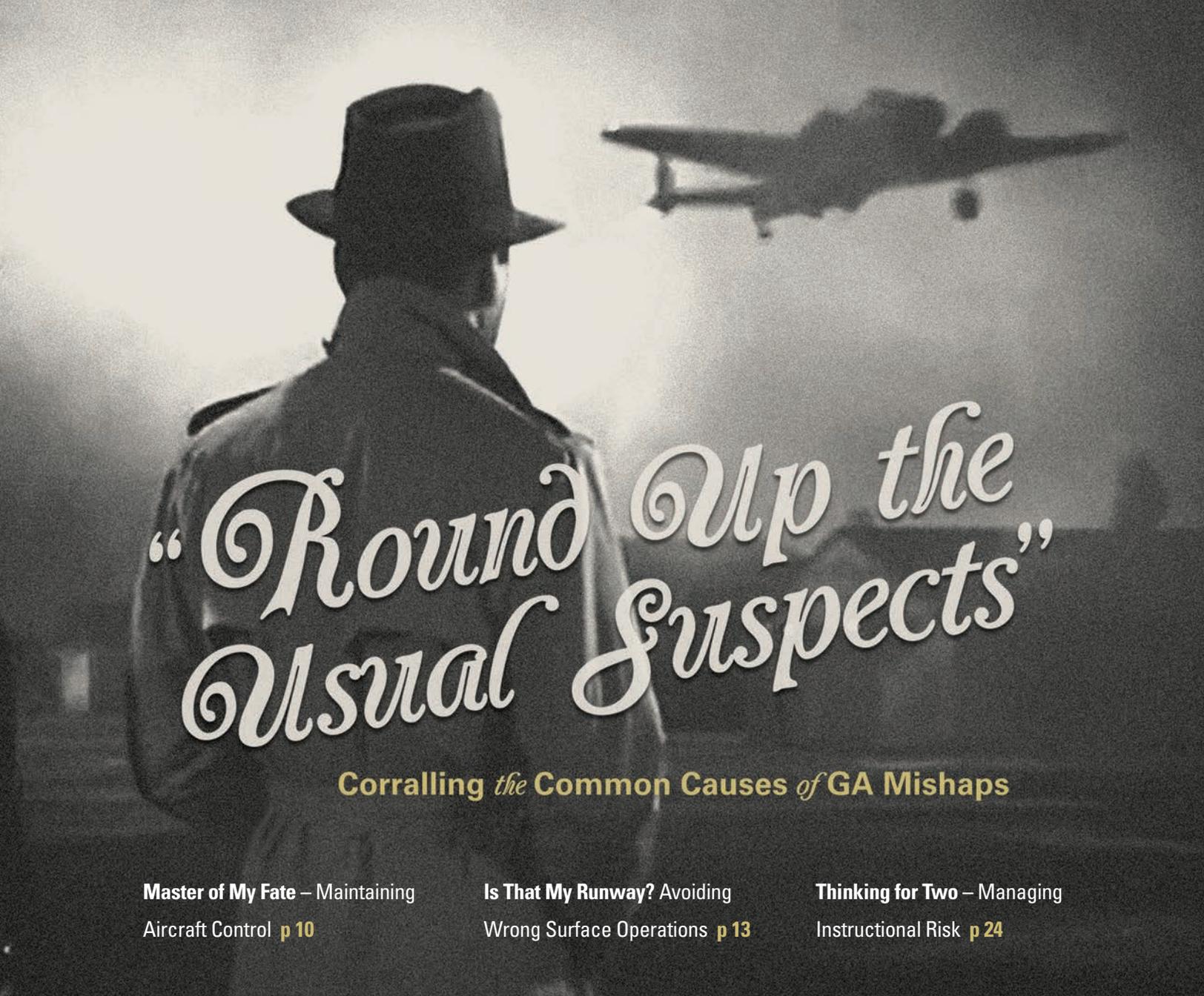


FAA Safety

BRIEFING

July/August 2018

Your source for general aviation news and information



“Round Up the Usual Suspects”

Corralling the Common Causes of GA Mishaps

Master of My Fate – Maintaining Aircraft Control **p 10**

Is That My Runway? Avoiding Wrong Surface Operations **p 13**

Thinking for Two – Managing Instructional Risk **p 24**



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The July/August 2018 issue of *FAA Safety Briefing* uses themes from the 1942 classic movie, *Casablanca*, to address a serious and potentially deadly issue: the persistently consistent causes of GA safety mishaps. We “round up the usual suspects” in our feature articles, covering familiar safety topics like loss of control, weather, runway safety, and fuel management.



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Cover and above: Screenshots of “Casablanca” by Warner Bros.



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It's Still the Same Old Story ...

... but with better ways to round up the usual suspects

The summary of the most recent edition of the AOPA Air Safety Institute's Joseph T. Nall General Aviation Accident Report — covering data through 2014 — opens with encouraging news: “The prior year's sudden and dramatic improvement in non-commercial fixed-wing safety was maintained in 2014.” But — and you knew that was coming, right? — it also includes this sobering and, frankly, frustrating observation:

The causes of non-commercial fixed-wing accidents remained similar to prior years (...). As in the past, personal flights suffered both disproportionate numbers of accidents and a higher rate of fatalities than flights for other purposes.

A Case of Do or Die

Notwithstanding constant concerted efforts to corral them, the usual suspect causes of GA accidents and incidents are as persistent as the common cold. But while colds don't usually kill their victims, too many of the “usual” GA accident causes do lead to fatalities. Those that don't hurt people sully the public perception of GA, and create risk because of the harm they *could* have done. We need to do better, and that's why we have borrowed from the 1942 classic movie, *Casablanca*, to organize this issue's roundup of the usual suspects.

But I want to use this space to focus on the critically important way that our “roundup” differs from the methods that Captain Louis Renault uses at the end of the movie.

The Fundamental Things Apply

The goal of FAA oversight is to assure compliance with the rules and standards that keep aviation safe. That means that we must find problems in the aviation system and assure that those problems are permanently fixed. The only way we can know about and proactively resolve problems in aviation that could lead to incidents and accidents is to strongly encourage the free exchange of safety information between airmen and the FAA. Airmen must openly tell the FAA about safety issues they have discovered and work with the FAA to fix those problems.

The FAA understands that the free exchange of safety information will not happen unless the airmen involved understand and believe that when they share that information with the FAA, and help fix the problem, they will not be punished by enforcement action. The FAA also understands that most airmen are both willing and able to comply with the rules that make aviation safe. We also recognize that there are those who are unwilling to comply or unable to comply. In order to fix problems and continually improve safety in aviation, we treat those two groups very differently.

Those who are willing and able to comply may still make honest mistakes. Those mistakes are not okay — they must be corrected now, and they must be prevented in the future. We can accomplish this goal through additional training, education, or changed procedures, and then we monitor to assure the change is permanent. Those changes are jointly designed by the airman and the FAA and documented as Compliance Actions. Each and every Compliance Action is a problem fixed, a risk mitigated, and an improvement to aviation safety.

Some airmen or operators may not be willing or able to comply with aviation rules. Those airmen represent the highest risk to safety in aviation because they will continue to deviate from the rules that control risk and make aviation safe. Enforcement (i.e., legal action) is appropriate and necessary for those airmen or operators who are unwilling or unable to comply with the rules. When the FAA uses enforcement, our intent is to cause the airman to become willing to comply or to remove that person from aviation. We take that responsibility seriously and pursue it very aggressively — we simply won't tolerate intentional non-compliance.

The fundamental thing is this: the FAA's goal for safety in aviation is to assure the free exchange of safety information to support collaborative improvements to safety.

The only way we can know about and proactively resolve problems that could lead to incidents and accidents is to strongly encourage the free exchange of safety information between airmen and the FAA.



Flight Instructor Challenge to Earn WINGS and Get \$10K

Advocates for Aviation Safety has recently become an industry member of the FAA Safety Team (FAASTeam). The group's focus is to help promote the FAASTeam WINGS program. Paul Burger, the Advocates founder, has contributed \$10,000 to create the CFI Sweepstakes Challenge. Flight instructors get an entry into the sweepstakes drawing each time they earn a pilot phase in WINGS — basic, advanced, or master. This year, flight instructors must be NAFI or SAFE members to participate; however, the 2019 sweepstakes will be open to all flight instructors.

For more information on the Advocates for Aviation Safety and the CFI Sweepstakes Challenge, go to MyWINGSInitiative.org.

Elimination of Telephone Information Briefing Service

As part of the FAA's efforts to modernize and streamline service delivery, Flight Service will eliminate the Telephone Information Briefing Service (TIBS) in the contiguous United States, effective Sept. 13, 2018.

TIBS is a continuous telephone recording of meteorological and aeronautical information that pilots can access without going through a Flight Service specialist. Since its inception in the early 1980s, the broadcast allows pilots to access weather and aeronautical information along their route of flight. However, it does not satisfy the requirement to become familiar with *all* available information prior to a flight.

Originally created by specialists using scripts, TIBS uses text-to-voice technology to record the briefing. Flight Service created TIBS when there was a large demand for briefings, with the potential for extremely long wait times.

With the advent of the internet and other enabling technology, the demand for information from Flight Service specialists has declined. From more than 3,000 specialists in more than 300 facilities during the early 1980s, staffing has decreased to fewer than 400 specialists in three facilities. Radio contacts have dropped to less than 900 per day, from an average of 10,000 per day.

There are multiple sources available to pilots to access weather and aeronautical information, which are often presented in an easier to understand

graphical format. Pilots no longer need to call a Flight Service specialist to adhere to Title 14 Code of Federal Regulations (14 CFR) section 91.103 to maintain awareness of weather and aeronautical information.

With the area forecast to graphical forecast change in October 2017, the TIBS recording no longer includes a synopsis. Without the synopsis, the information provided in the TIBS broadcast is less useful, which provides a further rationale for discontinuing the service.

A safety risk management panel was held in January to determine the impact of this change to the National Airspace System (NAS). The panel did not identify any new hazards associated with the elimination of TIBS.

AirVenture NOTAM Available



For one week each year, EAA AirVenture in Oshkosh, Wisconsin, has the highest concentration of aircraft in the world. Careful reading and adherence to the procedures in the special event Notice to Airmen (NOTAM) are essential to maintaining safety. Flight planning should include thorough familiarity with NOTAM procedures, as well as knowledge of primary and alternate airports. Carry a copy of the NOTAM for in-flight reference, which you can download at bit.ly/1K6nQ5T.

FAA Begins Drone Airspace Authorization Expansion

The FAA has begun expanding an automated system that will ultimately provide near, real-time processing of airspace authorization requests for unmanned aircraft system (UAS) operators nationwide.

The FAA is currently phasing in a nationwide beta test of the Low Altitude Authorization and Notification Capability (LAANC) that will deploy the system incrementally at nearly 300 air traffic facilities covering approximately 500 airports. The beta expansion follows successful evaluation of a prototype LAANC system last November.

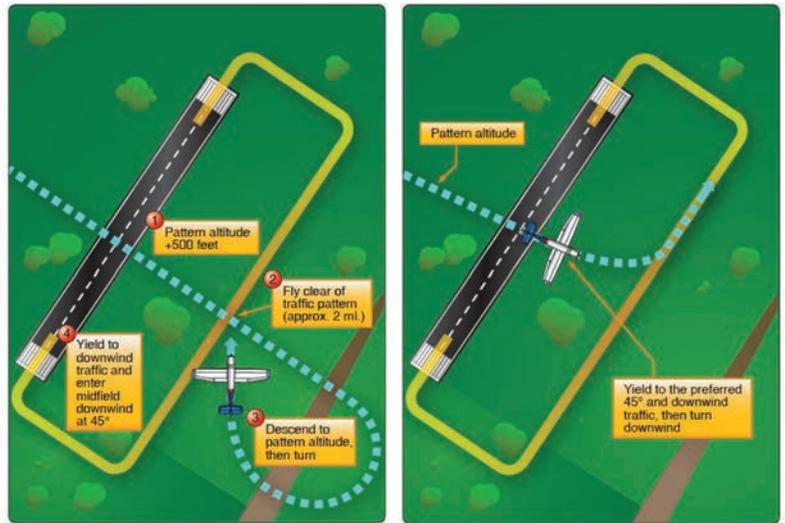
The first facilities taking part in the beta test are listed here: go.usa.gov/xQN7s. The final deployment will begin on September 13.

LAANC helps support the safe integration of drones into the nation's airspace. Drone operators using the system can receive near, real-time airspace authorizations. This dramatically decreases the wait experienced using the manual authorization process and allows operators to quickly plan their flights. LAANC uses airspace data provided through temporary flight restrictions, NOTAMS, and UAS facility maps that show the maximum altitude ceiling around airports where the FAA may authorize operations under part 107.

The FAA and industry are working together to develop and deploy LAANC applications, which will help set the global standard for a safe, and efficient unmanned traffic management system. It is an important step in developing the Unmanned Aircraft Systems Traffic Management System (UTM).

Update to Non-Towered Flight Operations Advisory Circular

There is an update to FAA Advisory Circular (AC) 90-66B, *Non-Towered Airport Flight Operations*. The AC calls attention to regulatory requirements, recommended operations, and communications procedures for operating at an airport without a control tower or an airport with a control tower that operates only part time. It recommends traffic patterns, communications phraseology, and opera-



Preferred and alternate entry when crossing midfield

tional procedures for use by aircraft, lighter-than-air aircraft, gliders, parachutes, rotorcraft, and ultra-light vehicles. The AC stresses safety as the primary objective in these operations, and it is related to the right-of-way rules under 14 CFR sections 1.1 (traffic pattern), 91.113, and 91.126.

Previous traffic pattern guidance was 800 feet to 1,000 feet above ground level (AGL). To eliminate any possible confusion arising from the 200-foot difference, the FAA's Aeronautical Charting Forum set the standard at 1,000 feet AGL, with left-hand turns unless terrain or obstacles mandate otherwise. Large and turbine-powered airplanes should enter the traffic pattern at an altitude of 1,500 feet AGL or 500 feet above the established pattern altitude. A recent change to the Aeronautical Information Manual introduced this standard, and the AC expands on it.

Safety Enhancement Topics

July: Fly the Aircraft First

A pilot's primary duty is to always aviate first.



August: Maneuvering Flight

The importance of maintaining safety while turning, climbing, or descending close to the ground.



Please visit www.faa.gov/news/safety_briefing for more information on these and other topics.



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The AC also addresses procedures for entering the non-towered traffic pattern and self-announcing an aircraft's position and the pilot's intentions. It makes clear that airplanes terminating an instrument procedure with a straight-in approach do not have the right of way over VFR traffic in the pattern. When circling to land, left-hand turns are standard, unless otherwise documented.

The AC update improves safety by standardizing operational practices and getting everyone who uses one of the more than 5,000 public-use, non-towered airports on the same page. Go to bit.ly/90-66B to download the 18-page AC.

UAS Integration Program Selects 10 Participants



The Department of Transportation (DOT) has selected ten state, local, and tribal governments as participants in the Unmanned Aircraft Systems (UAS) Integration Pilot Program. First announced last October,

this White House initiative partners the FAA with local, state, and tribal governments, which then partner with private sector participants to safely explore the further integration of drone operations.

"Data gathered from these pilot projects will form the basis of a new regulatory framework to safely integrate drones into our national airspace," said U.S. Secretary of Transportation Elaine L. Chao.

The UAS Integration Pilot Program will help tackle the most significant challenges to integrating drones into the national airspace and will reduce risks to public safety and security. The program is a coordinated effort to provide certainty and stability to communities, drone owners, and the rapidly evolving drone industry.

Over the next two and a half years, the selectees will collect drone data involving night operations, flights over people, beyond the pilot's line of sight, package delivery, detect-and-avoid technologies, and the reliability and security of data links between pilot and aircraft. The data collected from these operations will help the DOT and the FAA craft new enabling rules that allow more complex, low-altitude operations, identify ways to balance local and national interests related to UAS integration, improve communications with local, state, and tribal jurisdictions, address security and privacy risks, and accelerate the approval of operations that currently require special authorizations.

Don't Be Misinformed

Though visas were perhaps the biggest black market commodity in *Casablanca*, it's a fair bet that Signor Ferrari — proudly self-described as the “leader of all illegal activities in Casablanca” — also trafficked in opioids.

We are a long way from both the time and the place of the classic film, but some things are slow to change. Sadly, opioids have become an epidemic in America today. They are insidious because, except for opium, opioids can carry a sense of normalcy that belies the dangers they can cause.

Let's start with a bit of history and terminology. The earliest known drug in the opioid class is opium, which dates back thousands of years. In the early 1800s, morphine was isolated from opium and was widely used throughout the century. Towards the end of the 1800s, heroin was synthesized and it was marketed to suppress coughs and act as a “non-addictive” substitute for morphine. To put it mildly, he was misinformed. Heroin was, and is, a dangerous and addictive drug.

While all drugs in this category are opioids, a subset of drugs derived from the opium poppy (opium, morphine, heroin, codeine, etc.) are called opiates. They are either natural or closely related to naturally occurring compounds. Until recently, random drug testing for safety-sensitive personnel generally screened only for drugs in the opiate subset. That changed on January 1, 2018, and we now screen as well for opioids (which come from either a natural or synthetic source) such as hydrocodone, hydromorphone, oxycodone, or oxymorphone.

Social Stigma Traps

Many common opiates have different challenges than opioids. Heroin is without a doubt a disqualifying drug. It is a highly addictive, illegal, street drug.

Modern synthetic opioids like oxycodone, hydrocodone, fentanyl, tramadol, etc., can have many legitimate uses. Opioids can be very effective in relieving pain, especially for orthopedic injuries or acute conditions. If you are taking one of these drugs, you should discuss with your AME two separate issues: 1) the condition for which you are taking the medication, and 2) how long to wait before returning to flying. Everyone metabolizes medica-

tions at a different rate. This depends on many factors including the medication, frequency of use, the dosage and other parameters.

In general, the required wait time before returning to flight for most pain medication should be at least 3 days. This includes **hydrocodone** products such as Vicodin, Lortab, Lorcet, Vicoprofen, etc.; **hydromorphone** products such as Dilaudid; Codeine products such as Tylenol #3, Tramadol, Morphine IR (immediate release); and **oxycodone** products such as Percodan, Percocet, and Oxycontin. Other products require a minimum, 5-day no fly time, such as Morphine ER (extended release) and **oxymorphone** (Opana). Keep in mind that these waiting periods are the absolute minimum. Also remember that these medications, when combined with other medications, drugs, or alcohol, can have prolonged or more severe effects. In addition, because these drugs affect your central nervous system, you may feel well (euphoria) when you should still not fly.

Many people who become addicted to opioids start out as legitimate users of prescribed medications. Because these drugs are initially prescribed, the social stigma of using them is different from that of heroin which few people — especially a pilot — could credibly defend.

In addition to pain relief, opioids can also cause a strong feeling of euphoria. This high, combined with a greater social acceptability, can create a trap. If you find yourself becoming dependent on opioids, you need to talk to your doctor about other options.

Turning Around

If you do find yourself starting toward opioid addiction, I hope you can turn around. First, seek help from your doctor, your family, and your friends. Getting off opioids can be very challenging so a good support system is critical.

Once you address your immediate health needs, you need not forgo flying. The FAA's Human Intervention Motivation Study (HIMS) program allows medical certification of those with a history of substance dependence that has been adequately treated and monitored. As a HIMS Aviation Medical Examiner (AME), I saw firsthand the value the program can have for those who participate.



Coronary Heart Disease

“... A Gun Pointed Right at Your Heart”

Casablanca’s Captain Renault proclaimed that his heart was his least vulnerable spot, but that’s not the case for the rest of us. When discussing usual suspects in the medical field, coronary heart disease (CHD), also referred to as coronary artery disease (CAD), tops the list.

The leading cause of death in the United States for both men and women, CHD involves plaque, a waxy substance that can build up inside coronary arteries and limit the supply of oxygenated blood to your heart muscle. This buildup, known as atherosclerosis, occurs over many years. As this blockage increases over time, it can lead to potentially fatal complications like angina, heart attack, arrhythmias, and heart failure.

Aeromedical Concerns

Pilots diagnosed with CHD need to be aware of some important concerns regarding airman medical certification.

Though it often has no symptoms on the ground, CHD may become symptomatic at altitudes with less oxygen. Stressful situations (e.g., inclement weather encounter) that increase your heart rate may also result in CHD symptoms.

These symptoms may create serious distractions from essential flying tasks. More concerning though, is the risk of sudden death, which can result from rapid occlusion of a blood vessel by a clot. Twenty percent of deaths from cardiac disease occur suddenly and unexpectedly. The risk of sudden cardiac death is greater in those who have already had a heart attack. That is why it is so important to get symptoms evaluated early and to continuously monitor the disease once diagnosed.

Frequently Asked Questions

If I am diagnosed with CHD, can I ever fly again?

Very likely, yes. We look at many factors when deciding whether it is safe for an airman to continue to fly with CHD. These include how much plaque is present, and where it is located. The key is whether all areas of the heart will receive an adequate blood supply even under stress. Various treatments such as medication, stenting, and bypass surgery may be necessary to improve blood supply.

If I have a heart attack, can I ever fly again?

Likely, yes. Again, we consider many factors, such as how much heart muscle died and whether the remaining muscle can sufficiently pump. Adequacy of the blood supply must be demonstrated. The heart rhythm must be satisfactory. We can accept an implanted pacemaker under some conditions, but not a defibrillator.

Can I fly under BasicMed?

An airman with CHD who has required treatment or who has had a heart attack must have a one-time special issuance for each event in order to qualify for BasicMed.

How do I get a special issuance?

Start with your AME. He or she can guide you through the process. You can also consult the Guide for Aviation Medical Examiners online at bit.ly/2rMIJ1n. Under “methods to navigate through the guide,” select “disease protocols,” then “coronary heart disease,” for more detail about recovery times and follow-up documentation.

Who makes the decision about my special issuance?

Depending on the specifics of your case, and what class of airman medical certificate you are requesting, the decision may be made by one of the aeromedical certification physicians with experience in cardiology, or be referred to the Federal Air Surgeon Cardiology Panel. This panel consists of four to five, board-certified cardiologists who will review your clinical information and test results, and make a recommendation to the Federal Air Surgeon.

An Ounce of Prevention

The best way to protect your flying status is to reduce your risk factors for CHD. A few simple steps can significantly reduce your chance of disease progression or another heart attack. If you smoke, stop today. Exercise 30 minutes, at least five days a week. Shed excess weight and aim for a Body Mass Index (BMI) less than 28. Discuss with your doctor whether medications to lower lipids and blood pressure are appropriate for you.

	8:30 – 9:45	10:00 – 11:15	11:30 – 12:45	1:00 – 2:15	2:30 – 3:45	4:00 – 5:00
Monday July 23	Panel of ATC Experts Guy Lieser Steve McGreevy Wings: AK1 AFS081920	Round Up the Usual Suspects! Susan Parson Paul Preidecker Wings: AK2 AFS082129	Colorado Mountain Flying – Tips for Flying Safely in the High Country Bill Standerfer Wings: MK2 AFS081673	Runway Safety Wrong Surface Operations Cheri Walter Tom Frakes Wings: BK3 AFS082122	Enhancing Pilot Knowledge of Aviation Weather Research Ian Johnson, Gary Pokodner, Danny Sims Wings: AK2 AFS082132	Air Docs Dr. Gregory Pinnell, MD Wings: BK3 AFS082121
Tuesday July 24	1800WXBRIEF – The Best of the Future of Flight Service Joe Daniele Deborah Matties-Sharp Wings: BK3 AFS081674	FAA Medical Update Deputy Federal Air Surgeon Dr. Stephen Goodman Dr. David Schall Wings: BK3 AFS083484	The Engine Failure Emergency: A Survival Guide Woody Minar Wings: AK2 AFS082120	Fly the Easy Way; 21 Things that Make Your Flying Easier, Safer Larry Bothe Wings: AK2 AFS081931	TEM-Building: Adapting Threat & Error Management Paul Preidecker Wings: AK2 AFS082130	FAA Enforcement Hot Topics FAA Brian Khan Wings: BK3 AFS082123
Wednesday July 25	Pilot Fatigue and Fatigue Countermeasures Bruce Wright Wings: BK3 AFS082131	Ditching and Water Survival Commodore Robert Shafer Wings: MK2 AFS081916	How to Become a Commercial Drone Pilot: 14 CFR part 107 Explained Alan Frazier Wings: BK3 AFS082216	The Kings on Avoiding Unwanted Adventure John and Martha King Wings: AK1 AFS081913	Performance Planning and Decision Making: Life of a Ferry Pilot Sarah Rovner Wings: BK3 AFS082218	The Hunt for ADS-B Pitfalls and Benefits Susan Parson, Jamal Wilson and Paul Preidecker Wings: AK2 AFS082124
Thursday July 26	General Aviation Awards CFI of the Year AT of the Year FAA Team Rep of the Year	Decision Making In Crisis CDR Kirk S. Lippold, USN (Ret) Wings: MK2 AFS083486	"No Session" Meet the Administrator @ the EAA Pavilion *No Session*	All About Spins Catherine Cavagnaro Wings: MK2 AFS081915	Are You Really A Trained Pilot? Greg Feith Wings: AK2 AFS081992	Making Airspace Visible Peg Ballou Wings: BK2 AFS081972
Friday July 27	Basic Med Bradley Zeigler Wings: BK3 AFS081923	FAA Medical Update Federal Air Surgeon Dr. Mike Berry Wings: BK3 AFS081914	Operation Raincheck Air Traffic System Heather McNevin Wings: AK2 AFS081973	From Proficiency to Mastery: Safety is the Outcome Tom Turner Wings: AK2 AFS081928	Cloudy Skies, Clear Judgment FAA Susan Parson Wings: BK3 AFS081968	IFR – "Who's In Command" Guy Lieser Steve McGreevy Wings: AK2 AFS081995
Saturday July 28	IFR Decision Making: Chasing Choices Andy Miller Wings: AK2 AFS081967	Government Effort to Reduce TFR Violations Lt Col Scott "Cheetah" Petz Wings: MK2 AFS081680	VOR Minimum Operational Network Leonixa Salcedo, Vince Massimini, and Rick Niles Wings: BK3 AFS081919	Will The Real PIC Please Stand Up Greg Feith Wings: AK2 AFS081993	Tips and Tricks for Transitioning to New Aircraft and Avionics Rick Todd Wings: AK2 AFS083487	Visual Flight Illusions Michael Stretanski, D.O. Wings: MK2 AFS081676
Sunday July 29	Closed Find a WINGS program in your area all year long at: www.faasafety.gov					

Appropriate **AMT / WINGS** credit will apply to events by using the associated **#AFSXXXXXX** listed in each box

FAA Forum & FAA Exhibit Hall Opens Daily at 8:30 a.m.
 Schedule is subject to change; for updates check the QR code to the right or go to <http://bit.ly/FAAForums18>



SUSAN PARSON

“Round Up the Usual Suspects”

Corralling the Common Causes of GA Mishaps

The mission of this publication is to be the FAA safety policy voice for non-commercial GA. We also aim to improve GA safety by making airmen aware of FAA resources, helping readers understand safety and regulatory issues, and encouraging continued training. All those aims come together especially well in this issue of *FAA Safety Briefing*, which takes an admittedly whimsical and, we hope, engaging *Casablanca*-themed approach to addressing a deadly serious issue: the persistently consistent causes of GA safety mishaps.

Meet the Prime Suspects

The collection of common causes for GA accidents and incidents is remarkably (maybe depressingly) consistent. The AOPA Air Safety Institute's most recent Joseph T. Nall Report notes that a whopping 75 percent of causes of non-commercial fixed-wing accidents can be attributed to the action — or inaction — of the pilot.

The mix of specific pilot problems shifts; just for example, the Nall Report notes that reductions in the number of takeoff/climb and adverse weather encounters were offset by increases in numbers attributed to low-altitude maneuvering, descent/approach, and (sigh) fuel mismanagement.

It is also troubling to note that instructional flights are again the second largest category for accidents involving personal flying. While the classic VFR-into-IMC scenario accounted for fewer than five percent of all accidents, these mishaps are deadly. Almost 70 percent of accidents in IMC were fatal, compared to 17 percent of those occurring in VMC.

Though not usually fatal, runway incursions are another elusive member of the not-so-exclusive usual suspects club for GA mishaps. FAA statistics (go.usa.gov/xQ8eN) show an uptick in national runway incursions as compared with 2017.

The numbers were better for non-commercial helicopter accidents (fatal accidents dropped by 30 percent), but low-altitude maneuvering persists as a leading cause.

Sleuthing for Solutions

We'll take a look at each of these topics in this issue, all presented through the lens of famous phrases from *Casablanca*. But while we borrow the immortal "round 'em up" words of Captain Louis Renault, *Casablanca's* Prefect of Police, to talk about the causes, it's important to emphasize that we don't subscribe to his *post-hoc*, enforcement-centered methods of keeping order when it comes to airmen who make honest mistakes. Rather, as Flight Standards Executive Director John Duncan reminds us in this issue's Jumpseat department, the FAA's compliance philosophy aims at getting a steady flow of safety information we wouldn't otherwise have. We then work collaboratively with airmen to prevent accidents from occurring in the first place or, if prevention isn't possible, to keep them from re-occurring.



Facing page and above: Screenshots of "Casablanca" by Warner Bros.

It's Time

We know you've probably heard of all the usual suspects before, and you may even have more than a passing acquaintance with one or more of these pesky perpetrators. Safety-minded readers are similarly likely to be familiar with some — maybe all — of the suggested preventions and mitigations, so there may be more than a touch of the "can't happen to *me* because *I* would *never* do *that*" mentality. However, *somebody* does keep falling prey to the pesky perps. So since *nobody* is immune from making honest mistakes and errors, *everybody* will benefit if *anybody* who encounters this issue will take the time to get a "safety booster shot" through reading and heeding the proffered preventions.

To encourage that investment of your time, we challenge you to keep a tally of all the *Casablanca*-inspired words and phrases in this issue — extra credit if you can identify both the source and the scene. Send us your best guess via the links in Forum or through our social media accounts, and we'll recognize the winner in a future issue.

Are you ready? 

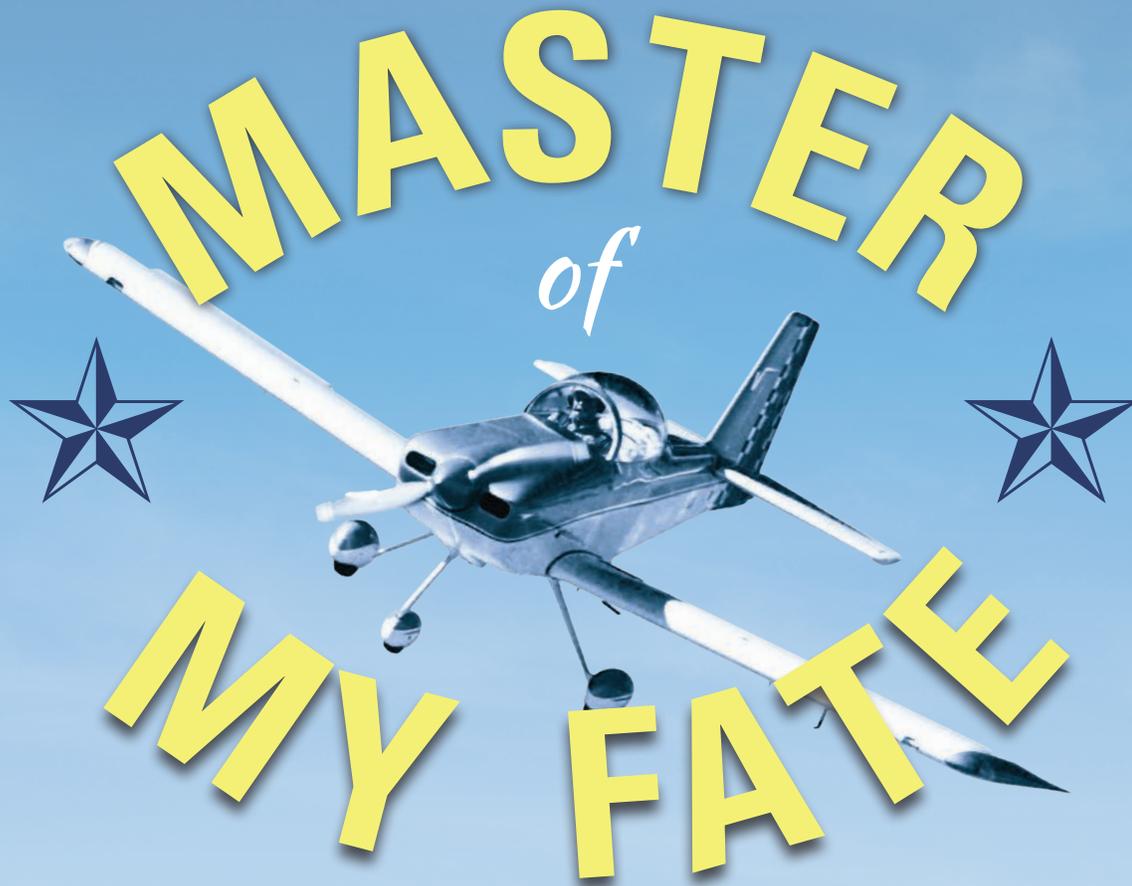
This issue of *FAA Safety Briefing* takes an admittedly whimsical and, we hope, engaging *Casablanca*-themed approach to addressing a deadly serious issue: the persistently consistent causes of GA safety mishaps.

Susan Parson (susan.parson@faa.gov, or [@avi8rix](https://twitter.com/avi8rix) for Twitter fans) is editor of *FAA Safety Briefing*. She is an active general aviation pilot and flight instructor.

Learn More

AOPA Air Safety Institute – 26th Annual Joseph T. Nall Report
bit.ly/2KEGXqP

FAA Runway Safety Information & Resources
1.usa.gov/1mvH6Nb



Maintaining Aircraft Control

SUSAN PARSON

When it comes to rounding up the usual suspects for GA accident causes, none may be higher on the “wanted” list than loss of control — especially loss of control in flight (LOC-I). LOC-I persists as the leading cause of fatal general aviation accidents in the United States and commercial aviation worldwide. Preventing LOC-I in GA has therefore been one of the perennial “perps” on the National Transportation Safety Board’s (NTSB) Most Wanted List of Safety Improvements — most recently making the list in 2017, and even more recently starring as the sole subject of an April 2018 NTSB Safety Forum.

The FAA’s *Airplane Flying Handbook* defines LOC-I as “a significant deviation of an aircraft from the intended flightpath [that] often results from an airplane upset.” It goes on to observe that maneuvering is the most common phase of flight for general aviation LOC-I accidents to occur, while cautioning that LOC-I accidents can — and do — occur in all phases of flight. The handbook appears to state the obvious when it notes that preventing loss of control is the pilot’s most fundamental responsibility; after all, what could be more important? With all the

authority that the regulations (i.e., 14 CFR section 91.3) confer to the pilot in command (PIC), the expectation is that as PIC, you are indeed the master of your fate — and, of course, the fate of anyone who happens to be in the airplane you’re flying.

The unfortunate reality is rather different. Far too often, performing maneuvers that should be well within the capabilities of a certificated pilot melts the “master-of-my-fate” mettle, and that happens even faster than in the *Casablanca* scene where Major Strasser’s arrival blows Captain Louis Renault’s blustery bravado to smithereens.

So what to do?

Opinions Differ ...

When it comes to ideas on how to corral this particular cause, pretty much everyone agrees that appropriate training is a critical piece of the answer. Pretty much everyone also agrees that, as the FAA states in the *Airplane Flying Handbook*:

To prevent LOC-I accidents, it is important for pilots to recognize and maintain a heightened awareness of situations that increase the risk of loss

of control. Those situations include: uncoordinated flight, equipment malfunctions, pilot complacency, distraction, turbulence, and poor risk management — like attempting to fly in instrument meteorological conditions (IMC) when the pilot is not qualified or proficient. [...] To maintain aircraft control when faced with these or other contributing factors, the pilot must be aware of situations where LOC-I can occur, recognize when an airplane is approaching a stall, has stalled, or is in an upset condition, and understand and execute the correct procedures to recover the aircraft.

There is rather less agreement, however, when it comes to the question of how to ensure that pilots actually get the appropriate training as defined above.

The FAA has always maintained that there is a difference between the larger universe of what is required for training, and the subset that constitutes what is appropriate for “checking” — more colloquially known as testing. Until June 2016, the testing standard (formerly the Practical Test Standards, or PTS; now the Airman Certification Standards, or ACS) for the slow flight and stalls area of operation framed the slow flight task to require flight at an airspeed at which any further increase in angle of attack would result in a stall. This construction required an applicant to perform the “slow flight” maneuver with the stall warning activated.

With the release of the Private Pilot – Airplane ACS in June 2016, the FAA revised the slow flight evaluation standard to reflect maneuvering without a stall warning (e.g., aircraft buffet, stall horn, etc.). The agency explained this change in SAFO 16010 as one approach to addressing loss of control in flight accidents in general aviation, noting that the previous inclusion of a maneuver that required intentional disregard of the stall warning activated is neither desirable nor intended. Rather, the point of the slow flight task is to assess the applicant’s ability to operate safely at the low airspeeds and at high angles of attack used during the takeoff/departure and approach/landing phases of normal flight. As revised, the slow flight task verifies that the applicant has learned airplane cues in that flight condition, how to smoothly manage coordinated flight control inputs, and the progressive signals that a stall may be imminent if there is further deviation from this condition.

Opinions Differ — Part Deux

The FAA received what you might call “spirited” feedback from the general aviation community on

this change. One of the primary concerns was that removing the requirement to test an applicant at what pilots like me learned as “minimum controllable airspeed,” or MCA, meant that instructors would not bother to ensure that pilots are still trained and proficient at maneuvering near the critical angle of attack (AOA) — or, just as important, understand what happens beyond the stall warning.

Although the FAA asserted in SAFO 16010 (since replaced by SAFO 17009) that a pilot is still expected to “know and understand the aerodynamics behind how the airplane performs from the time the stall warning is activated to reaching a full stall,” we did review the entire slow flight and stalls area of operation to ensure the knowledge, risk management, and skill elements adequately capture what a pilot should know, consider, and do relative to each task. As a result, the agency revised the evaluation standards for these tasks in the June 2017

editions of the ACS for the private pilot-airplane and the commercial pilot-airplane certificates.

With the primary focus on understanding aerodynamics associated with flying slow in different phases of flight, there is now only one knowledge element for slow flight available for evaluators to select for the practical test. The FAA refined and consolidated the risk management elements. In the skill task section of the slow flight task, we modified the phrasing to require an applicant to “establish and maintain an airspeed at which any further increase

The point of the slow flight task is to assess the applicant’s ability to operate safely at the low airspeeds and at high angles of attack used during the takeoff/departure and approach/landing phases of normal flight.



Screenshot of “Casablanca” by Warner Bros.

in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., aircraft buffet, stall horn, etc.).”

Everything In Its Proper Place

Contrary to what you might have read or heard, the “MCA” task element never disappeared from the practical test requirements — after all, it is not possible to perform a full stall task required on the

Contrary to what you might have read or heard, the “MCA” task element never disappeared from the practical test requirements — after all, it is not possible to perform the full stall maneuvers required on the private pilot-airplane task without first passing through that flight condition.

private pilot-airplane practical test without first passing through that flight condition. That said, to more clearly convey the expectation for evaluation of an applicant’s ability to recognize airplane

cues for an impending stall and a full stall, the FAA added a requirement for the applicant to “acknowledge cues of the impending stall and then recover promptly after a full stall has occurred.”

Here’s another way to think about the rationale for this approach to the slow flight and stall tasks:

- Slow flight — that is, flight at the airspeeds and configurations used in the takeoff/departure and approach/landing phases of flight — is a normal operation that should not be performed with continuous activation of the stall warning.
- Except in the case of a thoroughly briefed full stall maneuver, a pilot should always treat the stall warning as an “abnormal” situation, and promptly perform the stall recovery procedure.
- A pilot should always treat an unbriefed/unintentional full stall as an emergency situation, and execute a prompt and correct stall recovery.

You have probably heard the cliché that one definition of insanity is doing the same thing over and over again while (somehow) expecting different results. We weren’t making headway against LOC-I by testing pilots in a way that encouraged, indeed *required*, intentional disregard of the stall warning. So it only makes sense to try a new approach to putting this pesky perpetrator out of business. ✈️

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Learn More

FAA Airplane Flying Handbook (FAA-H-8083-3B)
bit.ly/2IYzSoN

FAA SAFO 17009 – Airman Certification Standards (ACS): Slow Flight and Stalls
bit.ly/2KtjDNk

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Is that My Runway?

TOM HOFFMANN

How to Avoid Wrong Surface Operations

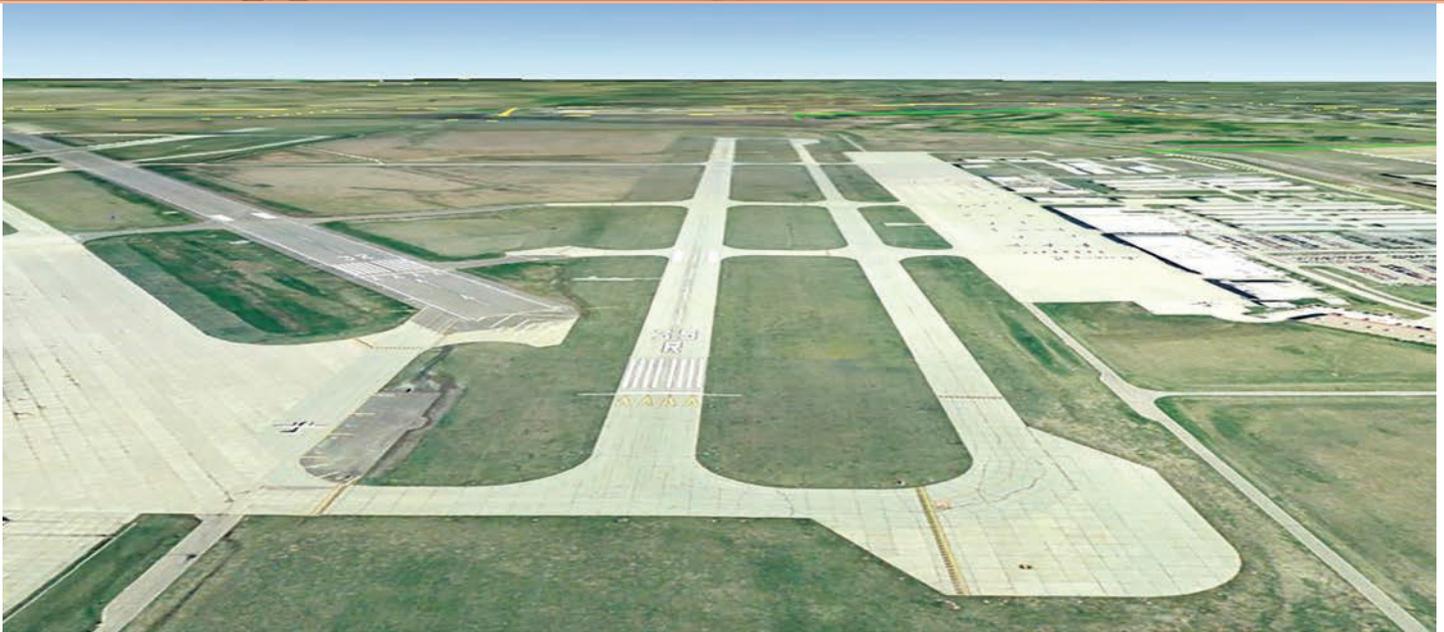
It can happen to the best of us. After a long taxi at a bustling and somewhat unfamiliar airport, it is not uncommon to find yourself at both a literal and figurative fork in the road before takeoff. “Is that my runway?” you mumble to yourself as you gaze at what appears to be a dizzying display of airfield location, instruction, and direction signs. It doesn’t help that you’re expecting an intersection takeoff and that you’ve got a long line of eager aircraft right behind you. Too embarrassed to click the mic and ask ATC for help, you feverishly scour the airport diagram in your lap, review your taxi instructions, and crosscheck your magnetic compass to get your bearings. You breathe a sigh of relief as you proceed to line up and wait on the correct runway. Crisis averted! Well ... for today at least. I say that because of the rather alarming rate at which these types of situations occur — save for the “crisis averted” part.

In fiscal year 2016, there were 331 wrong surface departures and a nearly identical 330 wrong surface events during the approach and landing phase in the United States. That’s almost two wrong surface operations per day, and it’s not just at the larger commercial airports. “The risks we are seeing are systemic from small airports to large airports,” says Tom Frakes, the FAA’s Central Region Runway Safety Program Manager. “We’re also seeing that wrong sur-

face operations can happen to pilots of all skill levels. Even pilots with years of experience are not exempt from making these basic mistakes.”

Cases of mistaken identity at airports have garnered a few unflattering headlines in recent years, but the gravity of the issue became most apparent in July 2017 when an Airbus 320 lined up and nearly landed on a loaded taxiway at San Francisco International Airport. The A320 dipped as low as 59 feet above the surface before executing a go-around and narrowly avoiding four passenger- and fuel-filled airliners. The event was a sobering reminder of the need for increased vigilance among pilots, as well as a need for the FAA to enhance awareness of this potentially deadly issue.

While the mishap at San Francisco involved a commercial air carrier during night operations, a closer look at both wrong surface takeoff and landing scenarios reveals that more than 80-percent were attributed to general aviation operations during daylight hours. The data also shows that 95-percent of wrong surface landings occurred when the visibility was three miles or greater. So what’s the driving force behind these cases of mistaken identity? In the spirit of this issue’s *Casablanca* theme, “let’s round up the usual suspects.” Along the way, we’ll also have a look at what you can do, and what the FAA is currently doing to combat this issue.



When parallel runways are in place, an adjacent taxiway might be confused for a runway.

There Are Certain Sections I Wouldn't Advise You to Invade!

The FAA defines a wrong surface operation as an event where an aircraft lands or departs on the wrong runway or on a taxiway, or lands at the wrong airport. The danger of such an action is obvious — the surface you mistakenly use could be closed, under repair, or damaged, or it may not be long enough to use for a safe takeoff or landing. You also run the risk of colliding with other aircraft or vehicles approved to operate on that surface, be it a runway or taxiway.

The good news is that there are several red flags, which, if identified in time, can help prevent you from being on the wrong surface at the wrong time. Causal factors for wrong surface operations typically fall into two main categories: the environment, and the pilot.

Of All the Runways, in All the Airports in All the World ...

Our opening scenario is a good example of how an airport's environment can contribute to a pilot becoming disoriented or sometimes completely lost. Everything from an airport's size, to runway layout, to activity levels, can contribute (sometimes in concert) to leading a pilot astray. Parallel runways seem to

be among the most common triggers for mistaken identity. Often a shorter and narrower parallel runway can get overlooked by a pilot approaching an airport and be mistaken as a taxiway. A different

colored surface on each of the runways can also add to the confusion.

Parallel runways can also be staggered laterally and horizontally, sometimes by several thousand feet. A pilot cleared to land on a 3,500-foot Runway 36R may not notice it is much further apart and set back than its 36L sibling — with the latter's clearly marked threshold, touchdown zones, and 8,000 feet of roomy space luring you to land. On the flip side, sometimes an adjacent taxiway can have the same effect, especially when offset parallel runways are in place. What you might think is 36R is actually a taxiway for 36L. The real 36R could be offset further back and harder to discern. The blue taxi lights on "36R" should give away the fact that it's not a runway, but that's not always a given with someone who's already mentally committed to land.

The moral of the story: if your runway has a letter in it, shore up your situational awareness and know what to expect when it comes to runway size, shape, and proximity. That means you need to study your airport diagrams, including those for alternates, very thoroughly before flight. You may also find it helpful to pull up a satellite picture online to get a more realistic view of what you should see.

The same vigilance for knowing your surroundings is required for departures. Complex airport geometry can be the downfall of many well-intentioned pilots, especially in a high-paced, busy environment. Pilots used to a single runway, non-towered environment can be in for a rude awakening at a larger airfield, with multiple taxiway and runway intersections. The FAA has labeled many of these complex intersections as "hot spots" on airport dia-

Wrong surface operations can happen to pilots of all skill levels. Even pilots with years of experience are not exempt from making these basic mistakes.

grams in order to heighten awareness and encourage pilots and vehicle operators to exercise caution in these areas. For a list of hot spot descriptions around the nation, go to bit.ly/2JP6SeT. You can also find airport diagrams, notes, and updates in the U.S. Chart Supplement (bit.ly/2jo7uwK).

Airport construction can require unexpected detours to customary taxi routes, as well as throw a wrench in your arrival plans. For the crew of the aforementioned A320 in San Francisco, construction played a major part in the crew's decision to line up on what they thought was the correct runway. The flight was cleared to land on Runway 28R, but the adjacent 28L was closed for construction that evening with its lights turned off. They overlooked the construction closure and assumed the parallel taxiway off 28R was indeed their runway. To be sure, always check NOTAMs for construction notices ahead of time. You can see an updated list here: bit.ly/2wVHy5k.

"Be sure to listen to ATIS in its entirety," adds Frakes. "Don't just get wind and the altimeter setting. You could be missing out on crucial construction notices, runway closures, or runway misalignment warnings."

Finally, let's not forget about how Mother Nature can impact a pilot's ability to navigate around the airport. Glare from the sun and wet pavement, snow cover, and fog can all make a departure and/or landing much more challenging. Always check the weather and try to anticipate any visibility restrictions that could present problems at takeoff and later at your destination. If your arrival at a new destination has you approaching right before sunset on a due west heading, consider rearranging your arrival time so it is easier to pick out the correct runway, or for that matter, the correct airport.

What in Heaven's Name Brought You to Casablanca?

That leads us to our next area of wrong surface operations, arriving at the wrong airport. Probably one of the most memorable of these situations occurred back in 2013 when a Boeing 747 *Dreamlifter* headed for McConnell Air Force Base (KIAB) in Wichita, Kan., instead landed at the much smaller Col. James Jabara Airport (KAAO), eight miles away. Contributing to the confusion was the fact that KAAO's Runway 18/36 is closely aligned to KIAB's Runway 01/19, a difference that was likely harder to

distinguish at night. A further complication was the proximity of a third airport in the vicinity, Beech Factory Airport (KBEC), with another identical runway configuration (01/19). In fact, the crew initially thought KBEC was where they erroneously set down, but coordinates relayed to them, as well as the sound of a small twin-engine turboprop flying overhead, confirmed that they had instead landed at Jabara.

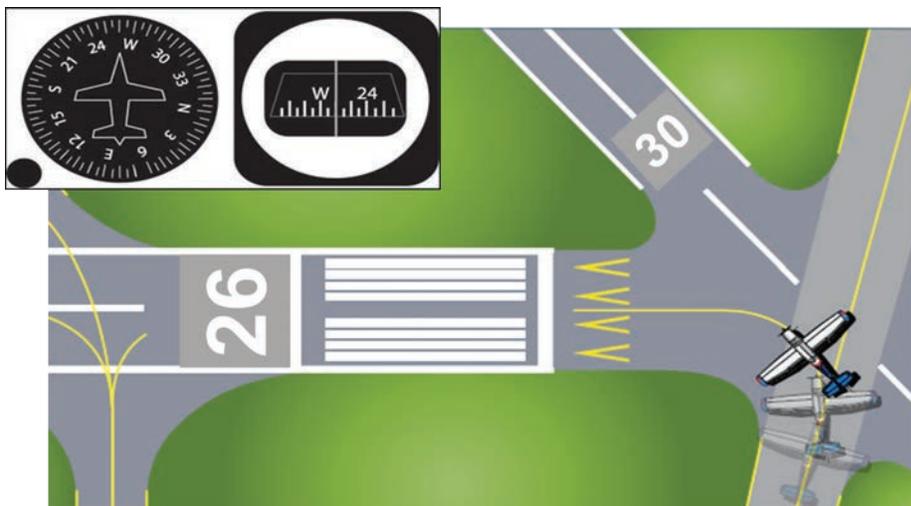
There is also a 6,000-foot difference between runways at KAAO and KIAB, so this just goes to show you how hard it can be to judge the distance of a runway at night. Another red flag in this scenario was the airport's rotating beacon. Civilian airports use alternating green and white flashes, while two quick white flashes between a green flash denotes a military airport.

To avoid having any off-track arrivals, it's best to get a good lay of the land ahead of time. Use nearby geographic features or landmarks to your advantage. Is your airport due east of a lake or large factory? Here's where brushing up on your pilotage skills can come in handy.

In addition to reviewing your sectional chart, Google Earth maps can give you an excellent bird's eye view of what to expect on arrival, including other area airports or features that could appear to be airports (e.g., drag strips, a closed road, a well-lit main street).

Another best practice to confirm you have the right airport (and runway) is to use any and all cockpit instrumentation and navigational aids at your disposal. Even if you're VFR, dial in an approach

Complex airport geometry can be the downfall of many well-intentioned pilots, especially in a high-paced, busy environment.



Always double check your heading before takeoff to ensure you're on the correct runway.



and/or use GPS to confirm your position. When you're cleared for landing, double check that you are using the runway assigned, not just what you expected to be in use. If you are ever in doubt of your approach or landing, perform a go around and promptly notify ATC.

Ain't You Planning on Going to Bed in the Near Future?

We've discussed several of the environmental factors that can lead to a wrong surface operation, but equally important are the many human factors that come in to play. Among those to watch out for are fatigue (did you stay up late watching the playoff game last night?); distraction (did you properly brief your passengers about sterile cockpit rules?); and expectation bias (are you merely hearing/seeing what you want to hear during approach or takeoff?) By following procedures and staying focused, you'll be able to bring your mental "A" game to every approach and landing.

We'll Always Have Washington D.C.

Due to the potential for fatal accidents, surface collisions, and runway incursions, the FAA has elevated wrong surface operations to a Top 5 Safety Issue within the agency. Although it has made tremendous strides to reduce the threat of runway incursions and wrong surface operations, the FAA is committed to doing more.

"We have been employing a proactive strategy of improved technology, outreach, and collaboration," said FAA's Air Traffic Organization COO Teri Bristol at this year's Sun 'n Fun International Fly-in in Lakeland, Fla. "We have made modifications to our systems that will give controllers more awareness of aircraft misalignments, collaborated with our airport colleagues on runway geometry issues, and talked with pilots and controllers about how to effectively communicate runway assignment changes."

Outreach is another vital component to the agency's mitigation strategy for wrong surface operations. In addition to the annual Runway Safety Action Team meetings held with aviation stakeholders at each towered airport across the nation, the FAA Safety Team will soon begin promoting a new education campaign focused on stressing the use of technology to improve runway safety. Also be on the lookout for an upcoming FAA Safety Summit, in Washington, DC on August 21, to address wrong surface operations.

... The Fundamental Things Apply

So before you head off to your next destination (Lisbon, anyone?), ask yourself, are you as prepared as you could be for this flight? For starters, I implore you to check out some of the links below for a refresher on surface safety awareness. A little research ahead of time will save you a lot of heartache later and hopefully keep you at the right place at the right time. "... On that you can rely!" 

Tom Hoffmann is the managing editor of FAA Safety Briefing. He is a commercial pilot and holds an A&P certificate.

Learn More

FAA SAFO 17010 - Incorrect Airport Surface Approaches and Landings

[go.usa.gov/xQPCZ](https://www.faa.gov/xQPCZ)

NTSB Safety Alert 033 – Landing at the Wrong Airport

[go.usa.gov/xQ99q](https://www.ntsb.gov/xQ99q)

FAA Wrong Runway Departures report

www.asias.faa.gov/i/studies/ASIASWRONGRUNWAYREPORT.pdf

SKYbrary – Wrong Runway Use page

skybrary.aero/index.php/Wrong_Runway_Use

Chino Airport Runway Safety Vignette

youtu.be/cO2r5ko7XIo

Look! Listen FOCUS

LIVES
ARE AT
STAKE!



- **IT CAN HAPPEN TO YOU:** When you're approaching an airport that has a set of parallel offset runways, you may accidentally land on the wrong runway than originally cleared for.
- **THE FIX:** During pre-flight, remind yourself of possible landmarks that will help you clearly identify the runways. Use your passengers help to pinpoint the correct runway!

Maybe

Not

**Avoiding the Perils
(and Regrets)
of VFR into IMC**

Today

A non-instrument-rated pilot originally planned for a much-anticipated cross-country trip but instrument meteorological conditions (IMC) conditions at the airport prevented the pilot from leaving on the intended day. After two days of waiting, IMC still prevailed; however several witnesses observed the pilot and the pilot's son at the fuel dock. At the time they all assumed that the pilot would taxi back to the hangar since the ceilings were between 200-400 feet above ground level (AGL). Instead, the airplane departed and disappeared from view into the overcast clouds. Multiple witnesses heard the airplane continuously change speed and direction, followed by the sound of the airplane impacting the ground. Airplane components were found in two locations: at the main wreckage site and along a debris path that consisted of the outboard portions of the left wing and left stabilator. Both the pilot and son suffered fatal injuries in the crash.

In 2011, shortly after departure for a VFR cross-country sightseeing flight over ocean waters, a Cessna *Skywagon* encountered IMC. Weather radar data and satellite imagery revealed that a tropical wave had produced thunderstorms with heavy rain and 47-knot winds. The aircraft was eventu-

ally recovered from the ocean. It was not equipped for instrument flight, nor was there any record of the pilot requesting a weather briefing at any time during the flight. The pilot and four passengers were killed in the mishap.

In 2015, a pilot attempted a solo VFR nighttime training flight despite the fact that the pilot's flight instructor had not cleared the pilot for this phase of training; believing the pilot needed more practice with an instructor on board. The flight was conducted on a dark, moonless night, under an overcast ceiling, and over the ocean. About seven minutes into the flight, the pilot encountered IMC and requested assistance from ATC. Despite their best efforts to vector the pilot, the aircraft impacted the ground at a high rate of speed and the pilot was killed.

Shocked!

Each year the Joseph T. Nall Report provides detailed analysis of GA accident data and safety trends. The most recent report (2014 data) indicated there were 1,163 non-commercial, fixed-wing accidents. More than 70-percent of the accidents that occurred in IMC were fatal compared to 15-percent of those that occurred within visual meteorological conditions (VMC). As the preceding accident sum-

maries demonstrate, flying VFR into IMC is still by far the most lethal causal factor for general aviation mishaps. For this reason, the National Transportation Safety Board (NTSB) has determined it to be a major safety hazard for the GA community.

When I was researching accidents that resulted from VFR into IMC, what stood out is that, unlike most of the other mishap causal factors, this particular rate of occurrence has remained stubbornly fixed — drifting between a 79 and 92-percent fatal accident rate for VFR into IMC over the last several decades. *Decades!* This is in spite of several significant upgrades in weather forecasting technology, and a rather robust safety awareness and education campaign effort specifically focused on the subject. My research left me shocked and more than just a little concerned about why this particular phenomenon keeps occurring.

So Why Does It Still Happen?

The FAA, NTSB, and various aviation safety advocates from industry and academia alike have tried to determine what happens when a pilot finds him or herself in the incredibly hazardous situation of being VFR flying into IMC conditions. Some researchers have theorized that cockpit technologies are insufficient at depicting meteorological conditions in real time. Others believe that pilots get distracted or that they overestimate their own aeronautical abilities. Others even go so far as to accuse aviators of being willful in their disregard for the dangers and deem flying VFR into IMC as an act of negligence.

While I think some of these ideas have merit (others, not so much) I, too, have a couple of different theories to offer on how VFR into IMC can happen. I humbly present to you what I call the “just around the river bend” bad idea; the “where’d everybody go?” gaffe; and the “there’s no place like home” hot spot. Let me explain further ...

It’s Just Around the River Bend ...?

In this situation, a pilot is flying along when the visibility starts to deteriorate. Instead of diverting from the undesirable condition or even just landing the aircraft, he or she continues, thinking that clearer conditions might be just “around the river bend.” Or worse, he or she relies on the latest weather app to “shoot the gap” and tries to fly through the inclement weather.

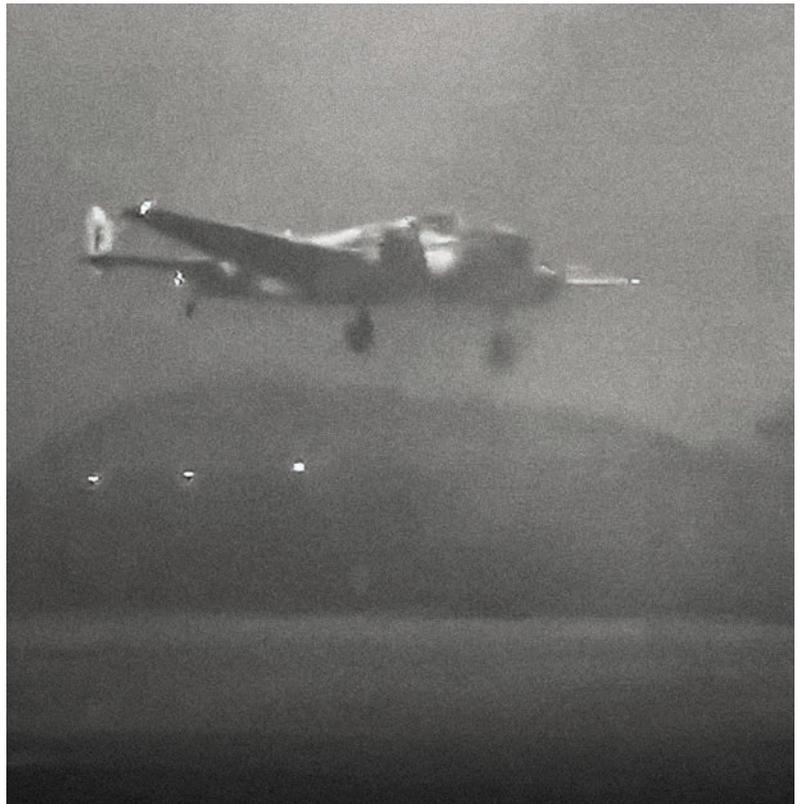
As you might have read in the May/June 2018 edition of this magazine in my “Weather Technology in the Cockpit” article, one mission of the

initiative is to educate pilots on the inherent inaccuracies, latencies, and limitations of weather displays in the cockpit. Information that you see on your favorite weather app might not be real-time, with lagging delays of up to 20 minutes! This means that the hole a pilot might try to slip through is no longer there upon arrival.

Another reason some pilots are reluctant to turn around is what human factors scientists call “sunk cost bias.” In general, we are often reluctant to turn away from something when we feel we have already put a certain amount of time, effort, and money into it. We would rather hang on just a little longer because we value the very real “wasted” effort more than the intangible hazard. Regardless, waiting for a hole that might never manifest, or prioritizing the extra \$\$ you burned trying to get to your destination is just a bad idea when dealing with foul weather or poor visibility.

Where’d Everybody Go?!

Another reason pilots might unwittingly find themselves in a bad “VFR into IMC situation” is because the conditions changed without the pilot observing it happening. Picture this: You are flying along in VFR conditions when you take a moment to fiddle with your radio that keeps emitting a high-



Screenshot of “Casablanca” by Warner Bros.

pitched squeal when you key the mic. Once satisfied that the squelchy situation is resolved, you look up to find yourself on the cusp between marginal VFR conditions and IMC. The soup is getting worse with every passing minute, and the “where’d everybody go?!” panic starts to set in.

This scenario is more common than you might think and is often the result of distraction — when something not pertinent to the task at hand captures and holds your attention; or fixation — when you are overly focused on one specific task to the detriment of all others. Poor situation awareness, lack of experience in interpreting changing weather conditions, and overestimating one’s own abilities are also common culprits in missing the shift from VMC to “not-VMC.” These mistakes can break down the efficacy of your aeronautical decision making which can lead to additional errors and an increase in risk. Mitigate them by creating systematic procedures that work for you and your aircraft type, and by creating and closely following a scan pattern.

There’s No Place Like Home

Very similar to the “just around the river bend” bad idea is the overwhelming desire to just get home. Colloquially this is called “get-home-itis” or “get-there-itis”; however, most theorists refer to it as plan continuation bias. It is similar to the former because the aversion to sunk costs is the same. But get-home-itis often goes much deeper because the pilot is particularly keen to accomplish his or her goal regardless of the fact that things have changed and there are indications that doing so is very risky (see Air Safety Institute video in Learn More). Sometimes complacency (I’ve done it before, so why shouldn’t it work this time?) over-reliance on technology, and good ol’ fashioned pride can get in the way of a person’s making the safer, albeit seemingly inconvenient choice.

Victims of plan continuation bias can be internally motivated (e.g., wanting to get home to a waiting family member), externally motivated (e.g., wanting to get the rental back to avoid additional charges) or a combination of both. When it comes to flying VFR into IMC, this bias can compel a pilot to make unsafe choices in his or her aeronautical decision making. An excellent and rather sad example is in the very first paragraph of this article. Despite the fact that we all know there is no place like home, sometimes it is better if the getting there desire waits in deference to a safer course of action.

An Ounce of Prevention ...

Benjamin Franklin once penned that “an ounce of prevention is worth a pound of cure.” Granted, Mr. Franklin was talking about fire safety; however, the axiom rings true today and is easily applicable to a host of different situations. Thorough pre-flight planning and being conscious of your skill set and experience level, aids in thwarting VFR into IMC tragedies. The best time to take preventative measures is by building a solid “Plan A” and a “Plan B” before you go fly. If you are anything like me you will even build a “Plan B++.” In your plans you should consider what alternate courses of action will be available if the weather or visibility starts to turn sour, when you should consider adopting those courses of action, and a realistic assessment of your own personal minimums so that you know exactly what you need to do to avoid ever getting close to a bad situation.

Trust me on this. Being in the thick of things is no time to try and reconnoiter and develop a Plan B. Spatial disorientation, in particular, often goes hand in hand in VFR into IMC accidents. When it comes to deteriorating weather conditions, if you are not instrument qualified, the best course of action is to remain in VFR conditions and land the plane as soon as possible.

To put a different twist on an oft-quoted line from the famous final airplane scene in *Casablanca*: If that plane leaves [VMC], you’ll regret it — soon and for the rest of your life. Because if you do the right thing, then maybe not today, and maybe not tomorrow, you will eventually get where you’re going, but without the regrets that you — or the loved ones you leave behind — would have if you fall prey to a VFR-into-IMC accident. 

Sabrina Woods is a guest writer for the FAA Safety Briefing. She is a human factors scientist with the FAA’s Air Traffic Organization. She spent 12 years as an aircraft maintenance officer and an aviation mishap investigator in the Air Force.

Learn More

VFR into IMC Seminar with FAA’s Jim Viola
[ntsb.gov/news/events/Documents/James_Viola_FAA.pdf](https://www.ntsb.gov/news/events/Documents/James_Viola_FAA.pdf)

SKYbrary “Inadvertent VFR into IMC”
skybrary.aero/index.php/Inadvertent_VFR_Flight_Into_IMC

AOPA Air Safety Institute, “Accident Case Study: In Too Deep”
[youtube.com/watch?v=W0lWsqAwYwY](https://www.youtube.com/watch?v=W0lWsqAwYwY)



Not an Easy Day to Forget

Remembering Fuel Management Before It's Too Late

JAMES WILLIAMS

Of all the voltage regulators, in all the airplanes, in all the world, it balks in mine. It was the end of the long, first day in a two-day flight across the country involving three airplanes. It was at least hour eight, maybe hour 10, but the day had gone well — emphasis on *had*. As day faded into night, a problem entered the scene. The lighting (panel and exterior) started to fade in and out. Except for our lights, which continued to surge in and out like a cut-rate dance club, our systems seemed to work. Still, we started shedding electrical load as we continued and completed our approach to the night's destination airport.

The next morning an Aviation Maintenance Technician (AMT) from the local FBO investigated our issue while we watched the other two airplanes in our group depart. Then we waited ... and waited ... and waited while the AMT diagnosed and replaced our faulty voltage regulator.

In the meantime, weather had become a challenge. Through an extensive in-person briefing with the Flight Service Station that happened to be on the field, we found a window, but it meant another delay. It was early afternoon before we were rolling down the runway at Louisville.

The ride was a bit rough, but we made it through a gap in the line of storms and arrived at our northern Georgia fuel stop six hours behind our planned

schedule. After refueling ourselves along with the airplane, we launched for a long last leg to Florida that worked, at least on paper.

By the time we were off the coast of Jacksonville, conditions didn't appear to be as favorable as the earlier forecast had predicted. Meanwhile, our fuel situation was getting tighter. At this point, though, we were close to home ... so we decided it would be okay — but we would do the visual approach to save fuel.

If you think we were compromising safety due to a fuel condition, you're right. With our fuel gauges showing less than ten gallons per side, we touched down at home. Out of curiosity (probably the morbid kind), I decided to take a quick look in the fuel tanks. I saw bare metal. My best guess is that we had a bit more than 30 minutes' worth of fuel, but the visual picture of what landing looked like with no more than the legally-required reserve fuel, sent a chill down my spine.

Little Things Make a Big Difference

It was not an easy day to forget. I'll always have Louisville as a reminder of how easy it can be for a good pilot to rationalize a bad decision. Louisville also gave me a vivid lesson in the much-discussed chain of events, because it was not just any single thing, but rather an accumulation of small things that put conservative strategy into the red. Delays exacerbated our existing fatigue. We had a strong

case of get-home-itis. The last leg was right on the line in terms of range. It was all legal, but it left little margin for error.

I'm not alone in my dance with the fuel management devil. The latest Nall Report attributes 76 accidents to fuel management in 2014. Of these, seven were fatal. Almost two thirds arose from poor preflight planning.

Personal experience is both a costly and inefficient way to reduce these accidents. So what can we do about it?

It Starts with Thinking

Since two thirds of these accidents arise during preflight, let's start there. Looking at my own errors, I was too aggressive on range estimates. It worked on paper, but it left me with few options for "what if" situations. A good set of personal minimums would have helped.

In hindsight, I could have used percentage-based fuel usage limits along with legal reserve requirements. Here's how that works. You might set a threshold for further analysis at the point where you've used 70-percent of total fuel with an upper "redline" limit of 80-percent. The percentage frame-

work is easily portable from airplane to airplane, regardless of the number or size of fuel tanks. It also is more consistent with longer-range aircraft, where a straight minute-based reserve is less strict. Best of all, it gives you a simple and practical way

to factor more than just the legal reserve into your planning. A flight that only projects a 30-percent fuel burn probably doesn't need as much examination as a flight that requires 80-percent of your fuel supply. But having a standard makes you actively consider it.

Another fuel management suggestion is to calculate flying time under several wind conditions. Then set baselines that allow you to see how a change in conditions will shift your planning from sensible to marginal. Failing to do that was one of my mistakes. If I had realized just how much of a difference a 10-knot wind change made to my progress, I would have reconsidered. Figuring this out at 8,000 feet, two thirds of the way through the flight, was far less useful.

Hardware Fixes

The simplest hardware fix is a timer, which the Nall report characterizes as probably the single

most effective tool for preventing fuel management accidents. Today's gadgets and apps are glitzier than the timer, but it is a simple tool that still has plenty of value — and you can easily transfer it from one airplane to another.

You can use it in several ways. The most obvious is to use a timer to track overall flight time. You might also build timer use into your personal procedures, letting it serve as a catalyst: Every X minutes, check destination weather. Every Y minutes, check ETA against original planning.

These discrete decision points can help you identify trends you might otherwise miss. For instance, on your last check, your arrival time was 10 minutes later than expected. This time, it's 15 minutes later. This trend tells you to start watching that metric more closely, and take action if it creates a problem. The same applies for weather. Humans tend to be very bad at detecting gradual change. Creating discrete data points makes this easier for our brains.

A more sophisticated (but also more costly) solution is the advice I got from a friend: "If you have an airplane, get a good fuel totalizer." Knowing exactly how much fuel you have onboard is a huge advantage. Totalizers remove (or correct) the assumptions made in flight planning. We may plan for ten gallons per hour of fuel consumption but actually burn less than nine. Knowing whether I have an extra three to four gallons on board might change my thinking. The same is true — but more critical — in reverse.

Rigging the Game

Sometimes we like to think life evolves as the spin of a roulette wheel, where the ball can land anywhere. But as *Casablanca's* Rick Blaine demonstrated in the casino section of his establishment, you can make good things happen by making it land exactly where you want it. So build a system of habits, techniques, and tools that maximize your chances of winning the fuel management game every time, every flight. 

James Williams is FAA Safety Briefing's associate editor and photo editor. He is also a pilot and ground instructor.

Learn More

Pilot's Handbook of Aeronautical Knowledge Chapter 16:
bit.ly/2nBxvNT

AOPA Air Safety Institute's 26th Joseph T. Nall Report:
bit.ly/2KEGXqP

Play It!

Taking Note of GA Safety Enhancements

For the many of us who have non-flying jobs and the usual range of personal obligations, maintaining aviation currency can be a challenge. In my own case, just getting to the airport — an hour's drive from my home even in light traffic — is not a practical post-work activity and, in view of how tired I usually am after a typical workday, the risk of GA flying would exceed my personal minimums anyway. Of course, I try to fly on weekends, but annoying details like weather, lack of airplane availability, and the press of what a friend deftly calls “life chores” like laundry and grocery shopping further erode currency flying time. If that sounds familiar, you're certainly not alone.

Noteworthy Notes

Even if you don't have an airplane handy, you can still keep your head in the game with aviation-related reading, just as you are doing with this publication.

When your time is really short, though, consider the option of working your way through the online library of GA Safety Enhancement Topic Sheets. Developed by the FAA in coordination with aviation community members of the General Aviation Joint Steering Committee (GAJSC), these bite-sized topic sheets focus each month on a specific safety topic that the GAJSC has identified as one of the “usual suspects” in GA safety mishaps. Topics addressed so far this year include:

Transition Training — June 2018
bit.ly/2GXxDfq

Best Glide Speed and Distance — May 2018
bit.ly/2rfMV9p

Smart Cockpit Technology — April 2018
bit.ly/2pRvYIM

Emergency Procedures Training — March 2018
bit.ly/2GapDc8

Maintenance Placards — February 2018
go.usa.gov/xnsPN

Enhanced Vision Systems — January 2018
bit.ly/2qQQYMn

The GA Safety Enhancement Topic Sheet archives (see URL in **Learn More**) go back to the mid-2013 start of this endeavor. That means that, including the Topic Sheets developed thus far in

2018, you now have 60 Topic Sheets to choose from — but of course, why choose when you can eventually read them all?

Behind the Scenes

A word about the GAJSC: its moniker is a mouthful, but this organization has an important role. In a nutshell, the GAJSC is a public-private partnership working to improve general aviation safety. The GAJSC's goal is to reduce the GA fatal accident rate per 100,000 flight hours by 10 percent from January 1, 2009 to December 31, 2018, with no more than one fatal accident per 100,000 flight hours by 2018.

To accomplish this goal, the GAJSC uses a data-driven, consensus-based approach to analyzing aviation safety data and developing risk reduction efforts called “safety enhancements.” This methodology is adapted from the highly-successful methodology pioneered by the government/industry Civil Aviation Safety Team (CAST), whose work has contributed substantially to the U.S. airline industry's stellar safety record.

In both CAST and the GAJSC, Safety Enhancements can include procedures, training, and equipment installations that, when implemented, may reduce the likelihood of accidents in the future. The two biggest Safety Enhancement categories right now — both prominently linked to the GAJSC's home page — are for Loss of Control avoidance, and System/Component Failure-Powerplant enhancements.

These bite-sized GA Safety Enhancement Topic Sheets focus each month on a specific safety topic identified as one of the “usual suspects” in GA safety mishaps.

Susan Parson (susan.parson@faa.gov, or @aviBrix for Twitter fans) is editor of FAA Safety Briefing. She is an active general aviation pilot and flight instructor.

Learn More

General Aviation Joint Steering Committee
gajsc.org

GA Safety Enhancement Topic Sheets — 2018
faa.gov/news/safety_briefing/

GA Safety Enhancement Topic Sheet Archives
faa.gov/news/safety_briefing/topic_archive/



Thinking for Two

Managing Instructional Risk

SUSAN PARSON

In the final scenes of *Casablanca*, Rick Blaine tells Ilsa Lund that he has been doing the thinking for both of them. As he urges her to get on the plane to Lisbon, he promises that “someday you’ll understand.”

Flight instruction can be like that. In fact, I have sometimes thought that flight instruction is akin to compressed parenting. The instructor starts with complete responsibility for the very survival of another human being. The task is to transfer the knowledge, attitudes, and skills necessary for the helpless human to understand, think independently, and make sound choices to navigate the complexities the real world serves up every day.

The nature of that task makes flight instruction a risky business. There’s always a lot going on, both inside and outside the aircraft. Since you, as the instructor, are the pilot in command, you have to do the thinking for both the trainee and yourself. Flight instruction inherently involves multitasking, so your attention is constantly shifting. There are lots of ways to get hurt if you are not paying attention to the right thing at the right time. The long-term stakes are high as well, since the things you teach will affect how the trainee flies in the future, both solo and with passengers on board.

Given those challenges, it’s not surprising that instructional flights were the second largest category of non-commercial fixed wing accidents in the AOPA Air Safety Institute’s most recent Joseph T. Nall

Report (analyzing 2014 data). While the Nall report notes that instructional accidents “continue to be among the most survivable in both airplanes and helicopters,” there were still 17 fatal accidents with 32 fatalities in the non-commercial fixed wing category. An instructor was on board in 219 accidents, which is almost 23 percent of the total.

We can — and we must — do better.

Expanding the Toolbox

Since 2011, the FAA has been working with aviation training community experts to develop the Airman Certification Standards (ACS) format to replace the Practical Test Standards (PTS). As you have probably read, the ACS is an enhanced version of the PTS, because it adds task-specific knowledge and risk management elements to the skill task elements in each PTS Area of Operation and Task. The ACS thus becomes the single-source set of standards for both the knowledge (“written”) exam and the practical test.

In June 2016, the FAA replaced the PTS for the private pilot-airplane certificate and the instrument-airplane rating with the corresponding ACS. In June 2017, we revised the ACS for the private pilot-airplane certificate and the instrument rating, and replaced the commercial pilot-airplane PTS with the first ACS for this certificate level. By the time you read this article, the June 2018 editions of these documents will be in effect, and the team is continuing

to develop the initial ACS for the Aircraft Mechanic certificate with Airframe and Powerplant ratings, the private pilot-helicopter certificate, the Airline Transport Pilot (ATP) certificate and — drum roll, please — the Instructor certificate.

To develop this document, the FAA rounded up an extraordinarily talented group of experts from the aviation training community. Those involved in the Instructor ACS are active flight instructors, and quite a few are also very experienced Designated Pilot Examiners (DPEs). Given the importance of the instructor’s role, the FAA/community members of the ACS team have devoted immense time and effort to getting it right. As of this writing, the team has just conducted initial “tabletop” workshops in Orlando and Scottsdale, in which we received feedback and suggestions from FAA aviation safety inspectors (ASIs) and DPEs authorized to administer the practical test for initial flight instructor applicants. It will take some time to incorporate (and validate) those improvements, but the draft ACS for the instructor certificate is now stable enough for me to offer a preview of its key features.

Format and Structure

Like other ACS documents, the Instructor ACS includes sections that define the acceptable standards for knowledge, risk management, and skills in the aeronautical proficiency tasks unique to a particular instructor certificate or rating. But there is a difference. The Instructor ACS is not a stand-alone document. Rather, it is to be used in conjunction with the appropriate “foundational” ACS for which the instructor-applicant seeks to provide instruction.

Because the Fundamentals of Instructing (FOI) Area of Operation is critical to each particular instructor certificate or rating, FOI Tasks are incorporated as a stand-alone Area of Operation at the beginning of the instructor ACS. To keep the emphasis on practical application of FOI concepts — not rote memorization — the team also intends to tie other Areas of Operation back to the FOI section wherever it is appropriate to do so.

Knowledge

The instructor ACS correctly places a lot of emphasis on “instructional knowledge.” That means that the instructor-applicant should effectively present the what, how, and why involved with the knowledge, risk management, and skill task elements. The concept of instructional knowledge also

includes the ability to demonstrate and simultaneously explain the skills associated with each task from an instructional standpoint. Where appropriate, it also includes the ability to describe, analyze, and correct common errors associated with tasks in the “foundational” private and/or commercial ACS documents. The instructor-applicant will be required to demonstrate instructional competence in the elements associated with each task, regardless of whether that task is unique to the instructor ACS or incorporated by reference from the foundational ACS.

Risk Management

As discussed already, risk management is a critical component to aviation safety. The instructor is involved with risk management on multiple levels. The draft instructor ACS thus addresses not only teaching the risk management elements in the foundational ACS, but also managing the risk of a particular phase of flight or maneuver.

The Safety of Flight appendix (Appendix 6) in the instructor ACS outlines the scope of risk management that an instructor-applicant will need to demonstrate. In addition, the FOI section includes an Aeronautical Decision Making and Risk Management task that focuses on teaching risk management, and on highlighting those risks a flight instructor may encounter while providing in-flight instruction.

Skill

The skill task standards expect the instructor-applicant to fly maneuvers to commercial pilot standards. However, the skill task elements emphasize the instructional nature of the exercise.

To stay up to date on the status of this and other ACS documents, bookmark the webpage shown below or, better yet, subscribe. 

The instructor’s task is to transfer the knowledge, attitudes, and skills necessary for the helpless human to understand, think independently, and make sound choices to navigate the complexities the real world serves up every day.

Susan Parson (susan.parson@faa.gov, or @aviatrix for Twitter fans) is editor of FAA Safety Briefing. She is an active general aviation pilot and flight instructor.

Learn More

FAA Airman Testing webpage
faa.gov/training_testing/testing/

Here's Looking at You, Kid!

The 2018 National GA Award Honorees

For more than 50 years, the General Aviation Awards program and the FAA have recognized aviation professionals each year for their contributions to GA in the fields of flight instruction, aviation maintenance/avionics, and safety.

The FAA and the General Aviation Awards Committee will present individual plaques to the recipients of this year's awards at EAA AirVenture 2018 in Oshkosh, Wisconsin, and add their names to the permanent plaque in the lobby of the EAA AirVenture Museum. The prize package for each national honoree includes an all-expenses-paid trip to Oshkosh and other special GA Awards activities. Meet this year's honorees!

Nominations and applications for the 2019 General Aviation Awards will be accepted starting July 1, 2018. If you are acquainted with a flight instructor, AMT, avionics tech, or FAA Team Rep whom you think might be deserving of an award at the local, regional, or national level, we encourage you to nominate him or her. If you are an aviation professional with a distinguished career in one of these categories, we encourage you to apply. For more information about nominating or applying, please go to GeneralAviationAwards.com/nominations.

2018 National Certificated Flight Instructor of the Year

Daniel P. Christman of Las Vegas, Nev., always knew



he wanted to be a pilot. His father was in the Air Force Reserve and regularly took Dan to the base to see airplanes. When he was 11, Dan's parents told him they would arrange flying lessons if he made the honor roll. He did.

Dan soloed on his 16th birthday and earned his private pilot certificate a year later. Since then, he has earned a range of certificates and ratings including air transport pilot (ATP) multiengine land, commercial pilot single-engine land and sea, instrument helicopter and glider, flight instructor single- and multiengine, instrument airplane, helicopter, instrument helicopter and glider, ground instructor advanced and instrument, flight engineer turbojet, and sUAS remote pilot.

Dan — call sign "Taz" — serves as a lieutenant colonel in the U.S. Air Force. He is the deputy commander of the Persistent Attack and Reconnaissance Operations

Center at Creech Air Force Base in Nevada and a military instructor/evaluator pilot. His military flight experience includes the Northrop T-38 Talon jet trainer, Rockwell B-1 Lancer heavy bomber, and General Atomics MQ-9 Reaper remotely piloted aircraft.

Teaching others to fly is a passion for Dan. In addition to his full-time duties with the Air Force, he averages 25-30 hours of flight instruction a month and another 10-15 hours of ground training every week. He has been an active flight instructor — either full or part-time — for more than 19 years. He has authored and taught numerous aviation/flight training courses for both fixed wing and rotorcraft. With more than 5,000 hours of dual instruction given in a diverse array of aircraft, Dan's experience and teaching style make him a highly sought-after instructor.

Believing that an empty seat is a missed opportunity, Dan is active in the EAA's Young Eagles program. He also serves as an aviation ambassador for an incentive ride-along program that motivates young enlisted airmen to aspire to the officer ranks and become pilots. (dan@chrisair.net)

2018 National Aviation Technician of the Year

C. William Pancake, Jr., of Keyser, W. Va., began his aviation career 62 years ago.



By age 12, he knew that he wanted to fly. He rode his bike to the local airport and befriended several pilots who became his mentors, taking him flying whenever they could.

Bill soloed on his 16th birthday and passed the private pilot knowledge exam the following year with a score of 100 percent. He later went on to earn certificates and ratings that include commercial pilot, instrument, multiengine, flight instructor, airframe and powerplant mechanic (A&P), and inspection authorization (IA).

Bill's lifelong passion for repairing and restoring small vintage airplanes — mostly Aeroncas — began at Baker's Air Park. Bill worked there until 1962, gaining an encyclopedic knowledge that eventually made him one of the most sought-after Aeronca Aircraft experts in the country.

In 1960, Bill began working for West Virginia Pulp and Paper Company (Westvaco) as an electronics technician. He stayed until his 2002 retirement, but he never lost his passion for airplane restoration and engine work. He opened his own restoration shop, Pancake Aviation, in 1973, and what started as a sideline job grew into a successful enterprise.

In 2006, Bill received the FAA's two highest awards — the Charles Taylor Master Mechanic Award and the Wright Brothers Master Pilot Award — given, respectively, for being an aircraft mechanic and a pilot for 50 years without any infractions, violations, or accidents. At the time Bill received these awards, he was one of only 40 U.S. airmen to have received both. In 2008, Bill was inducted into the EAA Vintage Hall of Fame at AirVenture, and six years later into the West Virginia Aviation Hall of Fame.

Bill has presented technical forums at AirVenture for 33 years, and he serves as an EAA technical counselor and flight advisor. He has written for, or been featured in, *Air and Space Magazine*, *EAA Sport Aviation*, *Vintage Aircraft*, and the *National Aeronca Association Magazine*. (wvav8r@comcast.net)

2018 National FAA Safety Team Representative of the Year

Dr. Catherine E. Cavagnaro of Sewanee, Tenn., is a mathematician by training.



She received her bachelor's degree in mathematics at Santa Clara University in 1987, and her doctorate in mathematics at the University of Illinois in 1995. She currently serves as a professor of mathematics at the University of the South.

In that capacity, she has developed and implemented courses in such areas as aerodynamics, differential equations, and mathematical modeling. She notes that aviation provides a treasure trove of real-world examples for her mathematics courses.

In addition to her academic work, Catherine owns and operates the Ace Aerobatic School in Sewanee, Tenn. Widely known as an expert on spin training, recovery, and avoidance, she also gets rave reviews on videos she makes to help pilots understand the complex aerodynamics of spins and unusual attitudes. Catherine filmed a 60-turn spin in her Cessna *Aerobat* to show

that the recovery is the same after three turns. From 2004-2008, she served as a test pilot, spin demonstration pilot, researcher, and visiting professor of aviation systems at the University of Tennessee Space Institute. While there, she served on the icing team that modeled the longitudinal stability characteristics of NASA's DHC-6 *Twin Otter* in various icing configurations.

Catherine's array of certificates and ratings includes airline transport pilot single-engine land, commercial pilot multiengine land, single-engine sea and glider, and a flight instructor single- and multiengine and instrument. She serves as a designated pilot examiner and lead volunteer FAA Safety Team (FAASTeam) representative at the Nashville FSDO.

Over the past 15 years, Catherine has become highly sought-after as a speaker, and her aviation safety articles have been published in various magazines. She has a knack for making complex aviation concepts accessible and entertaining to non-technical audiences. As one attendee at Catherine's presentation at the 2017 AOPA Regional Fly-In in Groton, Conn., put it to AOPA, "Catherine Cavagnaro's seminar was the best one I've ever seen on any topic." (catherine@aceaerobaticschool.com)



A Most Vulnerable Spot *The Importance of Proper Torque*



The so-called little things in life can make a big difference, especially in the realm of aircraft maintenance. One such item is the application of proper torque, an increasingly important safety topic in aviation maintenance. From 2009 to 2015, over 45 aircraft incidents and accidents resulted from improper torque applied to engine fasteners during maintenance, resulting in a loss of propellers, internal engine damage, and powerplant failures. It's no exaggeration to say that in many cases, it's a case of do or die.

"Torque procedures are a critical component of your maintenance process," says Jim Hein, former airworthiness lead for the FAA Safety Promotion Program Office (SPPO). "It is essential for maintenance technicians to determine what torque is required

for each application and then properly apply that amount of torque to ensure the integrity of the aircraft and help prevent fatal GA accidents."

So what is torque, and why is it so important?

The Fundamental Things Apply: Torque 101

Torque is the specified force (the tightening down) that you need to apply to fasteners (nuts, bolts). It is not a finger-tight feeling that you've turned it just enough. Torque is the specific range, as prescribed in the aircraft's maintenance manual, for the twisting, turning force needed to create the proper tension. The tension you create is what makes fasteners perform the way the engineers intended.

You Must Remember This

An important rule is to use a calibrated torque wrench every time you torque your fasteners.

Here's why. If you don't apply the proper torque force per the manual, fasteners can fail, the nut and bolt threads can strip, and the fastening hardware can loosen.

During the aircraft's design process, the aerospace engineer selects the particular fasteners that can withstand the various vibrations and fluctuations in loads, pressures, and temperatures that the aircraft may experience. The engineer also specifies the foot-pound rating for proper torque on those fasteners, as well as the required lubricants that will allow the fasteners to turn and create the proper tension. You can find these specifications in the aircraft maintenance manual.

The engineers designed the ratings for that particular aircraft, engine, or application. If the manual provides a different torque rating than what you're used to applying, for example, don't just torque by instinct. You have to use the torque specified in the manual. If you apply the wrong torque, your fasteners will not work.

If you apply too much torque, you could stress and overstretch the fastener, which will cause it to fail. If you under-torque it, the fastener will not attach properly and will loosen over time causing fretting wear and tear, and early fastener failures.

Another critical rule is to avoid distractions. If you do get distracted when you're doing a fastening job, STOP. Go back three steps to re-inspect your work.



Torque Best Practice — Use Torque Seal to verify at a later time/date that you have completed the application of torque to the fastener.

Torque Turning Point

To help prevent fatal GA accidents due to failure of the powerplant system, the General Aviation Joint Steering Committee (GAJSC) examined National Transportation Safety Board (NTSB) reports that included system component (powerplant) failure as a causal factor. An in-depth study of six fatal accidents, where inadequate bolt torque led to powerplant failures or loss of propellers, led the GAJSC System Component Failure-Powerplant (SCF-PP) Working Group to determine that this is a critical maintenance safety topic that is often overlooked. As a result, the GAJSC SCF-PP Working Group developed a maintenance safety enhancements program aimed at mitigating the risk of improper torquing techniques and increasing awareness about the importance of proper torque.

As part of this effort, the FAA Safety Program Promotion Office is developing an Airworthiness Topic of the Quarter for fiscal year 2018, along with a new online course on proper torquing techniques that will be available beginning January 1, 2019. Check out www.faasafety.gov/AMT/amtinfo for details.

On That You Can Rely

In upcoming issues, *FAA Safety Briefing* will address the GAJSC maintenance safety enhancements to educate the maintenance community about powerplant and component failures, the third ranking cause of fatal GA accidents. Future topics will include proper torquing techniques, mitigating V-band clamp failures, new service difficulty report (SDR) processes, maintenance placards, A&P education/training, ignition systems, and education and outreach.

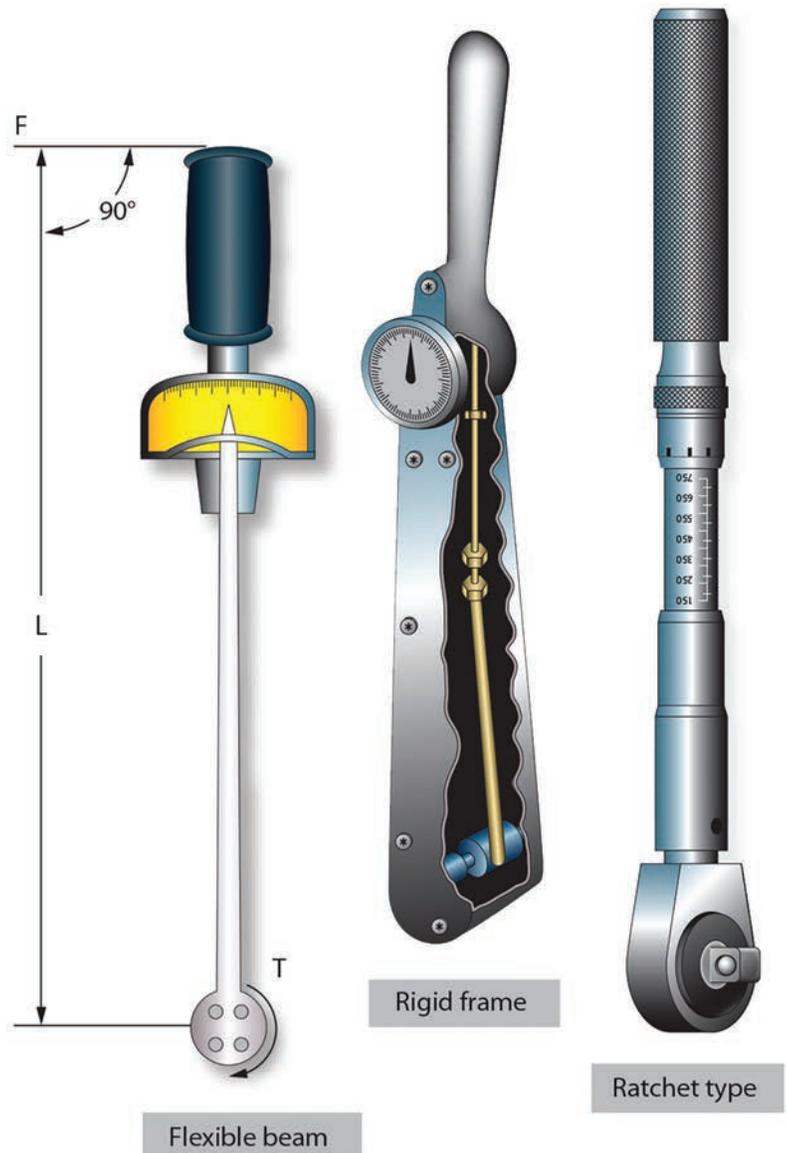
Learn More

National Transportation Safety Board Safety Alert, Take Time to Torque

[ntsb.gov/safety/safety-alerts/Documents/SA_056.pdf](https://www.ntsb.gov/safety/safety-alerts/Documents/SA_056.pdf)

FAA Torque Values – AC 43-13, Acceptable Methods, Techniques, and Practices — Aircraft Inspection and Repair, Section 3

bit.ly/2LqQXEp



Basic formula $F \times L = T$

F = Applied Force

L = Lever length between centerline of drive and centerline of applied force (F must be 90° to L)

T = Torque

Common Torque Wrenches

Fly with us on Twitter

 @FAASafetyBrief





Compliance Philosophy at Work

The idea of failing to meet safety standards may be an uncomfortable topic. Apart from any immediate outcomes, such as an accident, maintenance failure, airspace incursion, etc., there may be worry about the potential response from the FAA. As John Duncan notes in this issue’s Jumpseat department, though, the FAA has adopted Compliance Philosophy as a more effective means of addressing safety deviations by individuals and organizations.

If you’re a regular reader of *FAA Safety Briefing*, you are probably already familiar with the FAA’s Compliance Philosophy. Implemented in 2015, Compliance Philosophy puts the focus on accountability and safety improvements to regain and maintain compliance. The agency requires and expects compliance with all regulations, but even the most dedicated people can make honest mistakes. Realizing the importance of getting critical safety information, the FAA seeks to have an open and honest conversation so that deviations are understood and appropriately addressed. So instead of focusing on blame and punishment, Compliance Philosophy puts the focus on

accountability and safety improvements to regain and maintain compliance.

Keep in mind the Compliance Philosophy is not a get-out-of-jail free card; there are some behaviors that just cannot be tolerated in the NAS. If a person is unwilling to make the necessary corrections to regain and remain in compliance, or is unable to do so; or in cases of intentional, reckless, or criminal behavior, and in some matters involving a lack of qualification, the FAA uses the tool of enforcement action.

Notice the correlation between the reasons above and information in the table, which shows the top five cited regulations against individuals in an enforcement action thus far in 2018. (Note that this is for Flight Standards enforcement cases, closed between 10/1/2017 and 03/30/2018. It does not include cases resulting from a failure to appear for a re-examination under 49 U.S.C. Section 44709). These represent the more serious cases that the FAA is addressing.

So how has the Compliance Philosophy been working? Looking at the numbers for 2017 (individuals and organizations), Flight Standards documented just over 6,900 total

Regulation	Short Description	Examples
91.13(a)	Careless or Reckless Operations	<ul style="list-style-type: none"> • Student pilot flying with a passenger • Very low flight over populated beach
43.13(a)/(b)	Maintenance Performance Rules	<ul style="list-style-type: none"> • Extensive aircraft modification with non-approved parts or documentation • Failure to use approved data
91.123(a)/(b)	Compliance with ATC Clearances and Instructions	<ul style="list-style-type: none"> • Multiple deviations • Failure to complete remedial training
61.23(a)(i)	Requirement for Medical Certificate	<ul style="list-style-type: none"> • Not having required medical certificate; usually discovered during incident or accident
61.59(a)(2)	Falsification	<ul style="list-style-type: none"> • Falsifying endorsements and logbook entries • Falsifying certificate application

A list of the top five cited regulations against individuals in an enforcement action thus far in 2018. Regulations provided are in reference to Title 14, Code of Federal Regulations.

compliance actions. These represent safety issues corrected, and safety improved, without the need for enforcement. During the same period, the number of enforcement actions totaled approximately 1,150. Compared to years prior to the implementation of the Compliance Philosophy, this represents roughly a 75-percent drop in the use of enforcement action to correct a deviation.

The FAA's updated approach has also resulted in restoring safety in a timelier manner. The average compliance action took an average of 31 days to complete — light speed compared to the months and years associated with enforcement action. Enforcement cases initiated since introduction of the Compliance Philosophy have also been resolved in less time, on average, when compared to previous years.

The FAA has also looked at recidivism rates. The numbers are encouraging. Over 9,100 indi-

viduals have received either a compliance action or enforcement action (from early 2016 through 2017). Of those, only about one percent were found to have committed a similar type of deviation more than once. In these terms, the actions taken by the FAA and individuals in the aviation community have achieved a 99-percent success rate. Looking at the numbers for multiple, yet different types of deviations, the percentage goes up to around 2.9 percent.

We hope this gives you a clearer picture of the FAA's responses to safety deviations and the improvements made under the Compliance Philosophy. For more information, go to faa.gov/about/initiatives/cp/.

Jeffrey Smith is the manager of the FAA's Airman Training and Certification Branch, currently on detail to the Flight Standards Compliance Philosophy Focus Team. He holds an ATP certificate, is a flight and ground instructor, and is certificated as an A&P mechanic.

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Can This Really Be Happening?

Good thing Ingrid Bergman had a plane that allowed her to leave Humphrey Bogart's life — even if reluctantly — in the classic movie *Casablanca*. A World War II-era helicopter would have been far more dangerous, especially in that cloudy, rainy weather that helped set the melancholy mood in one of the film's final scenes.

Weather plays a major role in helicopter accidents and is one of the reasons why the U.S. Helicopter Safety Team (USHST), a joint industry and government safety advocacy organization, has placed so much importance on developing safety enhancements, or steps, that address visibility and unintended flight into instrument meteorological conditions (UIMC). No self-respecting FAA official would have advised Bergman to climb aboard a helicopter in that weather.

Readers of the *FAA Safety Briefing's* May/June issue might recall that we introduced the first six of the 22 total Helicopter-Safety Enhancements (H-SE) that the USHST developed to help make helicopter flights safer. Those six H-SEs focused on pilot competency. The four that we introduce this time focus on visibility and UIMC.

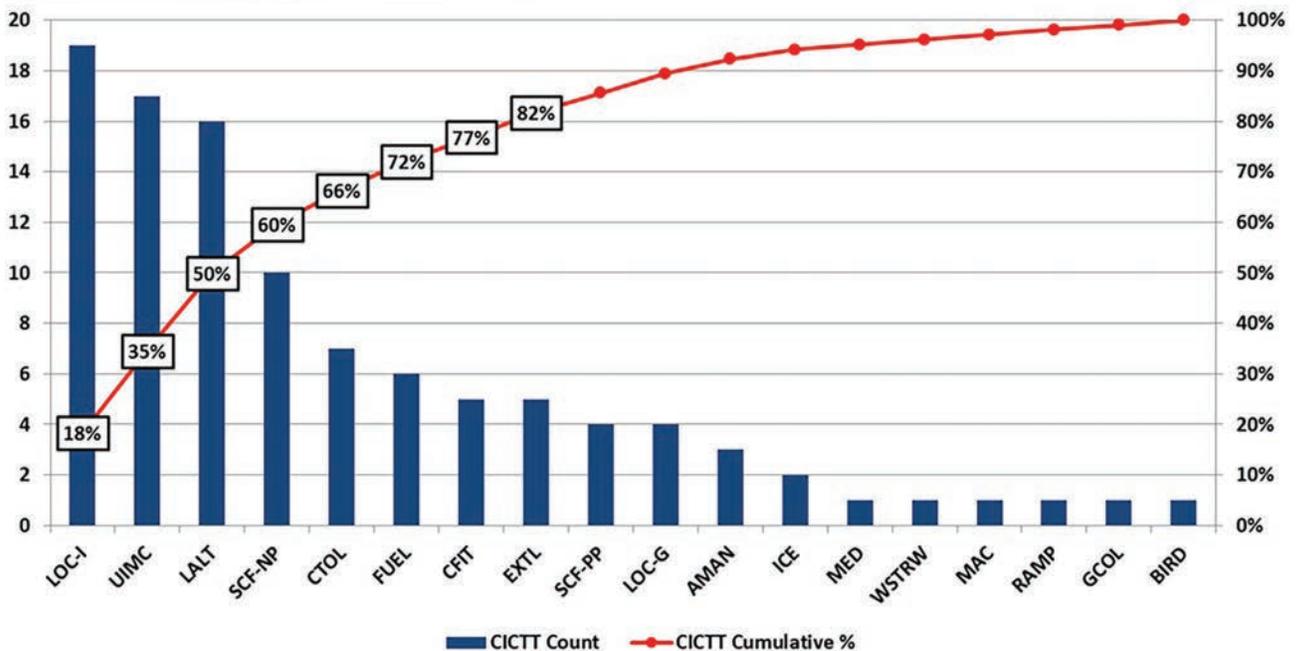
As you can see in the USHST chart, UIMC was the second leading cause of fatal accidents from 2009 through 2013. A typical UIMC event begins when the pilot departs in weather that is clear for Visual Flight Rules (VFR) or perhaps marginal for maintaining VFR. Once airborne, the pilot finds both the ceiling and visibility lower than expected. As the flight progresses, visual references (trees, landmarks, the horizon) fade into the murk until the pilot finds the helicopter engulfed in the clouds, often at low altitude and close to obstacles. A common reaction is, "Can this really be happening?" UIMC risk is especially high at night, when deteriorating weather is more difficult to detect. A pilot not prepared for UIMC may panic: the loss of visibility often leads to loss of control, which is the leading cause of fatal accidents.

To help avoid or reduce the risks of UIMC, the safety team has developed these four safety enhancements:

Detection and Management of Risk Level

Changes: The helicopter industry will develop and promote recommendations to help pilots and non-flying crewmembers detect increased risks during a

"PRIORITY" OCCURRENCE CATEGORY BY CICTT CY 2009 – 2013 (104 FATAL ACCIDENTS)



The 2018 International Rotorcraft Safety Conference

The FAA will host the 2018 International Rotorcraft Safety Conference in an effort to reduce the national helicopter accident rate, particularly among small operators.

The three-day free event, featuring nearly 35 presentations and seminars, will offer Inspection Authorization and FAA AMT and WINGS credits.

The conference will take place October 23-25, 2018, at the Hurst Conference Center in Hurst, Texas, a Fort Worth suburb. Expected attendees include pilots, mechanics, small business owners, industry executives, operators, and government regulators from the United States and abroad.

The conference will open with introductions and a speech by internationally-known personal resilience speaker Jack Harris. The conference will then feature programs designed to appeal to the entire helicopter community including presentations about the latest accident data, surviving a helicopter accident, and occupant protection research. On day two, breakout sessions will cover U.S. Helicopter Safety Team initiatives, night vision goggles, how to avoid inadvertent IMC, and more. Mechanics will discuss preventive maintenance for rotor blades, flight data monitoring, safety cultures, and managing maintenance operations. On day three, the group reconvenes into a single helicopter community for sessions on bird strikes, airworthiness directives, accident investigations, and unmanned aircraft systems.

The conference will be an excellent opportunity for pilots, mechanics, and other stakeholders to review, discuss, and consider new ways to help improve rotorcraft safety. Rooms will be available for meetings and networking.

For more details, including registration information, go to www.faaahelisafety.org. If you have questions, contact Gene Trainor at 817-222-5123, at eugene.trainor@faa.gov, or at the FAA Rotorcraft Standards Branch, 10101 Hillwood Parkway, Fort Worth, Texas 76177.



flight; how to effectively communicate the increased risks to one another; and how best to handle a particular risk. This project will include researching how people make decisions in demanding situations, managing crew resources, and creating and promoting educational materials. Target completion date: October 1, 2020.

Threat and Error Management Pilot Training: The FAA and industry will develop the concept of threat-and-error management (TEM) as part of initial and recurrent pilot training. This safety effort has proved to be invaluable in helping to reduce accidents over the years. The enhancement will help the GA community and FAA adopt a more structured system for teaching TEM. Target completion date: July 1, 2022.

Enhanced Helicopter Vision Systems: The FAA and industry will research, develop, and promote the use of enhanced helicopter vision systems technologies to assist in recognizing and preventing unplanned flight into situations where visibility worsens because of weather and to increase safety during

planned flights at night. The FAA will work to create a pathway to make it easier to get federal approval of vision-enhancing technologies. Target completion date: February 1, 2023.

Recognition and Recovery of Spatial Disorientation: Industry will develop training for recognizing and recovering from the effects of spatial disorientation. The training will emphasize all available resources installed on the aircraft, such as an autopilot. Target completion date: October 1, 2020.

Enacting these safety enhancements will greatly increase the odds for a safe flight. It's all about creating a partnership between the USHST and you — and that is clearly the beginning of a beautiful friendship. For more information on the USHST H-SEs and helicopter safety please visit: www.USHST.org.

Gene Trainor is a technical writer/editor for the Rotorcraft Standards Branch in Fort Worth, Texas.

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To Request or Not to Request?

Hello, I just read the latest “How to Talk Like a Pilot” article. I thought it had some outstanding techniques. However, this particular paragraph brought up something that I get pretty tired of as I fly long cross countries.

“... when you have a non-urgent request, let ATC know by transmitting the word ‘request.’”

What I find is that this congests an already busy frequency. They make their radio call with a “request,” which then causes the controller to respond with “go ahead with your request,” which then causes the original caller to say what he wants. Three radio calls to accomplish what one could have done.

— Jim

Hi Jim, we appreciate you taking the time to give us your comments. It gives us an opportunity to share best practices with all of our readers. We checked with our friends at ATC, and here are some replies. The bottom line is to use your best judgment before you key the mic.

“I don’t mind if someone calls up with just the call sign and ‘request’ if they hear that I’m busy ... that lets me know that I can get back to them when I have the chance.”

“I’ve had pilots check in or call with lengthy requests a number of times when I’m just about to turn an aircraft onto the final; sometimes that longer transmission comes at the perfectly wrong time which makes me even busier (and then I have to tell the aircraft checking in to standby, anyway). Again, this might just be a personal preference on my part, but when I’m busy, I’d usually prefer to have a shorter initial call than a longer one, and I’ll get back to the pilot as soon as I can.”

Pilot Patter Queries from Twitter

In 17 years in the air and on the air, I’ve never heard anyone say tree or fife.

— Tracy

Thousand isn’t proper? It’s Tousand?

— Jason

Hi Tracy and Jason, thank you for your comments in response to the article, “Decoding (and Parroting) Pilot Patter,” in the Mar/Apr issue. It gives us an opportunity to reaffirm the article’s key points. To avoid confusion with similar sounding consonants, the International Civil Aviation Organization (ICAO)

has a standard phonetic alphabet for aviation use when English is used for communication. “Tou-sand,” “tree,” and “fife” are the correct pronunciations for transmitting the numbers “thousand,” “three,” and “five.” See bit.ly/ICAODoc, page 5-5, for more information. Also check out the FAA Safety Team’s Radio Communications Phraseology and Techniques course at bit.ly/RadioComms.

Piping Up on PIREPS

I have a question about your recent article about PIREPS. To save time switching frequencies, I often ask the ATC controller if I can simply give him a PIREP to which they almost always say yes. I am wondering if doing this gets that PIREP into the system or does it simply give the info for that particular controller to share verbally with other pilots he may be talking to?

— @rkrulik

Thanks for your question. “Giving a PIREP directly to a controller actually accomplishes both,” says Sarah Patten, Air Traffic Control Specialist at FAA Potomac TRACON. “As controllers, we are able to enter PIREPs directly into the system to share with other pilots and controllers. The controller who receives the PIREP will fill out a PIREP form, which then gets manually entered into the system by another controller, usually within minutes. Once we enter the data and hit ‘submit,’ the information is shared.

If I’m the controller receiving a PIREP, I always try to share the information with any aircraft on my frequency that it may impact, and I’ll often call over to controllers working surrounding sectors too, if the report might impact them.”

Let us hear from you! Send your comments, suggestions, and questions to SafetyBriefing@faa.gov or use a smartphone QR reader to go “VFR-direct” to our mailbox. You can also reach us on Twitter @FAASafetyBrief or on Facebook [facebook.com/FAA](https://www.facebook.com/FAA).

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Who Are You, Really?

If there was a time before I loved flying, it was so long ago that I don't remember. I do remember that my first sharply focused memory — maybe my very first memory of any kind — was an Eastern Airlines B-727 “WhisperJet” trip when I was just three years old. The WhisperJet was more modern than the elegant Lockheed *Electra* in the final scene of *Casablanca* but, just as in the film, darkness and mist were gathering as my family walked across the ramp after landing (no jet bridges back then). I remember clutching my beloved doll (Bridgette) in the crook of my elbow, repeatedly turning my head to gaze back in awe at the marvelous magical machine that had just transported us to another world.

My first airplane experience was as much a turning point for me as the closing airplane scene was for the characters in *Casablanca*. That early childhood experience sparked a lifelong love for aviation, and made it an integral part of my life

for decades before the time, opportunity, and money came together to permit flight training. While my resume lists all kinds of things I did before becoming a pilot,

Most pilots and mechanics want to operate safely. We know what's at stake, so we do our best to follow the rules — but that's not always enough to keep us safe.

I sometimes wonder who I really was and what I did before, to the point of thinking that the pre-pilot life belonged to someone else. In many ways, it did. Learning to fly profoundly changed my sense of self, which is why the intro on the blog page I use as an online portfolio states that “being a pilot is key to how I define myself.”

We've Got a Job to Do

If those thoughts resonate with you, then I hope you will understand and share the fervent commitment to making headway against all the usual suspects behind GA accidents and incidents. We've “interrogated” a number of the prime suspects in this issue, hoping that if we better understand what happens and why, we'll gain insight on more effective resistance. If our community is to survive and thrive, we need to learn how to prevent both the

usual and the not-so-usual suspects from causing harm to its members.

In this connection, I recently had the privilege of participating in an instructor Airman Certification Standards (ACS) workshop with a group of similarly passionate aviators. We did our share of enthusiastic hand-waving, “there I was” hangar flying during breaks and lunch. But we spent the working sessions diving into the challenges we all see and brainstorming what we might do to address them — and also to encourage more people to join the aviation community.

Both the workshop participants and the government/community members of the ACS Working Group are firmly committed to the ACS as one way to improve GA safety. Consistent with one of the core concepts in the FAA's compliance philosophy, we believe that most airmen — both pilots and mechanics — want to operate safely. We know what's at stake, so we do our best to follow the rules. As the GA accident and incident tally demonstrates, though, it's not enough to just follow the rules.

There is no way to make rules that cover every possible situation, so we need to proactively identify hazards and mitigate risk. The trouble is that many of us were never taught to think or act in those terms. Flight training involved some ground discussion, in-flight performance of what wags sometimes call the “FAA ballet” of standard maneuvers, and a quick post-flight debriefing.

That's where the ACS comes in, and where it has serious game-changing potential. By making risk management an integral part of each task in the evaluation (testing) standard, we encourage better training in that critical skill. In turn, we hope that instilling the habit of risk management into the very DNA of new pilots and mechanics will increasingly keep the usual suspects at bay — and keep us all safe in the sky we call home.

Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of FAA Safety Briefing. She is an active general aviation pilot and flight instructor.



Corey Stephens and A Beautiful Friendship

Operations Research Analyst, FAA Office of Accident Investigation and Prevention



Hearing the roar of a B-52 *Stratofortress* flying over his backyard every day at Ellsworth Air Force Base in South Dakota, piqued Corey Stephens's interest in aviation as a

young boy. It also helped that he was able to watch many aircraft from unique locations, thanks to his father's job as one of the Air Force electrical shop chiefs at the base. Corey read about aviation, and he planned to join the U.S. Air Force to be a pilot.

However, since the end of the first Gulf War coincided with an abundance of military pilots, Corey decided to go to the University of Central Missouri for a bachelor's degree in aviation and a master's degree in aviation safety. He also earned a master's degree in space studies from the University of North Dakota. While in school, Corey interned with the flight safety department at United Airlines and was a co-op student at the NTSB. These opportunities, and an eye-opening aircraft accident investigation course he took in school, indicated the beginning of a beautiful friendship with aviation safety.

Corey's first job after graduate school was as a flight operational quality assurance (FOQA) analyst at United Airlines. That led to a position with the engineering and accident investigation section of the Air Line Pilots Association, International (ALPA), where he worked for 11 years before joining the FAA.

"It was my first, full-time accident investigation gig, but I also got the opportunity to work on a newly established safety initiative called the Commercial Aviation Safety Team (CAST)," notes Corey.

"I had the opportunity to work several accidents, participate on many industry teams, and travel all over," he said. "The time I spent with United and ALPA working on safety initiatives like CAST gave me a tremendous appreciation for the value of working together as a community towards common safety goals."

The collaboration that built the CAST process has been refined to what it is today with the help of

Corey, and that work laid the foundation to make aviation safer through the General Aviation Joint Steering Committee (GAJSC), the U.S. Helicopter Safety Team (USHST), and the Unmanned Aircraft Safety Team (UAST).

As an analyst with the Integrated Safety Teams Branch, Corey supports the Aviation Safety Analytical Services Division through CAST, GAJSC, and the Aviation Safety Information Analysis and Sharing (ASIAS) program. The safety teams provide subject matter experts and program support, leadership, analysis, coordination, and facilitation expertise. ASIAS connects approximately 185 data and information sources across government and industry, including voluntarily provided safety data. The ASIAS program works closely with the CAST and GAJSC to monitor known risk, evaluate the effectiveness of deployed mitigations, and detect emerging risk.

"GAJSC has developed 40 safety enhancements related to inflight loss of control and engine issues," he explains, "all developed in conjunction with the GA community to mitigate risks linked to fatal GA accidents. Twenty-three of these mitigations have been completed."

Outreach activities continue to strengthen knowledge and awareness of the FAA's efforts, and encourage GA organizations to join the ASIAS program to share data.

"We have had tremendous growth in GA participation in ASIAS," Corey said.

Corporate and business flight departments, universities, flight schools, and private individuals now actively participate in ASIAS. It allows the FAA and the community to discover potential risks in the system and then work together to develop mitigations for those risks before they could potentially become an accident.

If you have questions about GA safety enhancement topics or want to contribute data, stop by the GAJSC/ASIAS booth inside the FAA hangar at AirVenture. If you cannot make it to Oshkosh, keep a lookout in the GA community. Corey volunteers with Civil Air Patrol as a safety officer in West Virginia, is an EAA member, and can be seen over the skies of Easton, Md., where he flies with friends to keep current.



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