

— LATEST BRIEFING —

In Pursuit of the Gold Standard

by Charlie Precourt, CJP Safety Committee Chairman

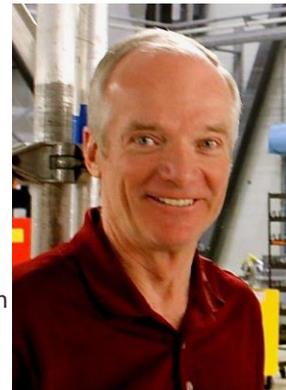
It should come as no surprise that the most-read articles in any aviation publication deal with accidents and incidents. We reflect as pilots on every event and wonder what we would have done in the same situation. And, when we know someone involved in a fatality, it hits us hard.

The bottom line is, we all want to become more competent and safer pilots. Our passengers, and more importantly our families, deserve it. But oftentimes, we don't do everything we can to attain that goal. We don't "go the extra mile."

The military, airlines and corporate aviation have attained remarkable safety records through rigorous training and standards. In their world, every flight they perform is critiqued in detail, always in pursuit of their Gold Standard. And no matter how many hours you have logged, we all know a pilot or two that we admire for their dedication to professionalism and quest for self-improvement. Why can't we be like them?

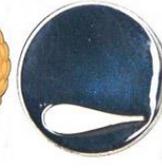
The answer is, we can. We just need a good plan.

To that end, the Citation Jet Pilots Association is pleased to introduce the CJP Gold Standard Safety Award, to tap into the competitive spirit of our members to pursue ever-improving performance in our day to day flying. The cornerstone of this award is based on successful completion of annual simulator based training, participation in advanced airmanship courses,



and adhering to the standard operating practices developed by our industry.

In the June issue of AOPA magazine, Barry Schiff wrote about “Broken Wings,” a critique of the FAA Wings program - less than 10% of all pilots have ever completed the basic level of Wings. In short, the program is poorly promoted and does not provide the kind of motivation for pilots to stay engaged. Barry pointed out that it’s hard to cherish an award that involves taking flight instruction and attending a seminar. He pointed to the Soaring Society of America (SSA) program as a better model, because it awards genuine accomplishments. Flying 1,000 kilometers in a glider or climbing above 25,000 feet for example. I can personally relate to his critique... I earned SSA’s “Lennie” pin for climbing above 32,000 feet and found that to be far more motivating than the Wings program.



In our world of Citation flying, there are several things we can pursue that would be equally motivational and improve our overall safety. I’ve outlined some options below to give you an idea of the things your Safety Committee has considered to date, but we need input from you, our members, on how best to structure the criteria for the CJP Gold Standard Safety Award in time to present the initial awards at the 2017 CJP Convention in Phoenix. We trust this will become the most coveted award in the CJP community, and a significant benefit to your membership.

Your CJP Safety Committee has looked at many overall considerations for establishing the award, including the possibility that insurance companies may ultimately recognize the award for premium reductions. Another important metric is that 20% of our members fly Citations that have been modified to unique configurations not delivered when new by the OEM, requiring us to tailor some of the safety training to those aircraft conditions.

Further, we all acknowledge that our 61.58 training dictates several requirements that are not value-added. We might be able to work with the FAA and our simulator vendors to improve that over time; until then, we should strive to ensure any training connected to our Gold Standard Safety Award is indeed high value-added. We also see a need for a combination of simulator and in-flight training to ensure a well-rounded program.



One of the principles we explored for the award includes a short list of one-time training events, and an accompanying list of recurring training to achieve the CJP Gold Standard Safety Award. This would enable members to receive the award in consecutive years by continuing to meet the recurring requirements, and from that we would envision a Gold Plus Award for achieving several consecutive years at the Gold level.

Among the one-time events, we could include specialized upset and stall/spin training. Our President, Kirk Samuelson, just completed the program offered by Flight Research Inc. at Mojave, with my former astronaut colleague Billy Oefelein as his instructor. They use a Sabreliner and an Aermacchi Impala to teach upset recoveries, stalls and spins in great detail, and then they will take you in your Citation and perform upset and stall training (no, not spins), leveraging the lessons from their curriculum aircraft. Judging from the smile on Kirk’s face, he thought this was well worthwhile. I personally view this training to be invaluable. If you



take your Citation desk model right now, hold it in a 10-degree nose low descent, and then roll it 180 degrees, you will be in an inverted upset situation that is not far-fetched. Picture yourself in the cockpit, seeing nothing but ground. In 90% of the cases I have presented that situation to a first-time pilot trainee, their instinct is to pull, in the pitch axis, straight down through the vertical, and come out in a high-speed dive on the other side...rather than simply rolling the aircraft back upright. This reaction is due to losing sight of the horizon when inverted, and seeing all that ground. The training teaches you how to address that and make the first move the correct move.



For recurring events, one concept involves planning two simulator sessions per year, or one simulator and one aircraft special training event. The first of these could be the annual 61.58 check (in the aircraft or sim) and the second could be a tailored scenario-based event created by members of the Safety Committee to provide a challenging flight profile. For example, this could be a “round robin” flight to multiple airports in relatively close proximity, flown with a mentor pilot as observer, to exercise your ability to sequence through multiple departures and approaches, as might occur in a real-world weather divert. Completion of the entire profile within our CJP expected standards would achieve the credits toward the Gold Standard Award.

Given recent hypoxia incidents, we also considered an altitude chamber training event that could be part of the one-time requirement for the Award. Typically, these involve both a rapid decompression event (usually from 8,000 to 18,000 feet), and a hypoxia awareness event at 25,000 feet with up to 4 minutes



exposure without oxygen to gauge personal symptoms and ability to recover with the mask. A good NASA friend of mine, Terry Pappas, had a very serious hypoxia incident early in his SR-71 training and was lucky to live to tell about it...read about his experience near the end of the linked article on chamber training found at http://www.wvi.com/~sr71webmaster/Alt_Chamber.htm It gives a pretty compelling reason to consider this training!

We follow up below with a perspective from Bob Wright on single pilot jet operations, and then Rob Finfrock interviews several of our members about going that “extra mile” by taking advantage of supplemental training opportunities. Please provide us your thoughts about how to make this a truly meaningful award for our membership. Send to safety@citationjetpilots.com

Fly Safe

Charlie

Lonely at the top? Help is available

Single-pilot operation of high performance aircraft is no cakewalk, especially in a jet.

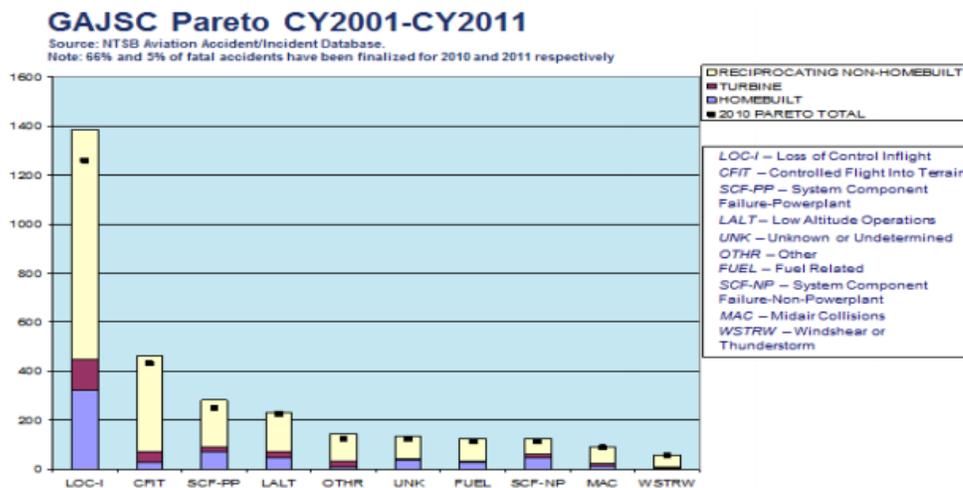
Citation pilots can feel justifiably proud of the generally excellent safety record they have achieved with their aircraft. Forty-five years of operation for the Citation series, in its many evolution's, confirms these results. This record generally applies to single-pilot operations, as well; however, some recent accidents have revealed gaps in single-pilot safety that suggest we need to look at accident causes in a different way. The National Business Aviation Association (NBAA) Safety Committee has made single-pilot safety one of its top priorities,

and its Single-Pilot Work Group (SPWG) is working hard to offer new and revised tools that can help you operate your Citation with greater safety and efficiency.

Seeking root causes for accidents

In the last several years, the Federal Aviation Administration (FAA) has worked with its industry partners to address leading general aviation accident causes. These entities have come together in the General Aviation Joint Steering Committee (GAJSC) to conduct this analysis and devise safety enhancements to mitigate accident causes.

The GAJSC has studied many factors that play a role in general aviation fatal accidents. They created a Safety Analysis Team (SAT) to conduct in-depth analysis of individual accidents. The SAT formed work groups to address leading accident causes and devise mitigation's to reduce such accidents in the future. One of the areas they studied was loss of control in-flight (LOC-I), billed as the leading cause of GA fatal accidents. The Pareto chart below illustrates this.



It should be noted that accident cause labels such as LOC-I often describe the final event in the accident chain. They do not necessarily reveal the true root cause of an accident.

The root causes of several single-pilot jet accidents occurring in the last several years indicate that there may be a deficiency in certain critical skills needed to operate these aircraft safely as a single pilot. Although three of the following four fatal accidents are single-pilot Citations, this reflects their preponderance in the single-pilot jet fleet.

- In February 2008, a Cessna 525 crashed just after takeoff in night IMC conditions in West Gardiner, Maine. The pilot reported an attitude indicator failure. She had rushed through the takeoff on a contaminated runway. Regarding root causes, the facts of this accident suggest poor risk management, automation management, and task and workload management, as well as a loss of situational awareness (SA), resulting in a loss of control.

- In December 2014, an Embraer Phenom 100 crashed while on final approach to the Gaithersburg, Maryland airport in VMC conditions. The aircraft had been in icing conditions, but the pilot elected not to activate the de-icing system, probably recognizing the increased approach speed this action would require as he approached the 4,200-foot runway at GAI. As a result, the aircraft stalled just short of the runway, killing the pilot and two passengers, as well as a woman and her two small children on the ground. The NTSB final report suggested training and checking deficiencies. The facts of the accident suggest poor risk management, task and workload overload, and loss of SA.

- In January 2016, a Cessna 525 crashed while in cruise flight near Cedar Fork, Utah. The pilot declared a MAYDAY, reporting a flight management system (FMS) failure and problems with the backup FMS. While hand flying, the pilot apparently lost control of the aircraft. The facts suggest poor automation management, ineffective task and work load management, and loss of SA.

- In December 2016, a Cessna 525 piloted by a single-pilot and carrying five passengers crashed into Lake Erie shortly after departing from Cleveland, Ohio. Night VMC conditions prevailed, although the aircraft was on an IFR flight plan. Although the pilot apparently lost control of the aircraft, this accident is still under investigation and there are insufficient facts to determine a root cause at the time this article was written.

The key skill sets

These fatal, single-pilot jet accidents all suggest that the pilots may have had insufficient single-pilot resource management (SRM) skills for the conditions experienced on those flights. SRM skills are essential for safe single-pilot operation in any aircraft and especially so in turbine-powered aircraft. These SRM elements include the following skill sets:

- Risk management - This important skill is now included in the new Airman Certification Standards (ACS) documents that are being implemented for all pilot certificates and ratings. The ATP and Type Rating ACS will likely be issued in early 2018. At that point, all applicants for single-pilot jet type ratings will have to demonstrate the ability to identify, assess, and mitigate risk for all tasks and objectives on the practical test. They will also need to demonstrate these skills during their annual proficiency checks.
- Automation management - On any jet, it is impossible to safely operate the aircraft without absolute proficiency in using the autopilot, FMS, and other automated systems. This is especially so for single-pilot operations. Automation proficiency includes knowing when not to use the automation and proficiency in manual flying without any automation.
- Task and workload management - Flying any jet means complying with all procedures, managing workload for each phase of flight, managing more complex systems, and keeping ahead of an airplane traveling at twice the speed of the fastest small piston-engine aircraft. Again, this is especially so for single-pilot aircraft.
- Maintaining situation awareness (SA) - Having good SA is a skill that should be learned early in one's flying career, but it is essential to single-pilot operation of a jet. The ability to be aware of weather, terrain, airspace, traffic, and aircraft system performance and configuration is needed to operate under all flight conditions.

NBAA focus on single-pilot safety and tools

NBAA recognizes the importance of single-pilot safety to the entire business aviation community; indeed, a large proportion of NBAA's membership consists of single-pilot operators of light business aircraft (LBA). For the last several years, NBAA has also hosted a "Single-Pilot Safety Stand Down" in conjunction with its annual Convention.

The NBAA SPWG has developed tools to help single-pilot operators conduct safer operations. Some of these tools are available to all pilots, while others are only available to NBAA members. Here's a sampling of those tools that are available on the "Single-Pilot Operations" page of the NBAA web site (<https://www.nbaa.org/ops/safety/single-pilot/>). The Risk Management Guide and the "Alone in the Cockpit" video were developed specifically for single-pilot operation. The Training Guidelines and Operations Manual Template were developed for all LBA operators. Soon, the SPWG will review these documents and, if necessary, revise them to include single-pilot operations.

Crafting your own safety enhancement program

As members of CJP, you have already demonstrated your initiative and interest in safer operations. Don't hesitate to craft your own program to improve your operation. Consider these suggestions:

- Take an online Single-Pilot Resource Management Course (consider the one available at www.trainingport.net).
 - Practice risk management in all your flight operations and consider using the flight risk assessment tool (FRAT) in the NBAA Risk Management Guide.
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Robert Wright is President of Wright Aviation Solutions LLC and a former FAA executive. He holds an ATP with four jet type ratings, including the Cessna Citation 500 and Eclipse 500 (single-pilot). He has more than 9700 flight hours in more than 100 types of aircraft and has been flying since 1964.

Going Beyond FAA Requirements: Simulators Offer Valuable Supplemental Training Opportunities

By Rob Finfrock

From the very first single-pilot Citation 501 through to the latest CJ3+ and M2, Cessna has designed its line of single-pilot jets to be as simple to operate as possible within the limitations of available technology. This philosophy has resulted in highly-advanced aircraft flight decks that greatly ease the workload for a lone operator in the left seat under normal operating conditions.

Despite these advances, accident rates remain a significant concern among the single-pilot/owner-flown aircraft segment. According to figures cited by the National

Business Aviation Association (NBAA) Safety Committee, single-pilot operators of piston, turboprop, and jet aircraft are 30% more likely to be involved in an accident than a dual-pilot crew. That may be attributed to several distinct challenges, including greater potential for distractions and stress to affect a single pilot's performance at the controls.



CJP Director Joe Fisher, whose flying career includes time with Part 135 operations such as NetJets, pointed to the disparity between accident rates for professional flight crews and owner/pilots. "They have two type-rated captains in the airplane, who each undergo recurrent training every six months," he said. "I'm just one guy, and with distractions and task saturation, the workload for one guy at the controls is a lot higher than half the workload for two."

While there have been varied suggestions on ways to improve single pilot training, it's generally agreed that pilots must go beyond the rote FAA training requirements, and take supplemental training on how to respond to abnormal operations, and full-blown emergencies. One of the most effective methods is through utilizing flight simulators and flight training devices (FTDs) to safely recreate these conditions in an instructional environment.

Simulators Help Train Pilots to Respond to Abnormal Situations

Many professional training operations have adjusted their offerings to address the unique challenges confronting single pilots. For example, CJP Platinum Partner TRU Simulation + Training's "Current 365" program allows operators to perform two recurrent training events within a 13-month window.

Subscribers also have yearly access to the FAA approved online ground school training modules to refresh their knowledge on aircraft systems and procedures, and can have aircraft questions emailed directly to them at customizable frequencies to keep current year-round. In addition, they have unlimited use of Integra FTDs at the training centers.

"In the middle, we can plug in a few things along the way to customize the experience," explained David Hayes, Director of Sales at TRU Simulation + Training. "We're the only training provider with an FAA approved online ground school for the CJ3 and CJ4, and we aim to have approval for the CJ3+ and M2 later this year."



Several CJP Members also utilize the Full Service agreement offered by CJP Platinum Partner FlightSafety International (FSI). Billed as "essentially a continuous [training] subscription," the program allows pilots to lock in their training costs for a minimum of two years, while also providing multiple recurrent training sessions in FSI's full-motion simulators for no extra charge on up to two aircraft.

CJP Founder and Member Stuart Fred is among those utilizing the FSI program. "In addition to 61.58 and 61.56 (flight review) sessions, I also drop in when I can in Wichita or Orlando, and each time I try to think 'out of the box,'" Fred explained. "[The instructor and I] attempt to simulate situations I've either heard, or read, about in these airplanes. That includes creating a training event simulating a recent accident or incident, to see what that pilot experienced and determine the proper way to deal with the incident.

"Why train to the syllabus if I've already met that obligation?" he continued. "I want them to throw as much as they can at me - hydraulic, engine, and electrical failures, to name a few - until I reach the breaking point, so I may learn to prioritize emergency conditions over abnormalities."

At a recent training session, CJP Founder John Hayes was paired with a partner who'd never been a sim before. "I think he showed up a bit skeptical," Hayes recalled, "but he left with his eyes opened.

"Sim training is the best kind of training you can get for flying a turbine aircraft," Hayes continued. "You can do so many things in the sim that you absolutely cannot do safely in the airplane, and that is a huge value."

While subscription-based programs offer savings over purchasing separate training sessions, some pilots may still balk at the high costs. "I just don't understand the cost argument," said CJP Director and founding member David Miller. "We get in these airplanes that can easily cause us harm. It's not fair to me, my family, or my passengers to not have the most knowledge and experience possible to ensure their safety."

Fisher also acknowledged the time commitment involved. "My time is important to me, but you have to prioritize that," he continued. "It's another 3-4 days a year, but I feel it's extremely important to take that time. With the full-service program, I can go [for training] whenever I want, and it may save the people I love.

"Flying a single-pilot jet is a double-edged sword," he added. "I love getting into my jet whenever I want, to go wherever I want. The danger lies in being able to do that without the experience necessary to do it safely - you need to be prepared when something goes wrong, and full-motion sims are vital for learning to handle what can happen."

"Every Time I'm in an Airplane is a Training Event"

While simulators provide invaluable training opportunities, CJP encourages all pilots to utilize a variety of resources available.



"Every time I'm in an airplane is a training event," Fred stated. "I was fortunate enough to train with guys who became flight instructors as a passion to teach or after flying in the military and airlines, and one of the most important lessons they taught me was: if there's ever any doubt, there's no doubt. Stop, analyze what you're doing, and do not move an inch further until you've removed the doubt."

Miller also encouraged pilots to employ a mentor pilot when transitioning to a new airplane; in fact, he recently insisted on a mentor when taking delivery of his second Citation Mustang, despite his extensive time in the type.

"It's not a requirement, but it just makes sense to have someone respected and knowledgeable in the airplane for the first few hours that you're most vulnerable," he explained. "I also fly with a mentor when traveling to an unfamiliar area, or in conditions like high density traffic. Having someone there who knows the ropes can greatly reduce the stress factor, and ease my concerns."

In addition to simulator training, Hayes also recommended in-aircraft upset prevention and recovery training (UPRT.) "Learning to control an airplane upside-down can save your bacon, and develops muscle memory that can help inform your decision-making when in an actual emergency," he noted.

When pilots question the need to take additional or supplemental training, Fisher emphasized they should consider the potential ramifications from lack of preparation to handle with emergency situations.

"Our passengers - our families - fly with us under the expectation they'll arrive home safe and sound," he concluded. "If you don't receive the right training, the people you may kill will be the people you love."

Rob Finrock is a freelance aviation writer whose work has appeared in Flying, Aviation International News, and other publications. He writes and edits CJP's Flight Levels bimonthly newsletter.

Citation Jet Pilots is the world's premier Cessna Citation aircraft owner-pilot organization. If you are a Citation owner-pilot who wants to operate your aircraft more safely, professionally, and economically, this is the place to be.