briefings part of your preflight routine. Digital EFBs like ForeFlight and Garmin Pilot are available today for not a lot of money, so getting killed by weather is nearly optional. It's true that some weather events can sneak up and completely blindside you, but the vast majority of it has been heading your way for several days. You can also run very detailed weight and balance reports and precise performance calculations in these EFBs. All it takes is a little bit of time to set up profiles for the airplanes you fly, and you can create dispatch reports that rival what the pros use within a few minutes.

There are quite a few things that the GA community can learn from the pros that will reduce the risk in GA flying, and most of them are inexpensive and easy to implement into our daily flying. There's risk in everything, but as a group of people who willingly coax wings full of 1930s-era gas, powered by 1940s-era tractor ignition systems, into the air, we should mirror the pace of GA innovation and slow our willingness to take undetected problems into the air. The only surefire way to bring the GA accident rate down to almost zero is to drain all that dangerous fuel out of all these airplanes and never take them into the sky again, but where's the fun in that? But we *can* surely trim off some of the risk and, consequently, give the NTSB investigators a few more days off a year by training smarter and flying with eyes wide open. **PP**