

FAA Safety

BRIEFING

March/April 2011

Your source for general aviation news and information



Standing Down *for* Safety



Federal Aviation
Administration

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The March/April 2011 issue of FAA Safety Briefing focuses on the four themes of the 2nd Annual FAA Team Safety Standdown: positive flight attitude, going beyond preflight, en route cruise, and maneuvering flight. You will find articles on each of these critical areas where training and focus can improve general aviation safety.

Photo by Tom Hoffmann



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Jumpseat

Where I Stand on Safety

I am one of you—an airman. As a teenage line-boy, I spent hours fueling the planes I dreamed of flying. The airport was my second home. My passion for aviation became the driving force behind single- and multi-engine ratings, a CFI, an ATP, and an eventual airline career.

My passion for aviation, its people, and safety is the driving force behind my “day job.” As FAA Administrator, I am honored to lead the most professional aviation safety organization in the world.

I’m passionate about safety, and I’m determined to see the general aviation safety record improve. My staff and I anguish over accidents that take the lives of our pilots, families, and friends. When I read through the fatal GA accident reports, I often shake my head. Why do GA pilots still have so many accidents that defy logic?

Understanding the “why” is critical to the “how” of preventing accidents and allowing us to focus on the joy of our favorite pastime. That is why I am privileged to introduce and encourage your participation in the 2011 FAA Safety Team Safety Standdown. This year’s theme is *Stand Up to Error, Stand Down for Safety*, and that is exactly what I am asking you to do. You can participate at the main Standdown site in Lakeland, Fla., on April 2, at one of the more than 90 Standdown events around the country during the month of April, online at www.FAASafety.gov, or through your perusal of this magazine.

The Right Attitude

Our research shows several critical areas where training and focus can improve GA safety performance. The FAASafety Team Safety Standdown and *FAA Safety Briefing* teams have worked closely together to bring you workshops and articles targeted to these specific areas.

The first, *Positive Flight Attitude*, is at the top of my list. Don’t confuse getting paid to fly with being a professional pilot. Every one of us needs to be committed to professionalism, whether you are a student pilot or a grizzled veteran. Each of us must

approach every flight as if our lives depended on it because our lives *do* depend on it—and not just our lives. Professionalism should characterize every action we take.

The second is *Going Beyond Preflight*. Did you check the forecast with the same diligence you displayed when you were on page one of your first logbook? Did you do a thorough preflight, notwithstanding that icy wind? Are your charts up-to-date and in your hands?

The third focus area is *En Route Cruise*. Are you lackadaisical, or are you paying the kind of attention professionalism demands? That means doing the right thing even when no one is looking. It means precision piloting: staying on altitude, on heading, and on task.

Last, but not least, is *Maneuvering Flight*. Loss of control in maneuvering flight often results from inattention to airspeed. See page 20 for some basic airspeed awareness tips, and always remember that attention to airspeed is critical.

Aviation in our country has never been safer. Still, we can—we must—do better. I hope this year’s Safety Standdown gives you food for thought, as well as concrete ways to improve your safety practices.

Each of us must approach every flight as if our lives depended on it because our lives do depend on it—and not just our lives.



Safety Bulletin Addresses Maneuvering Speed Misconceptions

Based on findings from an air carrier accident in 2001, the FAA issued a Special Airworthiness Information Bulletin (SAIB) that addresses a concern about maneuvering speeds (V_A) for all aircraft certificated under Title 14 Code of Federal Regulations (14 CFR) part 23, previous Civil Air Regulations (CAR) part 3, and any special light-sport category airplanes (S-LSA), experimental light-sport airplanes (E-LSA), and experimental amateur-built airplanes. The concern stems from the confusion among pilots about what an aircraft's design maneuvering speed represents, along with the misconception that any type of control input will not harm an aircraft provided its speed remains at or below V_A .

The bulletin stipulates that "the design maneuvering speed (V_A) is the speed below which you can move a single flight control, one time, to its full deflection, for one axis of airplane rotation only (pitch, roll or yaw), in smooth air, without risk of damage to the airplane."

Experimental aircraft may not have a published V_A , but pilots should be aware of the airspeed

associated with the maximum structural design loads of their aircraft. Also note that manufacturers are not required to design an aircraft able to withstand consecutive full control inputs in opposite directions, nor simultaneous full control inputs, such as full aileron with full elevator and/or rudder. The bulletin also reminds pilots to reduce V_A when operating below gross weight.

To view the SAIB, go to www.faa.gov/aircraft/safety/alerts/SAIB/ and search for [CE-11-17](#).

FCC Withdraws Ban on ELTs

In response to an FAA request, the Federal Communications Commission (FCC) on Jan. 11, 2011, issued a stay on a rule that would have prohibited the use, sale, or manufacture of 121.5 MHz Emergency Locator Transmitters (ELT). Although satellites no longer monitor ELT signals on 121.5 MHz, the FAA noted that the older signals are helpful in locating missing aircraft since the frequency is still monitored by the search and rescue community, including the Civil Air Patrol. The FAA cautioned that the current inventory of the newer 406 MHz ELTs is insufficient to replace all 121.5 MHz ELTs in the near term. The FAA said that the proposed FCC action would effectively ground a significant percentage of the general aviation fleet given that regulations require ELTs to be on board. The FAA also pointed to cost: An FAA study estimates it would take \$500 million to equip the more than 200,000 aircraft that would need the new ELTs.

In a 2010 letter to the NTSB addressing the Board's recommendation to require 406 MHz ELTs, FAA Administrator Randy Babbitt highlighted the cost burden. He noted, however, that aircraft owners have recognized the value of these devices and have voluntarily equipped more than 38,000 aircraft. Babbitt also observed that more than 9,000 pilots now carry emergency position-indicating radio beacons in their aircraft.

The FCC expects to issue a new notice of proposed rulemaking on the future of 121.5 ELTs, "following an additional opportunity for interested



parties to comment.” The FCC has not indicated a timeframe. The FAA, along with others in the aviation community, remains committed to keeping an open dialog until an agreement is reached.

WAAS Satellite Soon Back in Orbit

On Jan. 6, 2011, FAA confirmed the resumption of ground control over Intelsat’s Galaxy 15 geostationary (GEO) satellite, which hosts a Wide Area Augmentation System (WAAS) Navigation Transponder. Last spring, the satellite lost the ability to receive commands and drifted out of usable orbit shortly thereafter. Intelsat and the satellite builder, Orbital Sciences Corporation, believe they have isolated the cause of the failure and have implemented corrective actions to prevent the problem’s recurrence.

After completing diagnostic testing, Intelsat plans to move the satellite back to its original orbital location, or to another nearby position, in March 2011. With favorable testing results, the FAA expects to begin transmitting the WAAS signal in space from Galaxy 15 prior to reaching the final orbital position. The FAA plans to keep users aware of any changes that may affect WAAS service and will provide updates on its Web site (<http://gps.faa.gov>) as the situation evolves.

Update on DUI Reporting Requirements

As part of its regular outreach to the aviation community, FAA’s Security and Investigations Division is providing clarifications to a regulation on reporting requirements related to alcohol- and drug-related motor vehicle actions (MVA). The division offers the following information to provide a greater understanding of the reporting requirements as defined by Title 14 Code of Federal Regulations (14 CFR) section 61.15:

An airman has two separate reporting requirements involving alcohol-related MVAs: one report made in accordance with 14 CFR section 61.15(e), and another made to the pilot’s Aviation

Stand Up to Error, Stand Down for Safety

If you are headed to Lakeland, Fla., for this year’s Sun ‘n Fun International Fly-in and Expo, check out the 2nd Annual FAA Safety Team Standdown on April 2. You can also attend one of the more than 90 local Standdown events around the country throughout April. The April 2 event will be screened live and also archived on the FAA Safety Team Web site: www.faasafety.gov/. For more information and up-to-the-minute news on times and locations of Standdown events, go to www.faasafety.gov/Standdown/.

Medical Examiner (AME) via Application for Airman Medical (FAA Form 8500-8).

What is reportable under 14 CFR 61.15(e)?

Alcohol-related motor vehicle actions, such as suspensions, revocations (administrative actions), and convictions for offenses, such as driving while under the influence, driving while impaired, and operating under the influence. Please note suspensions/revocations *and* convictions are both reportable under this regulation even though they may be related to the same incident. These reports must be sent to the FAA’s Civil Aviation Security Division, P.O. Box 25810, Oklahoma City, OK 73125, within 60 days of an alcohol-related MVA.

What is reportable on your application for

Airman Medical, specifically question 18v?

(1) Any arrest and conviction involving driving while intoxicated/under the influence/while impaired, etc; (2) any conviction or administrative action which resulted in the denial, suspension, cancellation, or revocation of your driving privilege (Note: this is not limited to alcohol-related events); and (3) any attendance at an educational or rehabilitation program. Please remember to openly discuss details related to these events, along with any other information asked on the form, with your AME.

To address other concerns, please refer to www.faa.gov/go/duidwi or call (405) 954-4848.



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FAA Forum Schedule for SUN 'N FUN 2011

The Aviation Safety Year Starts Here

	8:30 – 9:30	10:00 – 11:00	11:30 – 12:30	1:00 – 2:00
Tuesday, March 29	Aircraft Performance <i>Walt Schamel</i> 2004 ASC of the Year	A Day in the Life of an Accident Investigator <i>Tony James</i>	FAA Team Accident Mitigation Through the WINGS Program <i>Bryan Neville</i>	FAA Team Loss of Control: Approach to Landing <i>Ernie Strange</i>
Wednesday, March 30	FAA Team Safe Use of Cockpit Technology <i>Mike Gaffney</i> 2007 CFI of the Year	Avemco We Have Met the Enemy and He Is Us <i>Jim Lauerman</i> President, Avemco	Rotax 912 Features, Operations & Service <i>Phil Lockwood</i>	Surface Safety <i>Wes Timmons</i> Director, FAA Office of Runway Safety
Thursday, March 31	Technologically Advanced Aircraft Making the Easiest Planes to Fly the Safest <i>Kerry Hackney</i>	AOPA-ASI Real World IFR <i>JJ Greenway</i>	The Kings on Practical Risk Management <i>John & Martha King</i>	FAA Team Small Unmanned Aircraft: Threat or Asset to GA <i>Al Frazier</i> UND
Friday, April 1	FAA Flight Standards "Watch Your Attitude" <i>Susan Parson</i>	Maintaining Your Medical <i>Dr. James Fraser</i> Dep. Federal Air Surgeon	AOPA-ASI Close Calls, Lessons Learned <i>JJ Greenway</i>	Meet the FAA <i>Host: Doug Murphy</i>
FAA Team Safety Standdown Stand Up to Error, Stand Down for Safety				
Saturday, April 2	8:30 Positive Flight Attitude <i>Kermit Weeks</i>	9:35 Going Beyond Preflight <i>Steve Keesey</i>	10:35 En Route Cruise: Are You on Cruise Control? <i>Barrington Irving</i>	11:35 Maneuvering Flight: Slow, Steady, Sure <i>Ernie Strange</i>
				12:30 Town Hall Meeting <i>Rep. Sam Graves (R-MO)</i>
Sunday, April 3	Aerobatics in Your Plane: Can You & Should You? <i>Steve Wolf</i>	Stall Spin Prevention <i>Diego Alfonso</i>	Bahamas Flying the Islands of the Bahamas <i>Leonard Stuart</i> <i>Greg Rolle</i>	FAA Team Flying in Florida's Airspace <i>Dennis Whitley</i>

See all these seminars LIVE at www.faaproductstudios.com or www.FAASafety.gov by clicking on the "View Safety Seminars Live" link. Seaplane Splash-In: Thu@ Fantasy of Flight / *Balloon Launch Briefing: Saturday, 6:00 a.m./ Forum Open: Daily, 8:00 a.m. / Night airshow: Friday / We will simulcast all or part of some of the presentations on Sun 'n Fun Radio 1510 & FlightLine Radio.com | Look for local programming on PGTV BH 622, Verizon 20 & Comcast 5



Look for presentations on ATN (Aviation Training Network), GETN (Government Educational Training Network) & FAN (Florida Aviation Network) on March 29,30,31 & April 1 at 12:30 Eastern. Meet the FAA will be at 1:00 Eastern on Fri Apr 1.

For updates, check <http://faaproductstudios.com>

For our year-round programs & schedule please see:

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Aeromedical Advisory

A Blinding Flash

You are enjoying the beauty and peace of a night flight. Suddenly, something catches your eye—literally. You are briefly aware of a blinding green light. Then, it seems as if you were punched in the eye. You instinctively close your eyes and try to avoid moving the flight controls in any way. The light subsides and, shaken, you land at the closest airport.

Ideally, you have not experienced this kind of close encounter with a ground-based laser pointer, but you need to be aware of this growing hazard. In 2010, the FAA received reports of more than 2,200 laser illumination incidents, up from around 300 just five years ago. California, Florida, and Texas recorded the most, but no place is immune with the widespread availability of cheap and powerful handheld laser pointers.

An FAA research team at the Civil Aerospace Medical Institute (CAMI) found that while the chances of permanent laser damage are remote, the immediate effects of laser exposure are especially debilitating when the eyes are adapted to low-level cockpit lighting. Physiological effects include glare, flash blindness, and afterimage.

Glare—when an object in the field of vision appears obscured by a bright light source located near the same line of sight.

Flash blindness—a temporary loss of vision that gradually fades after the light source has been removed.

Afterimage—a temporary image in the visual field after exposure to a bright light, like the spot of light you see after a camera flash.

The CAMI researchers noted that the distraction created by a laser illumination incident is significant and developed a list of recommended actions:

- **Anticipate**—When operating in a known or suspected laser environment, the non-flying pilot (if present) should be prepared to take control of the aircraft. Consider showing non-pilot passengers how to maintain the established flight path. Laser attacks are most frequently reported near airports, occur

between 7:00 and 11:00 p.m., and between 2,000 and 10,000 feet AGL.

- **Aviate**—Check aircraft configuration and consider engaging the autopilot (if installed) or keep the aircraft trimmed for “hands-off” control of heading and altitude.
- **Navigate**—While avoiding abrupt maneuvers, consider using the aircraft fuselage to block the laser beam by carefully climbing or turning away from the laser source.
- **Communicate**—Inform ATC with as much detail as possible, including location/direction of the beam and your location and altitude.
- **Illuminate**—Turn up cockpit lights to minimize further illumination effects.
- **Delegate**—If another crewmember has avoided exposure, consider handing over control to that person.
- **Attenuate**—Shield your eyes. Do not look directly at the laser beam and avoid drawing others’ attention to the beam.
- **Do Not Exacerbate**—Avoid rubbing your eyes.
- **Evaluate**—If visual symptoms persist after landing, see an ophthalmologist.

For more information, see “Blinded by the Light” in the [July/Aug. 2009 issue of FAA Safety Briefing](#).

Please report any in-flight laser encounters: see page 4 of AC 70-2 (www.faa.gov/regulations/policies/advisory_circulars/index.cfm/go/document.information/documentID/23081), call (202) 267-5289, or e-mail LaserReports@faa.gov.

Frederick E. Tilton, M.D., M.P.H., received an M.S. and an M.D. from the University of New Mexico and an M.P.H. from the University of Texas. During a 26-year career with the U.S. Air Force, Tilton logged more than 4,000 hours as a command pilot and senior flight surgeon flying a variety of aircraft. He currently flies the Cessna Citation 560 XL.

Fast-track Your Medical Certificate

**With FAA MedXPress, you can get your
medical certificate faster than ever before.**

Here's how: Before your appointment with your Aviation Medical Examiner (AME) simply go online to FAA MedXPress at <https://medxpress.faa.gov/> and electronically complete FAA Form 8500-8. Information entered into MedXPress is immediately transmitted to the FAA and forwarded to your AME before your medical examination.

With this online option you can complete FAA Form 8500-8 in the privacy and comfort of your home and submit it before your appointment.

The service is free and can be found at:

<https://medxpress.faa.gov/>



Ask Medical Certification



Dr. Warren S. Silberman and his staff administer the aeromedical certification program for about 600,000 holders of U.S. pilot certificates and process 450,000 medical certification applications each year.

Q: I would like to know in layman's terms the purpose of an FAA medical certificate. It seems to me the only legitimate purpose is to make it a statistically low probability that a pilot will be unable to act as pilot in command due to a medical condition.

If my assumption is true, what is the danger of a pilot flying after having a prostatectomy? What is the danger after having the seed implants? What if a pilot is diagnosed with prostate cancer and the doctor recommends monitoring only due to the slow cancer progression?

A: Under Title 14 of the Code of Federal Regulations (14 CFR) part 1, the FAA defines a medical certificate as "acceptable evidence of physical fitness on a form prescribed by the Administrator." The primary goal of the FAA's airmen medical certification program is to protect not only those who exercise the privileges of a pilot certificate but also air travelers and the general public. I do not mean to belabor this point, but pilots in the United States have been required to have medical certification to fly since 1926. The purpose of medical certification in the United States is to minimize the risk that the pilot will suffer a sudden incapacitating event while flying.

In the case of prostate cancer, the issues that the airman deals with are the discomfort that can occur with pressure in the bladder as a result of incomplete emptying and the potential spread of the cancer to the bones of the spine. When the cancer spreads to the bone it makes the bone prone to collapse. Sudden collapse of a vertebra will result in significant pain and the possibility of nerve damage and paralysis. The collapse can occur with only minimal stimulation.

There are also the issues of side effects from treatment. In the case of radiation therapy, these can include an inflammation of the rectum, the urge to urinate, and frequency of urination. These symptoms

may not be incapacitating, but are annoying and can affect a pilot's concentration.

In your last sentence, you mention monitoring, which is known as "watchful waiting." Here the treating physician will closely follow the airman with medical history, examinations, serial PSA levels, and perhaps certain x-ray studies. The FAA accepts this, but may require certain testing on a regular basis because of the concerns mentioned earlier.

The FAA has accepted all forms of treatment for prostate cancer for Authorization for Special Issuance (waiver) consideration. Once an airman has one of the forms

of treatment, he must consider himself grounded pending review by the Aerospace Medical Certification Division.

FAA policy requires the airman wait at least six weeks until he provides the FAA with a waiver request. Before the FAA will consider the request, the airman must provide the operative and pathology reports from the procedure, a current status report from the treating urologist that addresses any complications and treatment, and a current PSA level. If you have not yet provided this medical information, please do so.

Send your question to SafetyBriefing@faa.gov. We'll forward it to Dr. Silberman without your name and publish the answer in an upcoming issue.

Warren S. Silberman, D.O., M.P.H., manager of FAA's Aerospace Medical Certification Division, joined FAA in 1997 after a career in the U.S. Army Medical Corps. Dr. Silberman is Board Certified in Internal Medical and Preventive/Aerospace Medicine. A private pilot with instrument and multi-engine ratings, he holds a third-class medical certificate.

A POSITIVE FLIGHT ATTITUDE



Photos courtesy of TrinTec Industries



You have probably seen the “watch your attitude” shirt in your favorite pilot supply shop, along with its “bad attitude” evil twin. You may even have one or two in your wardrobe. Though the emblems are primarily intended as a witty way to advertise the wearer’s status as an aviator, general aviation would be a lot safer if pilots could avoid the “bad attitude” and take the “watch your attitude” reminder more seriously. As the pun implies, the need for a positive flight attitude applies not only to physical control of the airplane, but also—and perhaps more importantly—to the pilot’s attitude toward all aspects of the flight.

Be AWARE

The airplane’s physical attitude is relatively easy to understand. The pilot’s mental attitude is more complicated. Attitude can be defined as a complex mental state involving beliefs, feelings, values, and dispositions to act in certain ways. One of the trickiest aspects of mental attitude is that the beliefs, feelings, and values driving our disposition to act in certain ways are often as invisible to us as water is to a fish.

Assuming that safety is one of your primary aviation values, there *are* things you can do to become more aware of factors that contribute to a positive flight attitude in both senses of the term. These include: **Aircraft** – **Weather** – **Airspace** – **Risk Factors** – **External Pressures**.

Aircraft

For a positive flight attitude, aircraft awareness starts with the preflight inspection. The “Going Beyond Preflight” article on page 12 addresses this topic in detail, but the two basic requirements are to ensure that the aircraft you intend to fly is legally airworthy and in a condition for safe flight. To be airworthy, an aircraft must conform to its type design, which includes not only its equipment but also *documented* compliance with all required maintenance and inspections. Though it might seem logical to assume that a legally airworthy aircraft is in a condition for safe flight, the distinction is analogous to pilot health: You might be legally “airworthy” in terms of having a current pilot

medical certificate, but you are not in a condition for safe flight if, say, you had a heart attack last week or you woke up this morning with a debilitating case of the flu. While an aircraft may appear to meet all the legal/paperwork requirements for airworthiness, it is obviously not in a condition for safe flight if you find something like a significant nick in the propeller during your preflight inspection.

Another aspect of aircraft awareness is having a positive—and honest—attitude toward your ability to safely and competently fly that particular make and model. Your pilot certificate might specify “airplane single-engine land,” but the range of airplanes included in that category and class ranges from something as basic as a Piper *Cub* to a complex turboprop like the Pilatus *PC-12*. Are you legally current in the aircraft you are about to fly? Are you proficient, both in terms of the basic stick-and-rudder skills needed to keep the aircraft’s physical attitude established in a positive direction and also in terms of systems knowledge? Deficiencies in both areas have brought many pilots to grief.

Here is another way to think about it: Just as in formation flight, where two or more aircraft operate as a single flight, the pilot and the aircraft must fly as members of a team. As with any team, each member depends on the other’s competence and proficiency. The aircraft cannot compensate for the pilot’s lack of skill and the pilot cannot compensate for the aircraft’s lack of mechanical health or performance.

Weather

Understanding the concept of the pilot and aircraft as a formation team is key to a positive flight attitude toward weather awareness. Even the most capable and well-equipped aircraft can be dangerous in the hands of a pilot who does not understand—and respect—weather. Similarly, even the most weather-wise pilot must recognize that weather conditions that are safe to fly in a Cessna *Corvalis* may be perilous in a Piper *Pacer*.

The first step in weather awareness is to obtain a detailed weather briefing. Even more critical is knowing how to identify and then apply the most important pieces of information to the flight you are about to make. As you may have read in an article in the July/Aug. 2010 issue of *FAA Safety Briefing*, this task is more manageable if you remember that there are just three ways that weather affects an aviator: Weather can create wind, weather can reduce ceiling and visibility, and weather can affect aircraft performance.

To build your awareness of how weather issues will affect a given flight, you need to evaluate those conditions in terms of the specific pilot-aircraft team operating that flight:

1. Evaluate *wind* in terms of both pilot proficiency, for example crosswind skills, and aircraft capability, such as maximum demonstrated crosswind component.
2. Assuming that the aircraft is equipped for instrument flight, evaluate *reduced ceiling and visibility* in terms of not only the legal requirements for an instrument rating and the instrument currency required by 14 CFR 61.57, but also with respect to the pilot’s proficiency in basic attitude flying, instrument operating rules and procedures, and all other aspects of instrument flying.
3. When you review weather data, such as temperatures, be aware of how icing and high density altitude can reduce your aircraft’s *performance*. An aircraft is a machine and every pilot needs a rock-solid understanding of what a given flying machine can and cannot do. Even a “super pilot” faces hard limits on what a Super *Cub* can do in performance-limiting weather conditions.

Positive flight attitude applies not only to physical control of the airplane, but also to the pilot’s attitude toward all aspects of the flight.

Airspace

Even though few of us were around to actually experience the alleged “good old days” of wide open skies, most pilots I know wax lyrical about those times and grouse mightily about the proliferation of controlled and restricted airspace. Like it or not, congestion and security nevertheless drive requirements for regulating the National Airspace System.

Accordingly, a positive flight attitude for safety necessarily includes not just awareness, but also knowledge, understanding, and respect for aviation’s rules of the road. If you expect to fly in, or even near, Class B, Class C, or Class D airspace, it is a good idea to review the basic dimensions, communications, and clearance requirements for each type. Although Class E airspace does not require communication with ATC, it does include weather minimums designed to help with both VFR see-and-avoid and separation between VFR and IFR traffic operating in this airspace.



A positive flight attitude also includes meticulous attention to temporary flight restrictions (TFR). As you know, a TFR is a regulatory action that

temporarily restricts certain aircraft from operating within a defined area in order to protect persons or property in the air or on the ground. TFRs are issued

There are three ways weather affects an aviator: wind, reduced visibility, and aircraft performance.

through the Notices to Airmen (NOTAM) system, and specifically by means of a Flight Data Center (FDC) NOTAM. The regulations define several different types of TFRs, but one thing is common to them all: Since TFRs are, by definition, temporary in nature, it is extremely important to check the FDC NOTAMs before *every* flight you make—even those in familiar home airspace.

A discussion of airspace awareness is not complete without emphasizing the importance of understanding safe operations on the ground. When operating to any unfamiliar airport, especially one with a mixture of aircraft types, be sure to review the rules, practices, and procedures to avoid runway incursions and other dangerous events.

Last, but not least, airspace awareness includes knowledge of terrain and obstacles along your route of flight.

Risk Factors

Risk, the *chance* of injury, damage, or loss, is inherent in everything we do. As you may recall from “Building Blocks and Safety Circles” in the Jan./Feb. 2011 issue of *FAA Safety Briefing*, risk arises from hazards, which can be defined as any *source* of potential injury, damage, or loss. It stands to reason that your awareness of the hazards affecting various aspects of your flight is key to minimizing risk to persons (pilot, passengers, people on the ground) and property (aircraft, structures on the ground).

As explained in the FAA’s *Risk Management Handbook* (FAA-H-8083-2), the PAVE checklist is a methodical way to increase your awareness of hazards that might pose a risk for your flight:

- **P** – Although the “P” is primarily intended to spur thinking about hazards associated with the pilot (fatigue, illness, stress, lack of proficiency), it can also represent hazards that might arise from passengers, e.g., distraction to pilot.
- **A** – Use this part of the PAVE checklist to identify hazards related to the aircraft you are flying. Does it have known mechanical issues?
- **V** – Derived from “enVironment,” this part of the checklist reminds you to identify hazards arising from weather, airspace, terrain, and airports.
- **E** – External pressures (discussed below) often pose the most insidious dangers to a pilot. Awareness of these pressures is vital to safety of flight.


External Pressures

I speak from personal experience when I say that external pressures can pose the greatest hazard to safety awareness and, as the definition for attitude states, the “disposition to act in certain ways.” A pilot who recognizes a hazard will likely have the disposition to act in a safety-conscious manner. When a hazard goes unnoticed, however, the pilot may instead be disposed to act in ways that, if an accident occurs, inspire fellow aviators to roll their eyes over the “stupidity” of his or her behavior. Because they often arise from those unconscious but powerful beliefs, feelings, and values that we all hold, external pressures can have truly treacherous effects on pilot judgment.

My personal examples include several episodes that, had they ended badly, would have caused my fellow fliers to wonder how I could have been so dumb:

- I nearly had a continued VFR-into-IMC encounter in mountainous terrain. I came to my senses and reversed course when I realized that a subconscious reluctance to worry relatives waiting at the intended destination airport was pushing me to take unnecessary chances.
- In my excitement over passing a check ride taken at a distant airport, I forgot to check the fuel level before departing for the triumphant flight home. With darkness approaching and fatigue encroaching, I nearly succumbed to the idea that I could “probably” make it home on the fuel I had. The thought of having to explain that line of thinking after a fuel exhaustion accident prompted a much-needed fuel stop.
- A long-anticipated plan for a \$100-hamburger dinner at a popular airport restaurant with two fellow pilots created unconscious pressures on all of us. In our eagerness to execute the plan, we nearly talked ourselves into a marginal VFR night flight without being certain how much fuel was aboard. We realized what we were doing, secured the Cessna, and drove downtown instead.

Eternal Vigilance is the Price...

To paraphrase a famous quotation, eternal vigilance is the price of freedom from aviation accidents. I think we can all agree that it is a price well worth paying. 

Susan Parson is a special assistant in the FAA Flight Standards Service and editor of FAA Safety Briefing. She is an active general aviation pilot and flight instructor.

For More Information

FAA Risk Management Handbook (FAA-H-8083-2)

www.faa.gov/library/manuals/aviation/media/FAA-H-8083-2.pdf



Calling All Mechanics

Keep Informed with FAA's Aviation Maintenance Alerts

Aviation Maintenance Alerts (Advisory Circular 43.16A) provide a communication channel to share information on aviation service experiences. Prepared monthly, they are based on information FAA receives from people who operate and maintain civil aeronautical products.

The *Alerts*, which provide notice of conditions reported via a Malfunction or Defect Report or a Service Difficulty Report (SDR), help improve aeronautical product durability, reliability, and safety.

Recent alerts cover:

- electrical power failure on the Piper PA31-350
- stuck starter contactor on the Cessna 172M
- stretched cylinder studs on the Continental IO-360-G2B engine

Check out Aviation Maintenance Alerts at:

www.faa.gov/aircraft/safety/alerts/aviation_maintenance/

To submit an SDR, go to:

<http://av-info.faa.gov/sdrx/>

TOM HOFFMANN

Going Beyond

Preflight



Tips for Perfecting Your Preflight Inspection

On the evening of July 12, 2002, a pilot operating a Piper *Warrior II* departed Wiley Post airport (KPWA) in Bethany, Okla., to McKinney, Texas, to pick up a friend's family and head back to KPWA. During the return leg, the pilot and his passengers—a mother, her 5-year old son, and 14-year old daughter—experienced what many pilots only have nightmares about: an in-flight fire. The passengers first realized there was a problem when they noticed a burning smell and excessive heat coming from beneath the aircraft's backseat. A fire broke out minutes later, filling the small airplane cabin with smoke and flames. Calm nerves, quick thinking, and properly executed emergency procedures saved the day as the pilot safely landed the smoldering plane on a nearby interstate highway and all aboard exited without injuries. However, as was discovered in the ensuing investigation, the pilot was unaware of a missing item required by an airworthiness directive (AD), which, if caught during preflight, would likely have avoided such grave danger.

For many pilots, the preflight inspection cliché of “kick the tires and light the fires” is difficult to shake. Then, there is the strong tendency to fall victim to complacency, especially when dealing with an aircraft you fly all the time. Consider this: NTSB aviation accident data show that in the last 10 years, poor preflight inspections caused or contributed to 156 general aviation accidents and resulted in 41 fatalities. As these pilots, including the pilot of the Piper described above, have discovered, a good preflight can be the difference between a safe flight and quite possibly your last flight. Let's have a look at how you can hone your inspection skills and go above and beyond a routine preflight.

Read Between the Lines

Every good preflight starts with a basic, yet valuable tool: a checklist. Given the multitude of aircraft types and the variations of all you can see and feel during a preflight, a checklist is an excellent resource for ensuring you follow a reliable workflow

Photo by Susan Parson

and cover all the required inspection items for your aircraft. But, there is a lot more to a preflight than checking items off a list.

“Not everything you need to look for is spelled out nicely on a checklist,” says Steve Keeseey, FAA airworthiness safety inspector. “A good pilot knows there are several items ‘between the lines’ that are equally important during a preflight.” One such item, often accomplished before even seeing the aircraft, is ensuring its airworthiness from a records perspective. The *Nuts, Bolts, and Electrons* article on page 28 offers more on this subject, but a task worth mentioning here is the AD compliance check.

Had the pilot in the in-flight fire scenario known how easy it is to determine that an aircraft is out of compliance with an AD requirement, he and his passengers would have been spared the onboard fireworks. In this case, the culprit was a missing piece of plywood between the battery and the springs under the backseat. The plywood was required by a one-time AD in 1982 and compliance could easily be verified by just lifting the backseat. Without the plywood, the seat springs and the battery terminals made contact, shorted, and caused the fire. The plywood was removed during one of two interior modifications, which took the Piper out of compliance with this AD, and the missing plywood was never discovered or corrected during subsequent annual or preflight inspections.

While not all ADs cover items that are easily visible or obtainable during a preflight, be sure to include those that are during your inspection. A good example of AD compliance that is easy to verify but not included on the manufacturer’s checklist is the seat-track installation on many Cessna models. During preflight, look for excessive wear across the seat-track holes and for proper operation of the lock pins that keep the chair in place. AD 87-20-03 R2 contains more information on this important check.

Finding information on ADs applicable to your make and model aircraft is easy—just click the AD link from www.faa.gov. You can search by make, appliance, product, or AD number. You can also glean helpful tips on AD awareness by getting involved with your local type club or by simply asking an AMT or owner of a similar type aircraft.

Let’s Go For a Walk

Learning the importance of a quality preflight inspection is something engrained in a pilot’s basic skill set from day one. Some student pilots may get overwhelmed by all the tugging, pushing, pulling, and jiggling going on during a walk-around inspection, especially with certain aircraft systems that can seem foreign to a beginner. However, your flight instructor should be there to help you understand what you are checking and help take the mystery out of the process.

“It’s easy to go through all the motions of a preflight without really knowing what you’re doing,” says FAA Aviation Safety Analyst Barry Hyde, who recalls his years as a passionate advocate for sound preflight checks during his time as a flight instructor. “One thing I always stressed to my students was to be as familiar as possible with all the aircraft’s components and systems. The more you know about how certain parts operate and interact with each other, the better you’ll be at knowing what to look for during preflight and how to handle an emergency in flight.”

When preflighting an aircraft, whether it is for the first or the thousandth time, ask yourself some basic questions about what you are looking for and how the item you are inspecting could affect your flight. For example, you may strain fuel from your aircraft and get a clean sample every time. But, have you ever seen exactly what the fuel would look like mixed with water and/or contaminants? And, what if



This Piper fire had a safe outcome (see article), but stands as an important reminder to verify AD compliance before your flight.

Photos by John D. Montgomery



Photos by Susan Parson

some Jet A or AVGAS 80 or 100 somehow wound up in your fuel tanks? Would you know how to detect it? How do you know you would not mistakenly overlook something you checked without incident a hundred times before? NTSB data show dozens of recent cases where improperly checked fuel led to a tragic result.

Another important item to consider is the life-blood of your aircraft: the engine oil. A preflight should always include a look at the quantity and condition of oil in your engine. Even if the oil looks fresh, it is still a good idea to note the last time it was changed. The cooling and lubrication properties of oil can degrade if it sits for a long period of time. Also, if you find yourself having to regularly add oil, or notice the level dropping, your aircraft may have a leak somewhere. Check for signs of oil in and around the engine compartment and study the ground beneath where you regularly park for any unusual stains or spots.

Don't forget to replace and tighten the oil filler cap after an inspection. The pilot of a Cessna 182 forgot to do just that on May 12, 2007, resulting in a fatal accident. Data from the investigation of that accident suggest that oil escaping the engine through a loose oil filler cap obstructed the aircraft's windshield and may have caused the pilot to impact the ground during a landing attempt.



Preflight Highlighted at Safety Standdown

If you are headed to the Sun 'n Fun International Fly-in and Expo this year in Lakeland, Fla., be sure to check out the "Going Beyond Preflight" seminar presented as part of the FAA Safety Team's 2nd Annual Safety Standdown (also at various locations nationwide—see www.faasafety.gov/Standdown/ or your local FAA Safety Team rep for details). The presentation will offer more details on what to look for during your next preflight, whether it's how to spot worn, broken, or loose components, or how to verify if your airplane complies with all the necessary inspection and AD requirements.

Where the Rubber Meets the Runway

Anyone who notices the long black streaks at the approach end of a runway can appreciate the brutal forces aircraft tires endure during the transition from being airborne to earthbound. Exposed to a regular mix of temperature extremes, pressure changes, and powerful friction forces, aircraft tires definitely require special attention during a preflight.

For instance, do you know how much tire wear warrants a replacement? If you can see the casing fabric or notice any large bulges, cuts, or cracks, you know it is time for a tire change. How about the last time you checked the air pressure? Do you know what the acceptable pressure is and the best time to check? In some cases, it could take hours for an aircraft tire to cool to the ambient temperature after a flight. Uneven wear on a tire could also mean your aircraft is trying to tell you something: The tires could be over- or underinflated, or there could be a problem with gear alignment. When in doubt, have an AMT check it out.

What's Your Type?

Another overlooked area during a preflight inspection is recognizing the differences between aircraft types. For example, pilots who fly a high-wing Cessna 152 may find it a lot harder to crouch down and inspect flap hinges or sump fuel on a low-wing Piper *Cherokee*. A low-wing aircraft also has a greater tendency for wing or flap damage, such as that caused by someone standing on a no-step area, to go unnoticed.

Even among similar manufacturers there can be big differences—a Cessna 172 could have as few as three or as many as 13 places to drain and inspect fuel. That could prove crucial to a pilot who rents an aircraft and skips over unfamiliar fuel strainer locations.

While it would be impossible to cover the almost infinite number of maintenance "gotchas" and scenarios you might encounter during a preflight, I hope this article has piqued your curiosity about

aircraft systems and the items you routinely check during a preflight but may take for granted.

As acting Assistant National FAA Team Manager Phil Randall points out, it is more than just knowing your aircraft that prevents mistakes, it is knowing how to properly follow through and execute that knowledge that makes the difference in a quality preflight.

“Sometimes just the sheer repetition of an inspection task—even with an aircraft you know inside and out—could lead you to miss a problem that is staring you right in the face,” says Randall. “By taking your time and by mentally reviewing each item you check, you will have a much better chance of catching something unexpected.”

Case in point: We have all heard—often with disbelief—about pilots who become statistics because of something as obvious as forgetting to remove a control lock before takeoff. These are tragic reminders of how distractions and complacency can creep into even the most steadfast safety routine and wreak havoc.

On your next flight, make it a point not to speed through your preflight checklist. Instead, take the time to know exactly what it is you are checking

Preflight Knowledge Check

Question:

When does an aircraft’s airworthiness certificate expire?

Answer:

It does not expire, provided it remains within the guidelines established for its approved type design, is in a condition for safe operation, and maintenance, preventive maintenance, and alterations are performed in accordance with 14 CFR parts 21, 43, and 91.


and why you are checking it. Learning to challenge yourself to go above and beyond your preflight will make you a wiser and safer pilot. ✈️

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

For More Information

Check out the AOPA/Air Safety Institute Aircraft Preflight Safety Quiz with a free account at

www.aopa.org/asf/osc/loginform.cfm



Among the critical steps of a proper aircraft preflight, shown here and on page 14, include checking the fuel (p. 14, l), inspecting the engine compartment (p. 14, r), checking the oil (top), and checking the condition of the flight controls (l and r).

JAMES WILLIAMS

Cruise Control:

Avoiding VFR into IMC

It's not a perfect weather day—those are truly rare—but conditions are comfortably above both legal and personal minimums for the VFR cross-country flight you and a friend are making to visit her family in another state. The weather at your destination is currently reported as IFR but forecast to improve to VFR an hour before your estimated time of arrival. You climb to altitude, trim for cruise flight, and settle in for a casual catch-up conversation with your passenger. Because you are expecting VFR conditions, you are not initially troubled by the decreasing visibility. To the extent you even notice, you dismiss it as the haze typical for this time of year.

As the flight continues, you begin to develop that queasy and uneasy feeling that something is not quite right. Not wishing to alarm (or disappoint) your passenger, you keep talking and you keep flying even though you are now consciously straining to see through the haze.

Photo by Adrian Eichhorn

Then you notice that the engine sounds different. A glance at the instrument panel puts you in a state of shock and bewilderment: Your senses say you are still in steady straight-and-level flight, but the instruments and the engine noise insist that the airplane is now in a diving turn to the left. Confused, you freeze. This cruise is now out of control. As for what happens next...?

The Myth of Missing Information

If any part of this story strikes a chord of recognition, you are among the lucky ones. VFR flight into instrument meteorological conditions (IMC) is one of the leading causes of fatal GA accidents. Of the 21 such accidents included in the AOPA Air Safety Institute's 2009 Nall Report, 18 were fatal. And, sadly, the problem is not new. A review of 1999-2008 NTSB accident files shows 160 VFR-into-IMC accidents (Fig. 1). Of these, 139 were fatal, resulting in 276 deaths.

The persistence of this deadly problem accounts for its selection as one of the four focus areas for this year's FAASafety Standdown. We will talk about tips for keeping yourself out of the Nall and NTSB statistics, but first let us dispose of the commonly-held notion that VFR-into-IMC accidents will vanish if pilots *just* have that one missing piece of information or training.

Pilots Just Need Better, More Timely Weather Information

There is no question that pilots need quality weather data to avoid VFR-into-IMC, but it is not enough to just get a weather briefing. In more than 50 percent of the VFR-into-IMC accidents we found in the NTSB files, the pilot *did* get a weather briefing. The real question is what the pilot did *with* the weather briefing. Did he or she understand its implications? Or, as humans so often do, did the pilot let wishful thinking cloud his or her judgment?

Many of us turn to technology as the solution to our weather woes. If only we had more timely information, we say, we could see and avoid bad weather. In that respect, weather data link seems like a silver bullet solution. Reality is more complicated. Among other things, the kind of weather that data link is most likely to see is not necessarily the same kind of weather that baits the VFR-into-IMC trap. If we are flying VFR, most of us know not to plow into convective clouds of the sort we can easily see with our eyes as well as via data link. Weather avoidance technology is far less able to detect conditions such

as haze that is thick enough to create IFR conditions.

Pilots Just Need More Training

Training certainly helps; in fact, we called it "The Cheapest Insurance" in a March/April 2008 *FAA Safety Briefing* article (<http://go.usa.gov/rju>).

Still, the facts show that acquisition of an instrument rating does not coat the pilot in protective Teflon®. In

nearly half (47 percent) of the VFR-into-IMC accidents we reviewed in the NTSB data, the pilot was instrument rated.

Ah, you say, that is not enough. Was the pilot both legally current and instrument proficient? Good questions—and you are correct in noting that a competent instrument pilot needs all three characteristics. Being instrument-rated and current are both legally necessary, and both are intended to promote proficiency. Regular practice of correct techniques promotes and preserves proficiency.

We do not know for certain whether some of the instrument-rated VFR-into-IMC accident pilots were both legally current and genuinely proficient.

VFR flight into instrument meteorological conditions (IMC) is still one of the leading causes of fatal GA accidents.



Photo by Susan Parson

VFR-into-IMC accidents, 1999-2008

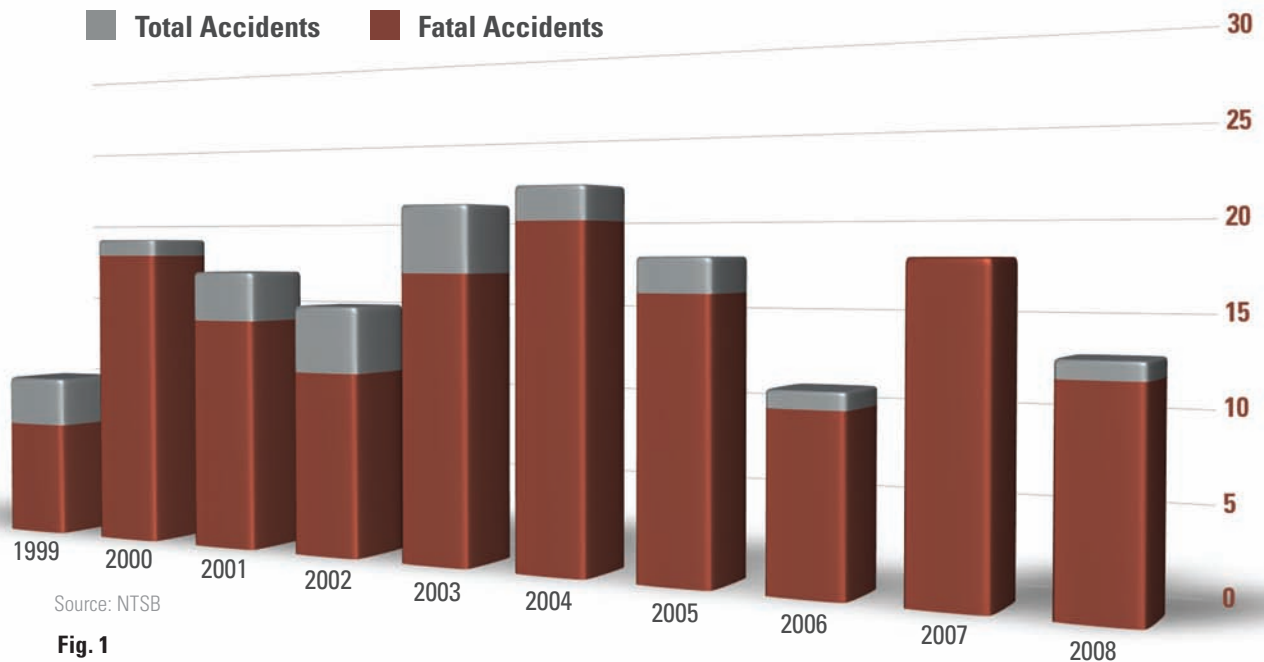


Fig. 1

But even if they were, those characteristics may not have been enough to keep them out of trouble. An instrument-rated pilot who files an IFR flight plan and expects to fly in the clouds initiates

and conducts the flight with that expectation and thus with the behaviors appropriate to IFR flight.

On the other hand, an instrument-rated pilot who plans and expects a VFR flight may be as surprised as a non-IFR rated pilot if there is an inadvertent encounter with IMC.

Be mindful of how deceptive gradual changes can be.

What You Can Do

Pay attention. As the opening scenario illustrates, complacency can kill. Look around and make sure you actually *see* when you look outside. Be mindful of how deceptive gradual changes can be. If you get the queasy, something-is-not-right feeling, pay heed and figure out why you feel that way.

Use personal minimums. Legal minimums may not match up with your personal capabilities and comfort level. Check out “Getting the Maximum from Personal Minimums” (*FAA Safety Briefing*, May/June 2006 at <http://go.usa.gov/rSP>) for step-by-step guidance on developing individual personal minimums tailored to your specific level of training, experience, and skill. Once you establish personal minimums, stick to them.

Ask questions. Ask yourself a constant stream of questions: Is the weather I actually see better or worse than forecast? Are conditions better

or worse than I expected them to be? Do I see trends toward improvement or deterioration? This technique will help you maintain awareness of gradual changes that can otherwise lure you toward a VFR-into-IMC situation.

Act on the facts. Avoid assumptions. If you find yourself using the word “probably” in connection with any part of your flight (“we can probably keep going...”), it is *definitely* time to refocus on facts.

Think like a pro. Follow these tips, and take your PIC responsibilities to heart. ✈️

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

For More Information

FAA General Aviation Pilot's Weather Guide

www.hf.faa.gov/WeatherDecisionGuide/default.aspx

AOPA's Weather Wise: Ceiling and Visibility and Accident Case Study: VFR into IMC online courses

Log into AOPA Online Interactive Safety Courses at www.aopa.org/asf/online_courses/

FAA's Risk Management Handbook, Chapter 8: Risk Management Training

www.faasafety.gov/files/gslac/courses/content/62/740/FAA-H-8083-2.pdf

FAA Safety Briefing issue on weather, July/Aug. 2010

www.faa.gov/news/safety_briefing/2010/media/julaug2010.pdf

Checklist

On Being the Best

“There’s no such thing as a natural-born pilot.”

So said legendary pilot Chuck Yeager. He should know. According to the *Huntington Quarterly* (Winter 1998), Yeager initially struggled with airsickness, but he was determined not only to be a pilot, but to be the best:

Yeager’s passion was obvious and he flew incessantly throughout flight training, getting his hands on every airplane on base at all times of the day and night. When he wasn’t flying, he was studying every aspect of every plane, down to the last nut and bolt. And when he wasn’t near an airplane, he was either waxing poetic about them at the local watering hole or dreaming about them in his bunk.

While we cannot all reach the lofty heights Yeager did, we can all strive to be the best. One clear way is to stand up for safety—the theme of this year’s FAASafety Team Safety Standdown—by developing and improving our pilot skills. An advantage today’s pilots have over those of Yeager’s generation is the wide range of aviation safety information and tools available to help you be the best and safest pilot you can possibly be.

Putting WINGS on Your Dreams

“GA pilots must develop an ongoing, recurrent training program to maintain their skills and establish a high level of safety,” says Kevin Clover, acting national FAASafety Team manager. “The WINGS program offers an easy way to do this and is an important safety tool.”

The FAA’s free online WINGS Pilot Proficiency Program is available through www.FAASafety.gov. The objective of WINGS is to address the primary accident causal factors that continue to plague the general aviation community. It is based on the premise that pilots who maintain currency and proficiency in the basics of flight will benefit from a safer and more enjoyable flying experience. Accordingly, it outlines requirements for each aircraft category and class, and includes subjects

and flight maneuvers appropriate to pilots operating those aircraft.

Here’s how it works. Once you have an account on FAASafety.gov, you complete your personal WINGS profile and select the category and class of aircraft you

will use in the WINGS Program. The FAASafety.

WINGS Pilot Proficiency Program

www.faasafety.gov/WINGS/pub/learn_more.aspx

gov WINGS section (called My WINGS) will guide you to the education and training curriculum suitable for your individual flight requirements. The program outlines the subject areas you need to study through online courses, seminars, or webinars, and it specifies the level of flight proficiency in the Practical Test Standards (PTS) Areas of Operation that correspond to the leading causal factors in accidents, sorted by category and class of aircraft.

Importantly, the WINGS Pilot Proficiency Program offers GA pilots a structured recurrent training program tailored to an individual’s specific needs. In recognition of the program’s safety benefits, the FAA agrees

that a pilot who completes a phase of WINGS satisfies the regulatory requirement for

The WINGS Pilot Proficiency Program offers GA pilots a structured recurrent training program tailored to an individual’s specific needs.

a flight review. Ongoing training to maintain WINGS currency at the Basic Level or higher means that you will always have a current flight review. Your flight review is documented in your WINGS profile on FAASafety.gov and the program reminds you when currency requirements are due.

If you are not already participating in WINGS, start your 2011 flying season by learning and growing into your very own WINGS!

Susan Parson is a Special Assistant in the FAA’s Flight Standards Service and editor of FAA Safety Briefing. She is an active general aviation pilot and flight instructor.

Slow Steady Sure



Photos by Tom Hoffmann



Avoiding Loss of Control in Maneuvering Flight

Pilot lore is replete with reminders about the importance of airspeed. We hear “speed is life.” Instructors chant a “watch your airspeed” mantra. Comedians quip that flying requires only two things: airspeed (there it is again) and money. Airspeed is a frequent topic because sufficient airspeed is essential to generating the lift needed to establish and maintain flight. We also hear about airspeed for tragic reasons: Loss of control in maneuvering flight, the number one cause of fatal general aviation accidents, often results from inattention to airspeed.

Maneuvering flight is one of the four topic areas for the 2nd Annual FAASTeam Safety Standdown. This year’s standdown includes an event on April 2 in conjunction with the Sun ‘n Fun International Fly-in and Expo, more than 90 events around the country during the month of April, and special material on www.FAASafety.gov starting on April 2. Here are some basic airspeed awareness points as background for Safety Standdown.

Knowledge: Lift, Load, and Speed

When it comes to maneuvering flight, what you don’t know *can* hurt. Sound knowledge of basic aerodynamic principles, including a grasp of why airspeed is so important, is an essential foundation

for avoiding loss of control in maneuvering flight.

To begin with, maintaining control of an airplane during flight requires maintaining lift. Lift is produced by the dynamic effect of air—in effect, airspeed—acting on the airfoil, or wing. The pilot controls lift by controlling airspeed and the angle of attack (AOA), which is the acute angle formed between the wing’s chord line and the relative wind, that is, the direction of the air striking the wing.

The pilot also controls lift by controlling the speed and direction of the relative wind. Lift is proportional to the square of the aircraft’s velocity (speed), so doubling the speed will quadruple the lift. Pilots learn that for every AOA there is a corresponding airspeed required to maintain altitude in steady, unaccelerated flight. An airplane flying at a higher airspeed can maintain level flight with a lower AOA, while the same airplane flying at a slower airspeed must have a higher AOA to generate enough lift for level flight. The curriculum for primary flight training includes airspeed change maneuvers designed to demonstrate this relationship.

Student pilots learn that there are limits at both ends of the lift-velocity continuum. At the upper end, the amount of thrust produced at full throttle limits the pilot’s ability to increase lift by increasing airspeed. At the lower end, the ability

to increase lift by increasing AOA is limited by the wing's critical angle of attack. As you recall from ground school and from practicing aerodynamic stall entries and recoveries, increasing the AOA increases lift until the wing reaches the maximum (critical) AOA. Increasing AOA beyond this point results in a large loss of lift, an increase in drag, and a wing said to be stalled.

It is crucial to remember that airspeed is not the only consideration in loss of control from an aerodynamic stall. As discussed in the [March/April 2010 issue](#) of *FAA Safety Briefing* (“Getting it Right in Maneuvering Flight”), the pilot must also consider the impact of physical weight and aerodynamic weight (load) on the airplane.

This point is especially important for pilots of airplanes with high wing loading, a value derived from dividing the loaded weight of the airplane by the area of the wing. Engineers use wing loading as a measure of an airplane's basic maneuvering performance because the greater the velocity (airspeed), the more lift is generated by each square foot of wing area. A slower airplane with a large wing area (low wing loading) will be able to generate more lift at any given speed. A faster airplane can use high wing loading to generate the same amount of lift with a smaller wing. The trade-off comes in the form of higher take-off and landing speeds and decreased maneuverability, especially at lower airspeeds. Pilots who own or fly some of today's fastest GA aircraft—including experimental and amateur-built models—need to have rock-solid knowledge of these principles.

Skill: Aeronautical Tune-up

Knowledge is the foundation, but skill is the structural scaffolding for safety in maneuvering flight. You may have thought your instructor was cruel when he/she made you practice maneuvering at minimum controllable airspeed (slow flight),

followed by aerodynamic stall entries and recoveries from both takeoff (power on) and landing (power off) configurations. However, your instructor was merely trying to develop and strengthen your ability to maintain control in all phases of flight.

No matter how much you study maneuvering flight and airspeed control, the only way to develop the actual skill is to get into the airplane and practice to proficiency. To start your maneuvering flight skill tune-up, grab or download a copy of the FAA's *Airplane Flying Handbook* ([FAA-H-8083-3A](#)) and review Chapter 4, “Slow Flight, Stalls, and Spins.”

If you do not feel proficient enough to practice on your own, hire a flight instructor to help you remove the rust. Ask to start with a review of the airspeed changes exercise from the private pilot training syllabus. A few minutes of practice will strengthen your airspeed perceptions, insights, and flying skills. Your maneuvering skill tune-up should also include practice in recovering from unusual attitudes, which can easily develop from loss of control.

Attitude: Focus, Focus, Focus

Now, more than ever, many of us operate in multi-tasking mode. Multi-tasking is an inescapable part of life and pervades aviation as well. It is both necessary and appropriate in some phases of

The only way to develop the actual skill is to get into the airplane and practice to proficiency.



Photo by Tom Hoffmann



Photo by James Williams

flight, but dangerous in others. Maneuvering flight, especially operations that require flight in the lower range of the airspeed indicator, is one phase of flight that deserves your full attention. A few tips:

Priorities. Remember that the iron law of aeronautical priorities is *aviate, navigate, communicate*. The slower you go, the more you should narrow your focus to priority number one: Flying the airplane.

Distractions. When engaged in maneuvering flight, especially the takeoff–initial climb and


approach–descent–landing phases, do everything you can to minimize distractions from every source. If you have passengers aboard,

Sufficient airspeed is essential to generating the lift needed to establish and maintain flight.

explain sterile cockpit practices during the preflight briefing and again when you conduct the pre-landing briefing. Even if you are alone, it is a good idea to self-brief. Verbally reviewing sterile cockpit procedures can help you establish the focused, no-nonsense mindset you need for critical phases of flight.

Briefings & Checklists. Be meticulous in reviewing critical requirements, procedures, and

numbers before you need to use them. Maintain the habit of self-briefings or, if you regularly fly with another pilot or a savvy non-pilot, develop standard operating procedures for conducting operational briefings and running checklists.

And, always watch your airspeed! 

Susan Parson is a special assistant in the FAA Flight Standards Service and editor of FAA Safety Briefing. She is an active general aviation pilot and flight instructor.

For More Information

Airplane Flying Handbook (FAA-H-8083-3A)

www.faa.gov/library/manuals/aircraft/airplane_handbook/

“Maneuvering: Approach and Landing” course on FAASafety.gov (requires FAASafety.gov account login and password)

https://www.faasafety.gov/gslac/ALC/course_content.aspx?pf=1&preview=true&CID=34

FAA Safety Briefing, March/April 2010

www.faa.gov/news/safety_briefing/2010/media/MarApr2010.pdf

BOB STEGEMAN

HANDLE WITH CARE

Avoiding Accidents at an Accident Scene

We hope you will never have reason to use the information in this article, but life has a way of presenting us with unlikely situations. As several bystanders in the tragic Tucson shootings discovered, knowing a few basics can make a big difference in such situations. We present this article in that spirit.

– Susan Parson, Editor

Fortunately, the likelihood of encountering an aircraft accident is slim. Still, there are enough aircraft accidents to make it a good idea for anyone engaged in aviation to be aware of hazards that can exist at an accident scene.

Pilots learn that their priorities are to aviate, navigate, and communicate. Professional first responders have their own set of priorities, which can also guide the actions of an aviator who witnesses or happens upon an aircraft accident. The three priorities for professional first responders are: Remove persons who are injured or trapped, protect the wreckage from further damage, and protect the public from injury. Let us look at a modified version of these priorities as they apply to someone who witnesses or happens upon an aircraft accident.

Summon Help

Before you consider plunging into the scene, call 911 and summon qualified first responders. Then, give first responders as much information as

you can about the accident and the site, recognizing that each airplane accident is different. Here are a few basic tips on the kind of information that first responders might need.

Is it burning? Even if the wreckage is not burning right now, the possibility of fire is high and you have to assume there was fuel on board.

What kind of airplane? Was it fixed-wing or rotorcraft? Single-engine or twin? Could it have been equipped with a ballistic parachute system? If so, did the parachute deploy?

What was it doing? Pilots use aircraft for different jobs. The kind of operation, if known, provides important information on how to safely approach the accident site. It also lets first responders know what equipment they might need. For example, an agricultural aircraft may carry hundreds of pounds of pesticide. An EMS helicopter may have large oxygen bottles on board. Weapons and ammunition may be aboard a law enforcement aircraft.

aircraft have a wide range of latching mechanisms. Aircraft handles that lay flat (flush) on the aircraft skin may be more complicated to find and operate. Attempting access through the windshield is not a good idea, because many are built to withstand significant impact.

Biohazards. Remember that biohazards may be present from occupants or from cargo, and the accident impact could spread these hazards over a large area. Take self protection seriously. Investigators wear impermeable suits with hoods, goggles, rubber gloves under leather gloves, and rubber boots. Professional first responders also take recurrent blood-borne pathogen awareness courses.

Cabin. Use caution in the cabin. Limit contact with all aircraft controls and switches, and be sure not to pull or disturb any big red T-handles for BPS. When you reach the occupants, follow basic first aid guidance. Unless there is an imminent threat, like fire, do not attempt to move an injured person on your own.

Stored-Energy Components. There are a number of stored-energy components on aircraft that can injure you. Most newer aircraft and many retrofitted older aircraft are equipped with air bags installed in the seatbelt straps. You can identify them by the very thick straps. If the air bags were not deployed in the accident, keep in mind that they are powered by compressed gas of at least 6,000 psi. There could also be energy remaining in hydraulic systems, pneumatic systems, suspension struts, wheels, and batteries. If components in these systems were compromised in an accident, they could fracture or explode if disturbed. Finally, stay clear of engine components such as propellers, inlets, exhausts, and the area directly perpendicular to the rotating parts.

Protect the Wreckage

The next priority is to protect the wreckage. An aircraft accident attracts attention; attention brings crowds. Law enforcement is responsible for securing the accident scene, but you can assist before they arrive by doing what you can to keep bystanders out after initial aid and/or rescue.

Every aircraft accident is subject to federal investigation. Do whatever is necessary to aid survivors, but do not touch, disturb, or move anything beyond what is necessary for rescue. Wreckage and ground scarring may be spread out over a large area. If you (or others) drive to the scene for rescue purposes, try to minimize the impact of your presence to avoid disturbing vital evidence. If



possible, you should photograph or document any disturbance to the scene.

Make sure to share any safety-related information from the accident with the first responders or investigators.

Specifically, be prepared to debrief the investigators when they arrive about what you saw. Include location(s) and condition(s) of wreckage, as well as noted hazards, such as air bags, BPS, or spilled fuel. When you leave, try to use the same path that you took on entry to minimize compromising the scene.

Set the example: If you cannot render aid, back away and do your best to keep other bystanders out.

Protect the Public

It should be clear that many serious hazards exist at an accident scene. Protecting the wreckage from disturbance or further damage, one of the first responders' top priorities, also helps protect the public. As a member of the aviation community, part of your responsibility if you cannot render aid is to set the example: Back away, stay away, and do your best to keep other bystanders out.

Before you consider plunging into the scene, call 911 and summon qualified first responders.

I hope you never witness an accident and that you never become involved in one. If you do, however, a little knowledge, awareness, and common sense will help you help others without harming yourself. ✈️

Bob Stegeman is an aircraft structures engineer with the FAA Small Airplane Directorate in Kansas City. He has held similar positions in the airline industry. During his aviation career, Stegeman has participated in several aircraft accident investigations and accident-related design reviews.

For More Information

For more in-depth exploration of safety at an accident scene, access the FAA's "First Responder Safety at a Small Aircraft or Helicopter Accident" training modules www.faa.gov/aircraft/gen_av/first_responders/

Developed by the FAA's Small Airplane and Rotorcraft directorates, each module focuses on a different aspect of aircraft accident hazards.

Bonanza Pilot

Takes Safety Passion to Safety Board



Photos courtesy of Earl Weener

Earl F. Weener is a man on a mission. Appointed in June 2010 to the National Transportation Safety Board's (NTSB) five-member board, Weener told *FAA Safety Briefing* that by the time his term ends on Dec. 31, 2015, he wants to see a stronger and safer GA community.

"By that time, I want to know that general aviation is alive and well and growing," Weener says. "And I want to see the accident rate diminishing." His goal: Reduce the number of annual GA fatalities by at least half by 2015 compared with 2009, or down from 475 to 237, or fewer, fatalities.

Weener knows what he is talking about—about the GA community and about aviation safety. He is an active Bonanza pilot, who first soloed in 1966, got his commercial pilot certificate in 1967, his

IFR rating in early 1968, flew as an air taxi pilot, and has been a flight instructor since 1967. "I only stopped instructing in June 2010

since stopping was a White House requirement to become an NTSB member," Weener explains.

Instruction is what got Weener started on his career in aviation safety. "Very early on, as a GA flight instructor, I realized that in teaching someone to fly more effort must be spent on developing good safety judgment than on developing the manual control skills necessary to physically fly an airplane."

Joining the NTSB was something Weener had one way or another been working toward since that Holland, Mich., Cessna 172 solo flight in 1966. In

1975, Weener took his newly minted University of Michigan doctorate in aeronautical engineering to the Boeing Company where he worked on improving aviation safety for nearly a quarter of a century. Early assignments included helping develop the first advanced-technology glass flight-crew interface on the Boeing 767 and 757 flight decks and modifications to transition the 747 to a modern two-crew flight deck.

After a 4-year stint in Washington, D.C. as Boeing's manager of engineering and technology government affairs, Weener became chief engineer for Airworthiness, Reliability, Maintainability, and Airplane Safety. In that role, he led the global effort to prevent controlled flight into terrain (CFIT) accidents as well as approach and landing accident reduction (ALAR). After retiring from Boeing as chief engineer for Airplane Safety Technology Development, Weener became a Fellow of the Flight Safety Foundation where he continued his CFIT work and led ground accident and runway excursion safety initiatives.

Yet, he was never far from GA. In 2004, he and his wife, Linda, purchased their Bonanza and Weener instructed in the Portland, Ore., area. It was not long before Weener became Oregon Director of the Northwest Bonanza Society.

While he misses flight instructing, Weener is determined to take advantage of the bully pulpit that serving as a member of the NTSB offers. "An important role of the Board is that of safety advocacy,"

You don't have to fly for a living to be a professional.

NTSB Board Member Earl Weener and his wife, Linda



Weener says. Only weeks after being sworn in, Weener was speaking to GA audiences. He spoke at Bombardier’s Annual Safety Standdown in October 2010 and plans to speak at the Pilatus Owners and Pilots Association’s Annual Convention in June.

In his September 2010 presentation on “Pilot Professionalism: It Isn’t Just for the Big Guys” at the American Bonanza Society Annual Convention and Trade Show, Weener made the case for improving safety through a focus on professionalism. Weener’s point: You don’t have to fly for a living to be a professional. This echoes the message FAA Administrator Randy Babbitt conveys to pilots.

In his remarks, Weener highlighted the disparity between the accident rates for part 91 corporate/ executive airplane operations versus piston-powered single-engine airplanes.

the benefits of specific equipment. GPS, map displays with terrain warning, onboard weather displays, and more, have real safety benefits.” Many spouses may merely see these as gadgets and discretionary purchases.

“Yes, they are new technologies, but, more importantly, they buy real safety benefits,” Weener says.

Weener’s wife is a big supporter of his flying. “She likes the destinations,” he says, “and has been a big fan of our flying trips. As for me, it’s more about the journey.”

Comparison of Corporate and Piston Single-Engine-Land Accident Rates

	Corporate/Executive	Piston SEL	Ratio
All accidents	0.28	7.99	29
Fatal accidents	0.07	1.38	20

Accidents per 100,000 hours, 1999–2008

Source: NTSB

The difference—about 29 times more accidents—between corporate/executive operations compared with piston-powered single-engine-land operations “should not be that dramatic,” Weener says. “Pilot professionalism can reduce that disparity and bring single-engine pilots more in line with corporate pilots.”

Weener offered a highly personalized solution for pilots who do not have the benefits of more sophisticated equipment and functions, specific training and experience requirements, and the dispatch support from which corporate pilots benefit. “Pilots, have your spouse provide part of your dispatch,” Weener said. A pilot’s spouse knows the pilot better than anyone else. “If a spouse sees any hesitation or concern, he or she should ask questions.”

Next, he told the spouses, “Quiz your pilot about the weather, the route, the fuel onboard, and the aircraft’s performance capabilities.” Then he told them to expand the dispatch function beyond preparing for a specific flight. The spouse should encourage his/her pilot to fly often, as well as urge the pilot to designate some flying for proficiency.

Looking back on that presentation, Weener reflects, “I also wanted to convey to the spouses

Right now, Weener’s personal journeys involve flying in less familiar East Coast airspace and becoming familiar with the TFRs and the Washington D.C. Special Flight Rules Area. But, it is his professional journey—improving transportation safety and, specifically, GA safety—where this lifelong safety advocate can make a big difference. ✈️

Lynn McCloud is managing editor of FAA Safety Briefing.

National Transportation Safety Board (NTSB)

NTSB is an independent federal agency charged with determining the probable cause of transportation accidents and promoting transportation safety. The NTSB (www.nts.gov) investigates accidents, conducts safety studies, and evaluates the effectiveness of other government agencies’ programs for preventing transportation accidents.

Based on its investigations and studies, the NTSB develops safety recommendations, which are issued to federal, state, and local government agencies as well as to industry and other organizations. It also reviews the appeals of enforcement actions involving aviation certificates issued by the FAA as well as the appeals of civil penalty actions taken by the FAA.

The Board consists of five members appointed by the President and confirmed by the Senate for a five-year term.

Nuts, Bolts, and Electrons

Read Any Good *Logbooks* Lately? *Making Sense of Aircraft Maintenance Records*

As any pilot, aircraft owner, or maintenance professional knows, an aircraft requires a thorough and seemingly complex system of record-keeping to ensure it can be operated safely. In addition to having the shared responsibility of ensuring an aircraft complies with all relevant regulations to maintain its airworthiness, there is also a need to keep an accurate log of equipment changes—everything from a new transponder to a new seat belt system.

Logbooks are the preferred method to enter and track these changes. With so many variations, it can be a daunting task to know which logbook to use when you are making or verifying an entry. And, even when you use the correct one, deciphering information from a logbook can be frustrating. With a little guidance on where and what to look for, you will have a clearer path to ensuring your aircraft has what it needs to fly legally and safely.

Logbook Breakdown—A Pilot Perspective

Most pilots are familiar with at least one type of records repository: the pilot logbook. Since it preserves all a pilot's flight time and training accomplishments, pilots are especially keen to ensure the precision of the entries that they and their instructors make.

That same enthusiasm for logbook accuracy does not always extend equally to maintenance

Too many pilots take aircraft maintenance record entries for granted.

logbooks. That could be due to a renter's not-my-airplane mentality or, even for involved aircraft owners, simply a lack of logbook know-how. It could also be that some pilots are too intimidated to ask to review the records, thinking that logbook peeping somehow second-guesses the integrity of the mechanics performing the work. Whatever the reason, too many pilots take aircraft maintenance record entries for granted. This unfortunate mindset can result in pilots missing critical information about the aircraft, not to mention the requirement for a pilot-in-command to verify airworthiness before a

flight. Bottom line: If you are flying an aircraft, you should be familiar with its logbooks.

Sometimes You *Can* Judge a Book by its Cover

It sounds basic, but a key to understanding logbooks is to know what they look like. Regulations provide guidance for the required maintenance record entries, but technically you do not need a "logbook." Maintenance records can be entered in a binder, notebook, work card, or even on the back of a napkin (*not* recommended). Although most maintenance operators do not use such casual methods, it is still important to expand your interpretation of a logbook beyond the traditional black, leather-bound booklet with "logbook" neatly embossed on the cover.

That said, a commercially printed logbook is still the tool of choice to track maintenance records for GA aircraft. In some cases, aircraft owners use a single master logbook with index tabs for each component. In others, aircraft owners use different documents for each category of equipment. This practice helps organize recordkeeping and enables easier transfer of records if the engine or some other component is removed or replaced.

Typical GA maintenance logbooks may include the following categories:

- **Engine**—used to track engine inspections, tests, repairs, alterations, Airworthiness Directives (AD), Service Bulletins (SB), and equipment removal or exchange.
- **Airframe/Aircraft**—used to track airframe inspections, tests, repairs, alterations, ADs, SBs, and equipment removal or exchange. It may also be used as a master logbook to track records for the entire aircraft.
- **Propeller**—used to track hub and blade inspections, repairs, alterations, ADs, factory bulletins, etc.

Other component-specific logbooks include a rotor logbook to track helicopter rotor assembly,

blade, and torque-event inspections; a wing logbook to track entries for weight-shift control and powered parachute aircraft wings; and an avionics logbook for avionics-related maintenance.

Knowing Where to Look

The most common items pilots look for include documentation of the annual inspection and, if the aircraft is used for hire, the 100-hour inspection. Owners who maintain a single aircraft logbook must record annual and 100-hour inspections in that record. However, those who maintain separate records for the airframe, powerplant, propellers, and other components must document the 100-hour inspection, if required, in the record of each component (see 14 CFR 43.11(a)). Entries for the annual inspection are required only in the main aircraft or airframe record.

ELT, static system, altimeter, and transponder inspections are typically accomplished during an annual inspection and recorded in the main airframe/aircraft logbook. The static system, altimeter, and transponder inspections may be combined in one entry, but these should still provide a date and description of the work performed. The maintenance provider may choose not to list an ELT operation test separately in the maintenance records if it is covered under a normal annual or 100-hour inspection for that aircraft. However, the expiration date of the ELT battery is a required entry.

To be airworthy, an aircraft's records must also show that it complies with any applicable ADs. This compliance status must be noted in the maintenance record; the entry must include the AD number, the method used to comply with the AD, and the date of any required future action with recurring ADs. It is a good idea to note what the ADs are and to be clear on specifically what work was performed. All maintenance record entries should be written so those unfamiliar with the work can read and understand it. For more specifics on the format of maintenance record entries, see Title 14 Code of Federal Regulations (14 CFR) sections 91.417 and 43.11.

Beyond the Logbook

The search for airworthiness verification does not stop with the logbook. Any time an aircraft has a major alteration or repair, the maintenance technician must complete and file FAA Form 337 with the aircraft's maintenance records. Some owners file these with the aircraft logbooks; others keep them in a separate binder. Regardless of

the method, know that after a major alteration or repair, Form 337 becomes part of the aircraft's permanent record. The AMT must send a copy to the FAA Aircraft Registration branch in Oklahoma City, where it is kept on file. Anyone interested in obtaining these records for any aircraft can request an electronic copy on CD from the FAA for a \$10 fee (<http://aircraft.faa.gov/e.gov/ND/>).

Another vital but often overlooked document is the aircraft equipment list. This document, a list of installed equipment on an aircraft, is usually included in the Pilot's Operating Handbook (POH) or Airplane Flight Manual (AFM). An AMT will post an addendum to this list any time equipment is added or removed. Not only is this crucial to calculating accurate weight and balance, but, depending on how long records are kept, it may be the only way to maintain an aircraft's historical accuracy. That is because 14 CFR 91.417(b)(1) stipulates keeping maintenance records (found in 91.417(a)1) only for one year after the work is performed, or until the work is repeated or superseded by other work.

While electronic maintenance logs are not (yet!) common practice in many GA maintenance facilities, their usage is growing since they provide an easier and more organized method of recording entries. However, many electronic systems do not meet the signature requirements of 14 CFR parts 43.9 or 91.417. If you are an aircraft owner/operator, it is your responsibility to ensure any system used to track and record maintenance complies with the appropriate regulations.

Bottom line: If you are flying an aircraft, you should be familiar with its logbooks.



Photo by Tom Hoffmann

Are We on the Same Page?

I cannot stress enough the importance of good communication between pilot and mechanic. A well-known aviation joke makes this point: The pilot's maintenance discrepancy ("squawk") states, "something is loose in cockpit;" the mechanic replies, "something tightened in the cockpit."

To avoid miscommunication, a pilot who has difficulty understanding a maintenance record entry should talk to the AMT who performed the work instead of brushing off or taking the entry for granted. Asking questions will provide better understanding and could also reveal something missing or overlooked in the entry or the procedure.

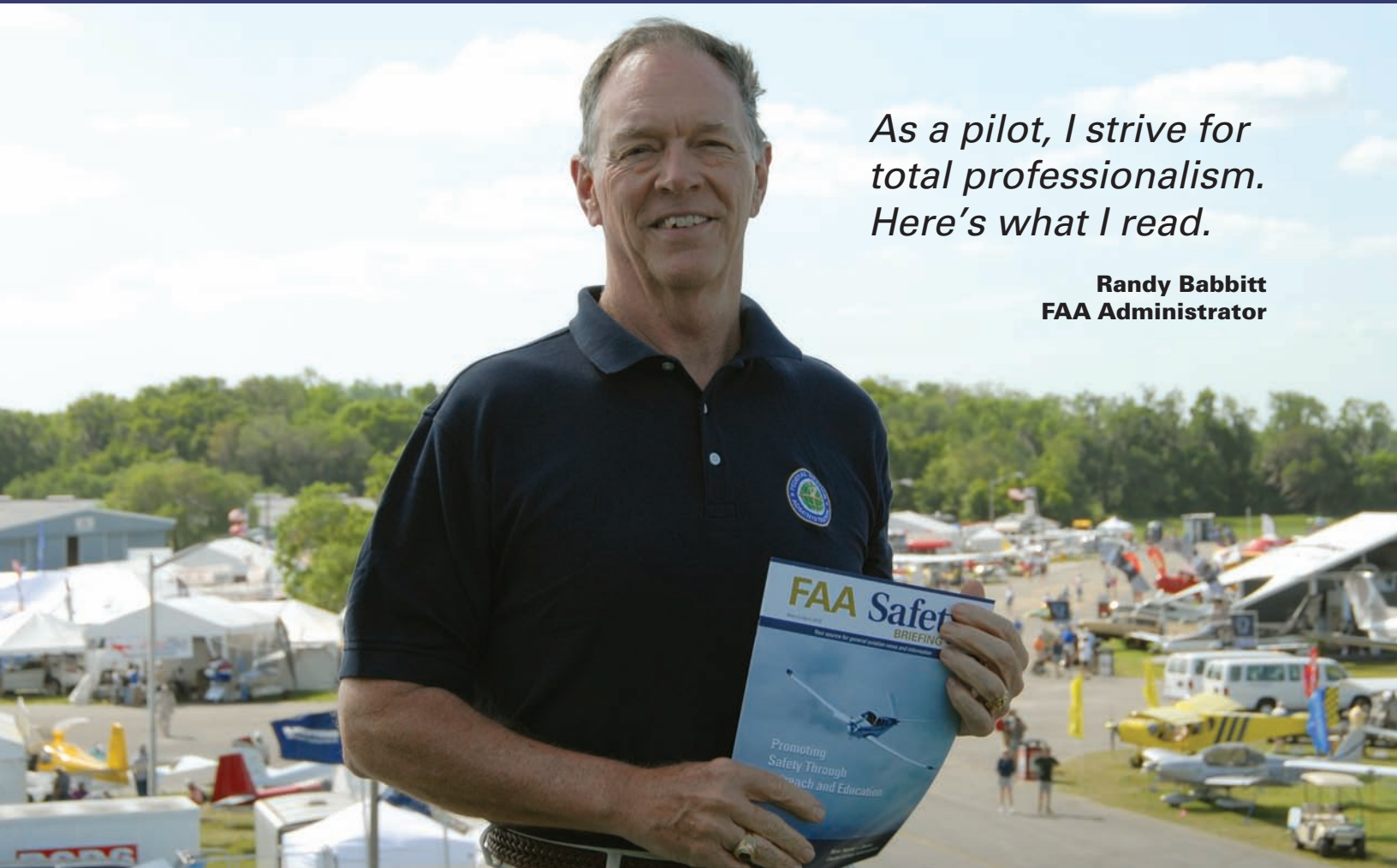
If you are a mechanic, it is imperative to be clear when you make logbook entries. Those entries may follow the aircraft through its entire

life, which, in all likelihood, may include more than one owner and several maintenance professionals. For example, when you perform an annual or 100-hour inspection, note whatever corrective and/or preventive action you performed instead of simply signing the inspection as complete. By providing a more complete picture of an aircraft's life story, you can help owners and other mechanics stay more in tune with the aircraft.

Following a detailed routine of verifying and documenting an aircraft's airworthiness may take some extra time and effort, but its potential lifesaving payoff is priceless.

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

Look Who's Reading FAA Safety Briefing...



*As a pilot, I strive for
total professionalism.
Here's what I read.*

Randy Babbitt
FAA Administrator

Angle of Attack



Steering Toward Greater Safety

Government/Industry Join Forces to Reduce GA Accidents

“The secret weapon is the data,” says Tony Fazio, director of FAA’s Office of Accident Investigation and Prevention. Fazio is referring to the agency’s renewed efforts to combat general aviation fatal accidents. “Using the GAJSC’s data-driven, consensus-based approach to analyzing accident information may hold the key to lowering the GA accident rate further.”

Short for General Aviation Joint Steering Committee, the GAJSC is a primary mechanism for government/industry cooperation, communication, and coordination on GA safety issues. The group’s achievements include several Web-based resource guides, including the *General Aviation Pilot’s Guide to Preflight Weather Planning*, *Weather Self-Briefings*, and *Weather Decision Making*, which provide advice to pilots on how to make safe weather flying decisions. And, while the committee has enjoyed a history of success, its most recent endeavors with data analysis are about to open new doors into understanding how and why accidents happen.

Formed in the mid-1990s, the GAJSC was modeled after the highly successful Commercial Aviation Safety Team (CAST), a multi-disciplinary group credited with helping to achieve a dramatic reduction in the fatal commercial accident rate over the last 15 years. Similar to CAST, the GAJSC’s methodology is to analyze accident and incident data to discover and mitigate the root causes of accidents. This is an ambitious task given the complexity and non-homogenous nature of GA operations—ranging from piloting something as small as a powered parachute to aircraft as large as a Boeing 747.

By bringing together key members in the aviation community, notably the AOPA Air Safety Institute and the Experimental Aircraft Association (EAA), among others, the group hopes to make progress on implementing more targeted safety solutions.

Key to the effort is the synergy between members of the GA community. “It’s a lot like being on an all-star sports team,” says Fazio, who chairs the committee with Bruce Landsberg of the AOPA Foundation. “Putting the right people together helps us leverage energy that sharpens our perspective on improving safety,” Fazio adds.

A collaborative undertaking, the GAJSC combines the expertise of many key decision-makers across different parts of FAA, various government agencies, and several GA associations. FAA players include the Air Traffic Organization, Flight Standards Service, and Office of Airports. The other federal agencies are NASA, NTSB, and the National Weather Service. Industry participants include AOPA, EAA, General Aviation Manufacturers Association, Helicopter Association International, National Business Aviation Association, and others.

In addition to a diverse membership, contributing to the GAJSC’s success is its specialized organizational structure. The safety analysis team (SAT) is at the heart of identifying issues and accident root causes. The SAT carefully reviews the data and determines where to focus resources. For example, if a manufacturing or design issue is identified as a safety

concern, subject matter experts validate the concern and provide feedback and possible solutions. The SAT confirms that the proposed solutions address the issue and works with the GAJSC members to determine the best way of implementing the largely voluntary mitigation strategies. One additional step unique to the new GAJSC structure is creating specialized measurement tools to gauge the effectiveness of the mitigation strategies.

Concurrent with the redesign of the GAJSC are several ongoing process improvements designed to address some of the more immediate issues, or “low-hanging fruit,” affecting GA. “We’ve had success with GA safety strategies in the past, but we know we can do better,” says Mel Cintron, manager of FAA’s General Aviation and Commercial Division. “Applying these data-driven techniques will help us focus on more effective non-regulatory intervention strategies that make the best use of our limited resources.”

Stay tuned for more information on new GA accident mitigation strategies.

Key to the effort is the synergy between members of the GA community.

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

Vertically Speaking

No Surprises: *The Best Approach to Flight Training*

“I love a good surprise, as long as I have time to plan for it.” That’s what a friend of mine says. At first glance it can sound contradictory since a surprise is unplanned. However, after reviewing three years of data regarding instructional/training flights from the Joint Helicopter Safety Analysis Team (JHSAT), I found wisdom in my friend’s statement. This is because during a training flight a student can surprise the instructor. Whether the surprise ends tragically or safely largely depends on whether the instructor planned in advance on how to respond.

My colleague Jim Grigg wrote about the JHSAT in the Sep./Oct. 2010 *FAA Safety Briefing*. The team analyzed 523 accidents for a three-year study period using the NTSB accident docket for U.S.-registered type-certificated helicopters. Of those accidents, nearly 18 percent, or 94 accidents, occurred during instructional/training flights, making it the second most common category after the 97 accidents in the personal/private category.

Through deeper analysis, we found that a significant number (40 out of 94) of the instructional/training accidents involved a practice autorotation. A practice autorotation is a brief maneuver typically completed in no more than 45 seconds if initiated from altitude or in 5 seconds

or fewer if initiated from a hover. If initiated from altitude, the pilot completes the maneuver to either power recovery or full touchdown. In a power recovery, the

pilot restores normal engine operating power prior to actual ground contact and can choose to either land the helicopter normally or go around. In a full touchdown autorotation, the pilot leaves engine power at idle until the helicopter comes to a complete stop on the ground.

Accidents that occurred during practice autorotations led to significant aircraft damage. Thankfully, only a few resulted in fatal or serious

injuries. While low fatalities and injuries are good news, it certainly would be better to reduce the number of accidents from practice autorotations rather than continuing to test various rotorcraft’s abilities to protect occupants from harm in the event of a crash. This goal led the JHSAT to identify the contributing factors to these accidents.

The JHSAT found that inadequate and untimely flight instructor action to correct the student was a problem in more than one-third of the instructional/training accidents. Let us look at this in the context of a practice autorotation. Since the maneuver progresses quickly, student errors, such as low airspeed, low main rotor rpm, and out of trim conditions, are magnified. The situation can deteriorate to an unsafe condition within seconds if the instructor does not intervene immediately. The student must learn the technical aspects and finesse of the maneuver, while the instructor must ensure the student’s mistakes do not become so severe they endanger the crew and aircraft.

In addition, the JHSAT found that inadequate instructor preparation and planning contributed to 14 percent of instructional/training accidents. To prepare for practice autorotations, instructors must consider factors including: the environment (density altitude, winds, landing surface), the aircraft (light or heavy aircraft based on fuel load), and the person (the student’s strengths and weaknesses evidenced in previous flights). However, thorough planning alone can be a waste of time without effective communication, which is best begun during the crew briefing prior to the flight. Part of the crew briefing must include a determination of the situations when transfer of aircraft control from the student to the instructor must take place. This is especially important during a practice autorotation when confusion about who is flying the helicopter can have disastrous results. Lack of effective transfer of control was a factor in about 11 percent of the instructional/training accidents.

For more resources, see the **FAA Rotorcraft Flying Handbook (FAA-H-8083-21)** at www.faa.gov/library/manuals/aircraft/media/faa-h-8083-21.pdf.

Based on these findings, the JHSAT developed recommendations for preventing practice autorotation training accidents. First, the instructor should follow the student more closely during the maneuver. This translates to being mentally and physically prepared to assume control of the helicopter when necessary. Second, instructors should be better trained to recognize cues for low rpm and airspeed issues. Part of this involves the instructor setting personal safety limitations and not letting the student go too far. Lastly, instructors must be aware of cues critical to safe flight by keeping their

own skills sharp. Maintaining proficiency through practice, preferably with other instructors, is key.

In short, the secret to preventing surprises and, importantly, enhancing helicopter safety revolves around instructors—improving preparation, practice, and communication.

Lee Roskop, a former U.S. Air Force officer and UH-1 helicopter pilot, is an Operations Research Analyst in the FAA Rotorcraft Directorate. Previously, he was an instructor and evaluator pilot at Air Force helicopter pilot training schools and also worked in Bell Helicopter's Flight Safety department.

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www.FAASafety.gov



Flight Forum



Avoiding Emergencies

Routines are crucial to avoiding emergencies ([Nov./Dec. 2010](#)). Visually inspecting fuel levels in all tanks reduces the likelihood of fuel exhaustion. Another routine involves how a pilot normally lands. If traffic allows, I cut power on downwind and complete the landing without adding power. This practice on nearly every flight means I will be well prepared to make a satisfactory landing if I lose power.

Paul Mulwitz
Camas, WA

When the Lights Go Out

Peter Rouse's article in the [Nov./Dec. 2010](#) issue causes me to offer some comments. First, the author's argument that ignition systems are electrical systems is not real accurate. Second, the author advises contrary to manufacturers' recommendations when he says to fix a dead battery with a jump start. Both Concorde and Gill proscribe jump starting a dead battery.

As the author described his in-flight learning experience I found myself wondering what kind of airplane he was flying. [From flying and maintaining Cessnas and Pipers] I seem to remember that a loadmeter should always have a voltmeter along with it.

Steve Robinson

Thank you for the excellent feedback. Your points illustrate the challenge of trying to condense discussion of a complex topic into the space of a single magazine article.

Though I agree that the ignition system is not the same kind of electrical system as the aircraft electrical power supply system, it is a type of electrical system. My point was that airplanes can have more than one type of electrical system.

My comments on starting when the battery is dead were intended to be generic, but I appreciate the opportunity to stress that pilots should always pay heed to the equipment manufacturer's recommendations in such cases.

I was flying a 1965 Mooney M20C that had only a loadmeter installed. I later installed equipment

that gave me better information on the health of the airplane's electrical system.

Thanks again for the opportunity to clarify some of the points in the article.—Peter Rouse

Practicing Proficiency

I've enjoyed reading several of your articles online recently, particularly "Practice Makes Proficient" ([Sep./Oct. 2010](#)). I offer two additional thoughts: There is a famous quote attributed to Vince Lombardi that goes something like, "Practice doesn't make perfect—perfect practice makes perfect." I also believe that striving for perfection, however unattainable, is its own reward and increased proficiency requires continually setting one's own performance bar a little higher.

Another mechanism I've used to become more proficient is to fly every chance I can (right seat or left) with better pilots than me, carefully observe what they do and how they do it, and ask questions. The best pilots never object to sharing their experience with others, and are often the first to agree that "hangar flying" can be an important safety enhancer if it's done in the proper spirit.

Christopher S. Domack
ATK Aerospace Systems Group
NASA Langley Research Center

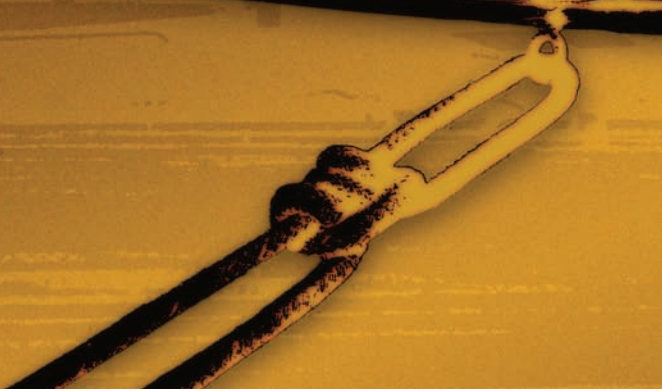
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comments, suggestions, and questions:
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SUSAN PARSON

Postflight



In Pursuit of Perfection

The process of writing and editing articles for *FAA Safety Briefing* often sends me scurrying to the shelves of my personal aviation library. The Safety Standdown themes we address in this issue provided plenty of reasons to resort to the more technical tomes. As we began to put the “tiedowns” on this issue, though, I found myself drawn to a different section of my collection. Specifically, I spent some time in re-reading and reflecting on the “School for Perfection” essay in my all-time favorite aviation book, Richard Bach’s *A Gift of Wings*.

With apologies to Bach for oversimplification, “School for Perfection” is the slightly mystical story of how the narrator, a prototypical flight instructor

“If your system involves accidents, the solution is not to find excuses. The solution is to change the system.”

mourning the tragic loss of a student, is rejuvenated and inspired by meeting Drake, proprietor of a hidden and highly unusual flight school. During a week in Drake’s company, the narrator learns a few lessons that we should consider in our collective quest for improving general aviation safety.

The curriculum in Drake’s School for Perfection starts with a lengthy study of “the wind, the sky, and the dynamics of unpowered flight.” The narrator scoffs: “At that rate, it’s going to take him a lifetime to learn to fly.”

“Of course it will,” is Drake’s matter-of-fact response. He patiently explains that a true pilot must develop an understanding of, and respect for, the basics of flight itself before he becomes an aerial systems operator.

Bach made this prescient point decades before the advent of airliner-style avionics and automation. The continuing occurrence of accidents attributable to deficient stick-and-rudder skills makes it just as valid today.

The narrator is shocked to find one of Drake’s primary students at the controls of a Curtiss JN-4 *Jenny*: “That’s an old engine! It can quit in flight, you know.”

“Well, of course it can quit!” says Drake. For that reason, students in the School for Perfection

get extensive instruction in all aircraft systems. They learn, for example, not only how a given engine works, but also where its weaknesses lie and what failures to expect. Hmmm. How many of today’s pilots—myself included—are dedicated to mastering our machines to that level of detail? Lulled by the incredible reliability of modern machinery, too many of us are tempted to assume that mechanical malfunctions happen to other people.

What the fictional Drake does *not* accept is the narrator’s contention that accidents are inevitable. Says he, “If your system involves accidents, the solution is not to find excuses for the accidents. The solution is to change the system.”

As Drake explains to the narrator, the School for Perfection is built on a core premise: “We decided to take the time to give a pilot skill and understanding, instead of listing rules.” He contends that his approach creates pilots who “know more about flying than how to steer an airplane,” because his students invest so much time in first understanding the fundamentals of flight.

Accustomed to a less-disciplined environment, the narrator is deeply impressed by the atmosphere of pride, professionalism, discipline, and “incredible respect” that characterizes every aspect of Drake’s School for Perfection. As he observes, Drake “had not missed a single avenue that would bring perfection in flight.”

Let us all seek to do the same.

Susan Parson (susan.parson@faa.gov) is editor of FAA Safety Briefing and a Special Assistant in the FAA’s Flight Standards Service. She is an active general aviation pilot and flight instructor.

FAA Faces



Bryan Neville

Hot air ballooning is another of Neville's aviation endeavors.

Weaving a Web of Safety

"I wish more people knew we offer more than just seminars." This is the lament of a pilot/educator whose varied background and strong passion have earned him recognition in the world of aviation safety. Much like the www.FAASafety.gov Web site he manages, Bryan Neville's aviation safety career is woven from a number of strong threads.

It was a weekend solo in 1968 that put a U.S.A.F. sergeant on the path to his life's work and passion for aviation safety. Shortly after he left the Air Force, Neville had progressed to a commercial certificate. After settling in Utah, he quickly added instrument and multi-engine ratings before earning a flight instructor certificate. Neville then found work instructing and managing a flight school that expanded to five locations, 30 aircraft, and 50 instructors during his tenure. In his "spare time," Neville flew corporate aircraft and later became a part 135 charter pilot and flew missions for the U.S. Forest Service. He also became a designated pilot examiner.

Neville's FAA career started when he disagreed with an FAA inspector's findings during an inspection of the flight school where he worked. Confident in his understanding of the rules, Neville requested a meeting with the inspector's supervisor.

"I was able to point to the specific paragraphs that showed why we were operating the way we were," Neville recalls. The supervisor agreed and later asked Neville if he had ever considered working for the FAA. Neville applied and never looked back.

Of Neville's many responsibilities as an operations inspector at the beginning of his FAA tenure, he was intrigued by accident investigation.

"I felt that the written reports were not providing enough information about why the accidents really happened," Neville explains. "I wanted to know what triggered the sequence of events that led to the accident."

This interest, along with an accounting degree and an MBA, led to Neville's joining the FAA Safety Team (FAASTeam) as program manager for the

Salt Lake City Flight Standards District Office. His education exposed him to the tools of detailed analysis he would later find so useful.

"I used my academic training to research a possible correlation between accidents and check-ride failures," Neville says. "I looked at data for a specific area and time and found a high correlation: Pilots have accidents for the same reasons that they fail check rides." Neville hopes to see this project expanded to develop data to support meaningful changes to the Practical Test Standards.

In his role as FAASafety National Outreach Manager, Neville's goal is to help pilots and mechanics maximize FAASafety resources, which include traditional seminars and more modern tools, such as the [FAASafety.gov](http://www.FAASafety.gov) Web site. As webmaster, Neville wants airmen to understand that "we truly are looking for every possible way to decrease the general aviation accident rate."

With flight instruction his first love in aviation, Neville is eager to get his fellow flight instructors more involved with the FAASafety Team and make them better aware of resources available through [FAASafety.gov](http://www.FAASafety.gov).

"Instruction is the key to lowering the accident rate and increasing safety," Neville asserts. "Instructors can help convey the responsibility and awareness entailed in being pilot in command. It is not just the physical task of flying, but also the ability and discipline to focus on planning and all other aspects of the flight."

Based on his years of research, investigation, and experience, Neville's advice to GA pilots: "Plan carefully, think ahead, and always have alternatives in mind."

It is sound advice, which, like Neville's work, can make a real difference in aviation safety.

"Plan carefully, think ahead, and always have alternatives in mind."

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



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A red and white Cessna airplane is shown in flight, banking to the right over a runway. The background is a blurred green field and a grey hangar.

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