FAA Safety BRIEFING

Your source for general aviation news and information

Compliance Philosophy:

The FAA's **Evolving Approach** *to* **Aviation Safety**

**Federal Aviation
Administration**

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The January/February 2016 issue of *FAA Safety Briefing* focuses on the FAA's new Compliance Philosophy and what its foundational concepts mean to the general aviation community. Articles in this issue discuss how the agency and aviation community can identify a problem in the NAS, use the most effective tools to correct that problem, and monitor to be sure it stays fixed into the future.

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Getting a Fix on Safety

You might have heard that FAA Administrator Michael Huerta recently gave a speech introducing the FAA's "Compliance Philosophy Order." You can read key parts of the speech elsewhere in this issue of *FAA Safety Briefing*, so let me share here the summary I'm giving to Flight Standards Service employees.

Compliance is expected and required of everyone who operates in the National Airspace System, or NAS. Compliance means following the rules, but it also means going beyond the rules by taking proactive measures to find problems and fix them to manage or mitigate the risk they create in the system.

Foundational Concepts

The Compliance Philosophy Order is based on two core premises.

The first assumption is that most people want to operate in compliance with the rules. We know that pilots don't walk out to the airplane trying to think of ways to break the rules; they intend to comply and they make efforts to do just that. We are all human, though, and mistakes happen to the best of us. In most cases, failure to comply with the rules happens as the result of things like lack of training, lack of knowledge, diminished skills, or procedures that are not working as they should.

It's not okay to do nothing when these errors occur, because they can have serious safety consequence in our highly complex airspace. But the correct response to inadvertent errors is not blame, which looks backward and focuses on punishment for what's already happened. Rather, we seek accountability, which takes responsibility and looks forward. Accountability is about finding the problem, using the most effective tools to fix it, and monitoring to be sure it stays fixed into the future.

The second assumption is that the greatest safety risk in the NAS does not arise from a specific event or its outcome. Instead, we have to evaluate risk based on the operator's willingness and ability to comply with safety standards. The greatest risk comes from an operator who is unwilling or unable to comply with rules and best practices for safety.

Let me talk a little about what those terms mean. A pilot who is *unwilling* is someone who knowingly violates regulations, or one who takes inappropriate risks. We also use the term "unwilling" to describe a pilot who does not cooperate or collaborate in the effort to find the problem and fix it in a sustainable way. A pilot who is *unable* is one who fundamentally lacks the skills or qualifications needed to comply with the rules. That's different from someone who has the skills or qualifications, but makes an error for some of the reasons I listed earlier.

WIIFM

So what does that mean for you? Given these foundational concepts, Compliance Philosophy means that in the case of pilots who are willing and able to comply, and who are cooperative in taking the steps necessary to get back to compliance, the best way to meet our safety goal is to use tools like training, education, or better procedures.

The enforcement tool is for cases involving someone who is unwilling or unable to comply as described above. Enforcement is a means to rehabilitate and bring those individuals or operators back into compliance — back into the category of those who are both willing and able to meet standards. If a pilot continues to be unwilling or unable, though, we use stronger enforcement to move that person out of the NAS. I think you'd agree that you don't want to be sharing the skies with someone who is either not willing or not capable of operating according to the rules and procedures intended to keep everyone safe.

You may wonder how Compliance Philosophy is different. In many ways, it's not; It simply clarifies and reinforces the discretion that the FAA already has to use the most appropriate action to resolve safety issues in the NAS. But that clarification is important, because it firmly puts the focus where it should be: to achieve rapid compliance, to eliminate the safety risk, and to ensure positive and permanent changes.

The Compliance Philosophy approach does require new mindsets and new behaviors in both the FAA and the community. These include the expectation and appreciation for self-disclosure of errors, and recognition that compliance means operating according to both the letter and the spirit of the law. It will take effort from all of us, and it won't be perfect. But the kind of change we are promoting is essential to achieving our safety mission, and the results will more than justify the effort.
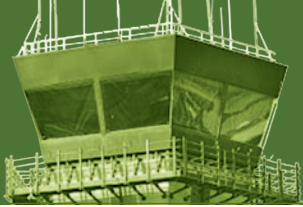
Angle of Attack Awareness Video Released

Angle of Attack (AoA) indicators may help prevent loss of control in small aircraft because they provide a more reliable indication of airflow over the wing. Although they have been available for some time, the effort and cost associated with gaining installation approval has limited their use in general aviation. The FAA streamlined installation requirements to garner greater use of the devices and increase safety in general aviation.

"We have eliminated major barriers so pilots can add another valuable cockpit aid for safety," said FAA Administrator Michael Huerta. "These indicators provide precise information to the pilot, and could help many avoid needless accidents."

In October, the Partnership to Enhance General Aviation Safety, Accessibility and Sustainability (PEGASAS) — which enhances general aviation safety, accessibility, and sustainability by partnering the FAA with a national network of world-class researchers, educators and industry leaders, — created an awareness video to present an analysis of AoA devices in the GA environment. The video also promotes FAA policy concerning non-required/supplemental AoA based systems for GA airplanes. The video is available on FAA's YouTube channel at https://youtu.be/8JcjWnAJGKQ.

Screenshot from AoA Video

UAS Registration Task Force Created

Earl Lawrence, director of FAA's UAS Integration Office, and Dave Vos of Google X, are the co-chairs of the new Unmanned Aircraft Systems (UAS) Registration Task Force. Department of Transportation (DOT) Secretary Anthony Foxx and FAA Administrator Michael Huerta announced the formation of the task force in October, which represent a range of stakeholder viewpoints, interests, and knowledge. Membership was by invitation only, and a public comment period was also opened.

Along with FAA and DOT, the Department of Commerce, Department of Defense, Department of Homeland Security, Department of the Interior, Office of Management and Budget, NASA and Department of State provided expert support to the task force.

The task force will advise DOT on aircraft that should be exempt from registration due to a low safety risk, for instance toys and other small UAS. It will explore options for a streamlined system that will make registration less burdensome for commercial UAS operators. Those and other safety recommendations were presented in a final report to the agency on Nov. 21. As of press time, the report is under review.

"Registering unmanned aircraft will help build a culture of accountability and responsibility, especially with new users who have no experience operating in the U.S. aviation system," Foxx said. "It will help protect public safety in the air and on the ground."

Every day, the FAA receives reports of potentially unsafe UAS operations. Pilot sightings of UAS doubled between 2014 and 2015. The reports ranged from incidents at major sporting events and flights near manned aircraft, to interference with wildfire operations.

"These reports signal a troubling trend," Huerta said. "Registration will help make sure that operators know the rules and remain accountable to the public for flying their unmanned aircraft responsibly. When they don't fly safely, they'll know there will be consequences."

Check www.faa.gov/uas for updated information.

ICAO Flight Plan to Become Norm

Currently, pilots file flight plans in the U.S. under either domestic or International Civil Aviation Organization (ICAO) formats. Both contain specific information relating to the proposed flight of an aircraft, and controllers use them to provide air traffic services. Form 7233-4 (ICAO International Flight Plan) is now recommended to be used when flying IFR domestically.

The FAA is transitioning to require ICAO flight plan filing for IFR/VFR civil domestic flights. The transition was set to occur on October 1, 2015. However, in response to user feedback, the FAA has
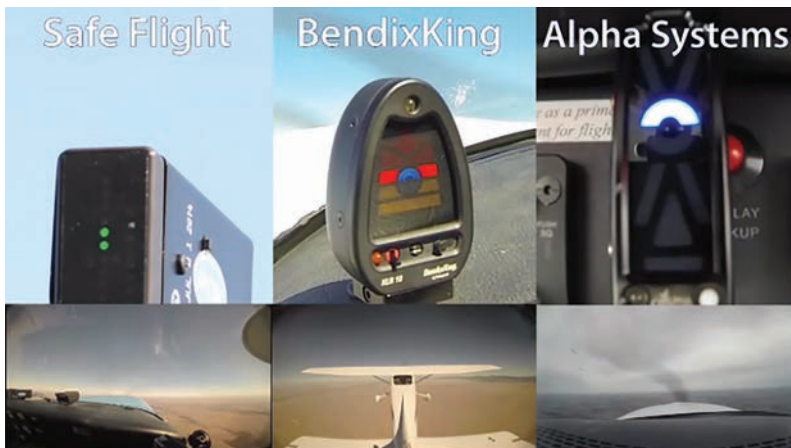
postponed its transition to on or after October 1, 2016.

The use of this single format will simplify the flight planning process and align U.S. flight plans within ICAO standards. It will also enhance ATC services by allowing for the identification of equipage. This additional time for education and guidance to the flying public and updating all required publications will provide a positive transition process.

Switching from the domestic plan format to ICAO format is relatively simple — most of the fields in the domestic form are found in the international form. While some wording is slightly different, pilots experienced with filing domestic plans will see close similarities with most of the international fields. Procedures are currently being developed to file SFRA/FRZ/ADIZ and composite flight plans that will support automation when using FAA Form 7233-4.

Don't wait until the transition is complete. You can get ahead of the game by filing your flight plan in ICAO format today. You can find simplified guidance on how to file an ICAO flight plan at www.faa.gov/go/flightservice.

FAA Provides Clarification on Logging Instrument Approaches

This past fall the FAA posted an Information For Operators (InFO) notice that clarifies the conditions under which a pilot may log an instrument approach procedure (IAP) in his or her logbook. The InFO was posted in response to several requests for clarification and legal interpretations regarding what constitutes a "loggable" instrument approach.

For example, as stated in the InFO, a pilot cannot log an IAP for currency in an aircraft without also logging actual or simulated instrument time. Simulated instrument conditions occur when a pilot uses a view-limiting device in an aircraft to prevent the pilot from seeing outside visual references. Consequently, a pilot operating under simulated instrument conditions is required to have a qualified safety pilot present and must also log the name of that safety pilot.

The InFO also provides examples that may help pilots determine when an IAP qualifies as an approach that may be logged. For more information, go to http://go.usa.gov/cYUNY.

Remote Tower Successfully Tested

Defense and security company Saab, the Virginia SATSLab, Inc. (VSATS) and the Leesburg Executive Airport in Virginia partnered to demonstrate and evaluate Saab remote tower technologies at Leesburg. The FAA, Virginia Department of Aviation, and National Air Traffic Controllers Association (NATCA) served in advisory roles in the program. Both the FAA and NATCA provided controllers to support the data collection activities during the summer of 2015, which demonstrated and evaluated the remote tower system for use at non-towered airports.

For the demonstration, the partnership deployed high definition video cameras, pan-tilt-

Safety Enhancement Topics

January: Best Glide Speed and Distance — Understanding the safety benefits of flying at best glide speed while maneuvering to a forced landing runway or off airport landing area.

February: Perform Advanced Preflight After Maintenance — What items should you focus on and/or add to your preflight inspection checklist after maintenance?

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

zoom cameras, signal light guns, and microphones to provide data directly to a Remote Tower Center also located at the airport.

With the phase-one milestone achieved, the data will be analyzed and form the basis of a report. This report will be presented to the FAA for approval in order to move on to the next phase, which will go through mid-2016 with the goal of operating remote air traffic control towers at airports that are now non-towered. For more information, visit Saab's remote tower page at http://saab.com/security/air-traffic-management/air-traffic-management/remote-tower.

FAA Focuses on Helicopter Safety

The total number of U.S. helicopter accidents has steadily declined over the past 10 years, but the aviation community has not made sustainable progress in reducing the number of fatal accidents. In response to the FAA's 2013-2014 post-crash fire and blunt force trauma study, along with concerns raised by the NTSB, the FAA has tasked the Aviation Rulemaking Advisory Committee's (ARAC) Rotorcraft Occupant Protection Working Group to take a new look at the airworthiness standards for older helicopter type designs. This work will focus on solutions that give helicopter occupants the greatest possible chance of surviving an emergency landing or accident.

The FAA issued rules in the 1980s and 1990s to protect helicopter crews and passengers from blunt force trauma and post-crash fires. Those rules raised occupant protection standards for new type-design helicopters. However, the rules did not apply to newly-manufactured helicopters with older type designs still in production, including new "derivative" models that are sufficiently similar to older type designs. As a result, most helicopters produced today are not required to include life-saving features such as crash-resistant fuel systems and energy-absorbing seats mandated by later rules, and voluntary equipage has been slow. In fact, as of the end of 2014, only 16 percent of the U.S. helicopter fleet included crash-resistant fuel systems and only 10 percent had energy absorbing seats.

The Rotorcraft Occupant Protection Working Group will provide the FAA with three reports over the next six-to-24 months. Information about the group's tasking and deliverables are outlined in the Federal Register at http://go.usa.gov/cYQJR.

New Year, New Goal

As we open a new year I have some very good news to share. Recently we completed our analysis of 2014 airmen medical exams and found that we not only achieved our goal of seeing 95 percent of airmen walk out of the Aviation Medical Examiner's (AME) office with a medical certificate, but we went beyond to 96 percent! I can't tell you how proud I am of that fact. That achievement was only possible with the cooperation of the FAA's Office of Aerospace Medicine, AMEs around the country, and airmen like you. That means that 20,000 more exams ended with a medical certificate being issued, rather than a deferral.

That improvement means 20,000 fewer deferral cases for our Aerospace Medical Certification Division (AMCD) to deal with. That, in turn, means shorter wait times for those cases we do have to defer. In a world where government resources are finite, this accomplishment allows us to improve your medical certification experience. Our average wait time for deferred airmen is now 21 days. That's down from a high of 76 days in 2014.

When you achieve a goal, the next step is to define the next one. After looking at our data, we have set a new goal of 98 percent. I believe we can achieve this goal but it is going to take continued cooperation from you as airmen.

CACI

I know we've talked quite a bit about Conditions AMEs Can Issue (CACI) in these pages before. This program has been a fantastic success for us at the FAA and for you as airmen. CACI was developed by using an SMS process to examine which medical conditions, with certain additional information, could be safely issued by our AMEs rather than requiring deferral to the AMCD or Regional Flight Surgeon (RFS). By following the CACI process and having any required additional information ready to go before you visit the AME, you can walk out of the office with an unrestricted medical certificate. You can find a list of the CACI conditions and worksheets detailing the extra information at: http://1.usa.gov/1WuMSxn.

Last year we added two new CACI conditions to the program: bladder cancer and kidney stones. This brings us to 14 CACI conditions and we are very excited about expanding the program even further.

We have a large list of potential conditions and are actively working on half a dozen right now.

What Do We Need From You?

Overall, keep doing what you're doing. Together we've improved the rate of airmen walking out with a medical in hand. What we have also learned is that not everyone who's eligible for a CACI gets one. A couple years ago, a study showed that nearly 40 percent of those who should have been issued under CACI were deferred. As I've mentioned before, our oversight system is very good at determining when AMEs issue certificates that they shouldn't, but it is not good at seeing when AMEs don't issue a certificate that they should. So we still need you to be an educated consumer when you walk into your AME's office. If you feel you should have qualified for a CACI and didn't get one, we need to hear about it. Failing to properly issue certificates under CACI not only hurts you, but also wastes valuable time that could be better spent dealing with conditions that require further review.

Another area for improvement: cases when we request more information from you. We need you to provide that information completely and promptly to reduce your wait time. If you or your AME have a question about what tests or information we need, please contact the RFS. If the RFS is unable to answer your question, please contact the AMCD. This process will help reduce the back and forth that can be so frustrating. If we can get it right the first time, things will go much more smoothly. You can find contact information for the RFS here: http://1.usa.gov/1HnuSxM.

Again, thank you for your help in making the medical certification process better.

> We not only achieved our goal of seeing 95 percent of airmen walk out of the Aviation Medical Examiner's (AME) office with a medical certificate, but we went beyond to 96 percent!

James Fraser received a B.A., M.D., and M.P.H. from the University of Oklahoma. He completed a thirty year Navy career and retired as a Captain (O6) in January 2004. He is certified in the specialties of Preventive Medicine (Aerospace Medicine) and Family Practice. He is a Fellow of the Aerospace Medical Association and the American Academy of Family Practice.

Need ADS-B?
Get Answers...

www.faa.gov/go/equipADSB

Q1. **My cardiologist says they do not make "line drawing" anymore when implanting stents. I have forwarded all of the other info that was requested. Does the FAA really need line drawing for Class 3 medical? Very confusing.**

A1. The FAA does not require submission of a "line drawing" to be considered for any class of medical certificate following coronary artery stenting. We do require copies of the actual pictures from cardiac catheterization/stenting to be submitted in digital format on CD-ROM. While some heart centers may still include a line drawing as part of their clinical documentation of stent placement, digital storage of cardiac angiography and catheterization images has made line drawing obsolete. It would be helpful if you could write to the Federal Air Surgeon's office to let us know where and how you were told to provide a "line drawing" so we can take any corrective action needed.

Q2. **I earned a private pilot's license in 1988, but quit flying in 1989. I had a mitral valve repair done in 2006. The operation was a complete success, as certified by the surgeon and two cardiac specialists. I began flying again in 2012. My medical is a special issuance, requiring me to submit a cardiac exam, EKG, and sonogram every year. This costs me over $2,000 out of pocket every year, as medical insurance will not cover a non-condition. My doctor, the cardiac specialist, and AME have all submitted letters to the Aerospace Medicine Certification Division stating the testing is not necessary. I have submitted my medical data and test results to the Aerospace Medicine Certification Division twice without a satisfactory response. Why am I being penalized for a condition that has been addressed?**

A2. The severity and progression of heart valve disease varies depending on the individual and the valve involved. Likewise, when a heart valve has been surgically repaired, the durability of that repair depends on the individual and the underlying valve disease. Many heart valve repairs are "temporary" measures that can slow but not stop disease. However, if your treating cardiologist believes that your follow-up may be modified or eliminated based on specifics of your case and the medical literature about your particular type of repair, please request reconsideration of your case by the Federal Air Surgeon, by either writing to the Aerospace Medical Certification Division (AMCD) or directly to the Federal Air Surgeon's office.

Q3. **One of the questions on the FAA's medical form (Form 8500-8) asks us to list any hospital stays. I had surgery as a child, over 40 years ago. Over the course of my flying, I've probably had 16 or more FAA physicals. I know that in the course of some of those physicals the physician advised "that's old enough that it doesn't matter … leave it blank." Others have advised "if you've already reported it once, you don't need to report it again." (I may have reported it … who can remember?)**

At this point, I'm not sure whether I should mention it to the FAA or not. I truly don't see how it's relevant, but I don't want to get into a tiff with the FAA for not reporting it. On the other hand, if I suddenly report it now, I'm essentially admitting to improperly reporting it in the past. What's a well-meaning old pilot to do?

A3. The questions that are listed in section 18 of MedXPress specifically ask, "have you ever in your life." So the correct answer is: you should have reported it on your first medical application and every application thereafter. The nature of the surgery should be documented the first time it is reported, and after that it can be designated PRNC (previously reported, no change). Without knowing the nature of the surgery, it is impossible to say whether or not the information is still relevant. You should report it on your next exam.

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BY FAA ADMINISTRATOR MICHAEL HUERTA

Another First *in Our* Safety Evolution

Editor's Note: The text below is an abbreviated version of FAA Administrator's "Another First in Our Safety Evolution" speech to the Flight Safety Foundation Media Breakfast on October 6, 2015. For the full text, please see: http://1.usa.gov/1PjtCCr

Photo by Chris Morris

Improving safety is an endless series of "firsts," because improving safety is an endless evolution. Today, because the FAA and our aviation partners have embraced this evolutionary approach, airline passengers in the U.S. take safety for granted. Our aviation system has achieved a level of safety that really has no historical precedent in any mode of transportation — and there is an assumption that we will continue to set the gold standard when it comes to safety.

A key element in our approach is to constantly strive to be better. That means we have to question whether we can do things differently, to work smarter, or to work more efficiently.

We know that we need to constantly and continually evolve to meet the safety challenges of tomorrow. And we recognize that the aviation environment has reached a level of complexity where we can't achieve further safety improvements by following a purely rule-based approach.

So the FAA and industry began implementing Safety Management Systems, which are designed to identify hazards, assess the risks from those hazards, and put measures in place to mitigate those risks. This is the core of what we call our Risk-Based Decision Making Initiative.

Now we're taking our Risk-Based Decision Making initiative to the next level through what we are calling the Compliance Philosophy.

Compliance Philosophy

The Compliance Philosophy is the latest step in the evolution of how we work with those we regulate. It focuses on the most fundamental goal: find problems in the National Airspace System before they result in an incident or accident, use the most appropriate tools to fix those problems, and monitor the situation to ensure that they stay fixed.

The Compliance Philosophy recognizes that what we all want is for everyone to comply with aviation's high safety standards. It recognizes that most operators voluntarily comply with both the rules and the core principles of a Safety Management System. It also recognizes that in today's complex aviation environment, even the best operators make

honest mistakes. But even unintentional errors can have a serious adverse impact on aviation safety, so we have to fix the problem.

So, in cases where a deviation results from factors such as flawed procedures, simple mistakes, lack of understanding, or diminished skills, we use tools like training or documented improvements to procedures to ensure compliance.

That doesn't mean we're going to go easy on compliance, or that we're ignoring minor issues, or making anyone feel like they have a free pass. We still have zero tolerance for intentional reckless behavior or inappropriate risk taking. Enforcement is, and always will be, one of the tools that we will use to ensure compliance. We use the enforcement tool in the case of willful or flagrant violations, or for refusal to cooperate in corrective action.

The success of our Risk-Based Decision Making initiative, which includes Safety Management Systems and now the Compliance Philosophy, requires both the FAA and the aviation community to evolve in how we do business and how we interact with one another.

To find and fix safety problems, there has to be an open and transparent exchange of information and data between the FAA and industry. We don't want operators who might inadvertently make a mistake to hide it because they have a fear of being punished. If there is a failing, whether human or mechanical, we need to know about it, to learn from it, and make the changes necessary to prevent it from happening again. Again, it's about finding the problem, fixing the problem, and making sure it stays fixed.

A New Mindset

That open and transparent exchange of information requires mutual cooperation and trust, which can be challenging to achieve in the traditional, enforcement-focused regulatory model.

So what specifically are we doing on the FAA side?

- We have started training for all FAA employees on the new Compliance Philosophy, with detailed "how-do-I-implement-it" training for each Line of Business.

- We are using data, not calendar dates, to determine when and where to conduct surveillance and inspections.

- We are emphasizing that we expect our employees to use critical thinking, which is essential to successful implementation of the Compliance Philosophy. We want inspectors

to use their judgment, experience, expertise and qualifications to identify risk, to work with the individual or operator, and to identify the most appropriate tools needed to permanently fix the problems.

On the industry side, success requires understanding that compliance means going above and beyond. The FAA expects certificate holders to develop and implement risk controls that are appropriate to their operational environment. That means thinking about outcomes and performance, identifying hazards, and mitigating associated risks, and implementing practices and procedures that encourage reporting.

To get useful reporting, both regulators and operators have to understand the difference between accountability — which accepts responsibility and looks forward — and blame, which focuses on punishment for what's already happened. With accountability, the idea is to look at the operator's compliance attitude.

And that's where the Compliance Philosophy is a critical part of the risk-based decision-making approach. The Compliance Philosophy recognizes that the greatest systemic safety risk arises not from a specific operational event or its outcome, but rather from the operator's willingness and ability to comply with safety standards and to operate in accordance with the core principles of a Safety Management System.

So, we use tools like training or documented improvements to procedures to ensure compliance in cases where a deviation results from factors such as flawed procedures, simple mistakes, lack of understanding, or diminished skills. And we use the enforcement tool in the case of willful or flagrant violations, or for refusal to cooperate in corrective action.

In our continuing work to maintain the U.S. system as the gold standard for aviation safety, we start with the fundamental idea that compliance is the foremost factor in safety. In all cases, the goal is to achieve rapid return to compliance, to mitigate the risk, and to ensure positive and permanent changes that benefit the aviation industry. That's what Compliance Philosophy is all about. ✈

Learn More

FAA Compliance Philosophy Order
http://1.usa.gov/1NYfePK

How do You do Safety?

Developing Sound Risk-Based Decision Making Practices in Aviation

SABRINA WOODS

"The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking."

— Albert Einstein

Change is coming.

While the FAA's mission will always be to provide the safest and most efficient aerospace system in the world, our way of going about that has changed a bit. Having the greatest aviation system has been a result of learning from the school of hard knocks. In the past, when an aviation accident would occur, the aviation community — consisting of the airlines, the manufacturers and the government, — would work tirelessly to determine the cause and put measures in place to help ensure it would never happen again. We have gotten pretty darned close too, at least in the air carrier world. But now we have invested in a new way of doing business, and in order for it to be successful, everyone has to be on board. From AOPA, Aeronca, and American Airlines, to GAMA, Garmin, and Grand Rapids Technologies — we all have a duty to help safeguard the national airspace system. This includes you, too, dear aviator.

Photo by H. Dean Chamberlain

Compliance Philosophy

As you will read elsewhere in this edition, FAA Administrator Michael Huerta has laid the foundation for a new compliance-based way of doing business. While the old methods have served us well, it is now time to move to more forward-thinking initiatives. We want to be proactive, rather than reactive when it comes to aviation safety. This all starts with something we call "Risk-Based Decision Making," or RBDM. Compliance philosophy focuses on following the rules, but our ultimate goal is to find problems and fix them *before* the metal gets dented. We achieve this by applying RBDM. It is a key component of risk management and is the hallmark of a good safety management system (SMS).

While it is always prudent to learn from the past, we can only measure success when we push the conversation forward and challenge what we think we know. When applying RBDM, we must take into consideration every factor available in order to identify and control the potential for hazard. Information can come from all sorts of valuable sources: industry crosstalk, pilot information sharing venues such as the aviation safety reporting system (ASRS), manufacturing defects reports, and from an introspective (and critical) look at our own processes. With each new piece of information, we determine how it fits into the big picture, and how it might affect something else in the system. This way we can hash out solutions — hopefully far in advance of an incident ever occurring.

Even better is that we constantly share this information back and forth with our aviation industry and government counterparts, and even with other countries, and it is our hope that they do the same. The more we all talk, the stronger we become. Just think about how far commercial air travel has come in just the last decade. By applying some basic principles of safety risk management, we've decreased fatal accidents in commercial aviation by over 80 percent. Now we are going to do the same for GA.

How do YOU do Safety?

As I mentioned before, in order for compliance philosophy to work, we all need to be a part of it. So now it is your turn; How do *you* do safety? A personal safety risk management process that includes RBDM isn't much different than what a large organization would follow.

Still unsure about it? You might not realize it, but you are likely engaging in risk management every single day. It happens when you change lanes while driving, and you take the time to look and see how close the other cars are around you. It occurs when you judiciously lather on sunscreen and select a wide brim hat and UV protected lenses prior to a day out at the beach to avoid getting burned. It also happens when you opt for the 7 p.m. movie instead of the 10 p.m. because you know you have to be up at 5 a.m. for an early meeting and you want to be alert. For almost every decision, there is a chance for an unwanted outcome, so all RBDM does is consider what those outcomes might be ahead of time so you can do things to prevent the bad ones from happening.

For the GA pilot this might mean gathering weather briefings, engaging in "hangar flying" conversations with fellow aviators, listening to traffic information, and taking time to really scrutinize the route. It could mean investing in the latest technologies to assist in increasing situational awareness, taking a refresher lesson with a CFI to brush up on instrument approaches, and reviewing the *Pilot's Handbook of Aeronautical Knowledge* for safety tips. RBDM differs from aeronautical decision making slightly in that it is entirely proactive, whereas ADM can be "in the thick."

For those who like a more structured approach to things, the following is a good way to apply RBDM. It is not unlike the PAVE checklist that wants you to consider the **P**ilot in command, the **A**ircraft, en**V**ironmental factors, and **E**xternal pressures when stepping to fly:

First, every decision starts with a question, so determine what you have to decide. For example, what if you are scheduled to fly in a few days but there is a chance the weather might turn poor with high winds and low visibility? The question then would be; *Do I still go fly?*

Second, figure out who else is affected by your decision. Do you have passengers you could be putting at risk? Is there a seasoned pilot flying with you who can act as PIC if needed? Is there an aircraft owner who might not appreciate his aircraft returning with a few unwanted dings in it?

Next, identify the external factors that affect the decision. This can often be the most time-consuming part of running the RBDM process. There can be so many factors! This is where the PAVE checklist and good RBDM parallel one another. Your experience, proficiency, health, aircraft equipment, and motivation can really sway a decision in one direction or another. Understanding your motivation for wanting to fly will help you determine whether or not you are aiming to go out and punch holes in the sky or if

you have somewhere you really want to be, like your son's high school graduation. The latter is the kind of external pressure that sneaks up on us if we aren't aware of it. Although the risk doesn't change, sometimes we find ourselves making a poor decision if we believe the price is worth it.

After considering the external factors, determine how likely you are to actually encounter the risk you are trying to mitigate. In this scenario, it is that bad weather. Can you flightplan your way out of danger or is it more likely that weather is going to be a factor, regardless? Lastly, if you decide to proceed with your flight, how severe might the effects of the risk be? What will your options be for remaining safe at that point?

Running through these mental exercises can be an eye-opening experience. Practicing risk-based decision making forces you to stop and consider all of the variables you just might not otherwise. When we make decisions that lead to mishap, the mistake is rarely in our intention. Usually, we just don't have enough information, or we misinterpret what we do know, and that is what causes the mishap. On that note though, if you should get in over your head and commit an error, the Aviation Safety Reporting System (ASRS) is a great way to improve aviation safety by reporting your experiences so that others

might be able to learn from them. Reports sent to ASRS (http://asrs.arc.nasa.gov) are on a volunteer basis and are anonymous — so there is no jeopardy in reporting.

Keep 'er Going

Another thing you can do is keep the safety conversation going. Publications such as this one, *Flying*, *Aviation Safety*, AOPA's *AOPA Pilot* and AOPA *Flight Training*, and EAA's *Sport Aviation*, keep you abreast of all the latest news and issues concerning general aviation. You can get information on the most recent policy changes by attending safety seminars such as those hosted by the FAA Safety Team (FAAST) and the ones held at local and national air shows. Type club meetings and FBO "coffee machine chats" do wonders for building camaraderie, encouraging crosstalk, and can offer great insight on your specific region or aircraft. Know a fellow pilot (or two) who just isn't as involved? Offer them this edition of *FAA Safety Briefing* and start a discussion of your own.

The Last Word …

An aviator friend of mine told me about a flight he intended to make in southern Florida. His route would take him directly over the Everglades and at the time, his intention was to leave early in the morning, right before dawn. While prepping for his flight he noted just how dark it was. He then remembered an article I wrote in the September/October 2015 of *FAA Safety Briefing* about spatial disorientation and the factors that can create the "black hole" effect. My buddy is a highly experienced, night and IFR qualified aviator and yet the situation gave him pause. He decided to delay an hour and wait until the sun was dawning before launching out on his trip. In the end he had a lovely, uneventful flight. This is *exactly* the kind of pause and introspection that we need, and serves as a great example of stellar risk-based decision making.

Part of maintaining a healthy aviation culture is staying engaged. While a "program" has a definitive start and ending date, a *culture* is a philosophy that must be embraced and infused into every aspect of the activity. Safety doesn't happen in a vacuum. It needs to be actively pursued and we all need to take responsibility for it. So I ask you again; How do *you* do safety?

Sabrina Woods is an associate editor for FAA Safety Briefing. She spent 12 years as an aircraft maintenance officer and an aviation mishap investigator in the Air Force.

Photo by H. Dean Chamberlain

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JENNIFER KILEO

Keeping Up with Today's Tech

… without Breaking Any Rules!

A Cessna 182 retrofitted with updated instruments.

Are you thinking about upgrading your general aviation (GA) cockpit but not sure where to start? The many different options for upgrades can leave aviators scrambling to make the right decision on what to pick and when to install. Whether you are a fly-for-fun pilot using free time to explore the many facets of the National Airspace System (NAS) or a pilot who seeks to accomplish day-to-day activities, modernizing your airplane's avionics may appear a daunting endeavor.

When renovating your aircraft, there are many factors to keep in mind as you focus on what products to select. Ask yourself, do I need to address any limitations with my equipment? What product(s) will increase my situational awareness or help manage my workload during flight? How do I distinguish between what I really need, and what is just "nice to have?"

As if that isn't enough, before you make *any* of those decisions, you must also consider the FAA

compliance factors associated with your choice. It's enough to send anyone's mind spinning. We get it. The FAA understands the critical, risk-based decisions pilots must make when deciding to modernize their airplanes to enhance flight safety. That's why we have dedicated resources to simplify the certification criteria for pilots and operators and make it easier to upgrade the cockpit with the latest safety enhancing equipment. Here are just a few of the ways we have been working to ensure your safety and the airworthiness of your aircraft.

Clearing a Path

Just over a year ago, the FAA established a streamlined policy for non-required angle of attack (AoA) indicator systems. The AoA indicator is a supplementary device that alerts pilots to an unusually high angle of attack, so they can avoid an aerodynamic stall that could lead to a spin and loss of

control. Because 40 percent of all GA fatal accidents involve loss of control, the FAA, NTSB, and several aviation industry organizations are all focused on increasing pilot awareness and education. The AoA policy helps by providing a clear path to approval, thereby encouraging owners of GA aircraft to install these safety devices. You can read more about it here: http://go.usa.gov/cxqBz.

Another recent FAA policy statement helps GA aviators replace vacuum driven attitude indicators with electronically driven systems. Found here: http://go.usa.gov/cxqAx, this non-regulatory policy clearly indicates that most direct replacements can likely be done via the minor alteration process. The policy statement provides operators with guidance to install electronically driven attitude indicators, which can decrease costs in maintaining the safety of your aircraft.

These two actions demonstrate how the FAA is changing its approach and breaking down the barriers that prevent pilots and operators from modernizing and improving the safety of their airplanes. In addition to these actions, we are working to rewrite the part 23 aircraft certification regulations to align with a performance based approach. The FAA's intention is to relieve many of the roadblocks manufacturers have encountered when implementing new technologies in product designs. The rulemaking process is lengthy, and we know that is frustrating. But it's important to make sure we get it right. Stay tuned for continued progress on this front.

To Safety … and Beyond!

While we are proud of what we have accomplished so far, our work continues beyond these initiatives. Below are examples of several technologies that have the potential to increase a pilot's situational awareness and help manage workload in both normal and emergency situations. These items are not required, but they fall into the "nice to have" category and contribute substantially to better risk-based decision making.

Fuel Gauge Systems — Known for their simple construction, resistive float gauges are found on most old airplanes. However, over time, corrosion or wear can provide erroneous readings. The construction of a capacitive fuel gauge is more complex, but proves more reliable over time, and provides more accurate information. While upgrading to a capacitive gauge is not required, it does yield "nice to have" benefits like more accurate information

on fuel consumption. The valuable data this instrument provides can assist you in conducting a safe flight. A warning, however; although newer fuel gauges can provide accurate measurement, remember that instrument readings vary with specific gravity and temperature. So, like the old gauges, do not rely *solely* on these gauges as a guide for what's really in the tanks.

Engine Monitoring Systems — Aircraft engines are the most expensive and critical component of an aircraft. Monitoring an engine's in-flight performance is imperative for safety, but this practice can also help save you from costly engine repairs. A quality, multifunctional system can capture accurate engine performance data over time,

The FAA understands the critical, risk-based decisions pilots must make when deciding to modernize their airplanes to enhance flight safety. That's why we have dedicated resources to simplify the certification criteria for pilots and operators and make it easier to upgrade the cockpit with the latest safety enhancing equipment.

Photo courtesy of Avidyne

This is an avionics suite which includes ADS-B equipment.

This MFD screen shows information from an engine monitoring device.

An autopilot control panel.

fuel flow readings, and failure probability and alerts. This non-required equipment adds that next level of safety to aircraft operations and affords you the opportunity to make better decisions about flight safety and personal finances.

Autopilots — Introducing a virtual copilot to your cockpit can help keep you straight and level while accomplishing other tasks like previewing approach charts, monitoring your engine perfor-

mance and fuel flow, and checking on the weather en route and at your final destination. This non-required equipment provides a significant level of enhanced safety.

Primary Flight Displays — A primary flight display (PFD) integrates many individual instruments into a single presentation. An increasing number of newer GA aircraft are equipped with PFDs. The installation of this multifunctional equipment into the existing GA fleet increases situational awareness and simplifies a pilot's workflow for these aircraft. This capability can facilitate better operational decisions.

Risk-Based Decision Making; It Takes Two

Under the FAA's Risk-Based Decision Making (RBDM) initiative, we are using every resource to ensure your safety in the NAS. Providing a clear path to the equipment you need is just one of the ways we are working to achieve this goal. You play a critical role in furthering this initiative.

Civil aviation safety depends on voluntary compliance to legal requirements. While the "nice to have" avionics are just that, there are a few things to consider in order for you to remain compliant with regulations while flying. One of these is the FAA's Automatic Dependent Surveillance-Broadcast (ADS-B) mandate, which has a January 1, 2020 deadline. Equipping with ADS-B Out allows you to broadcast the position of your aircraft. We encourage you to go beyond the mandate, and consider equipping with ADS-B In as well. Doing so affords you both the visibility of other aircraft operating in the airspace

Autopilots make use of trim tabs to help control the airplane.

around you and weather information, increasing your overall situational awareness and your ability to make decisions. It goes without saying that *not* complying with the new requirements of Title 14 Code of Federal Regulations (14 CFR) section 91.227 could restrict your access to certain portions of the NAS after the 2020 deadline.

The FAA believes these avionic upgrades are valuable if installed and used correctly, and the required equipment and its established functions are outlined in 14 CFR parts 23 and 91. These requirements are based on size and operation, and are still applicable when upgrading your airplane's avionics. Choosing a reputable avionics shop and equipment manufacturer can help you determine if your upgrades are compliant with the current performance requirements — including airworthiness directives and service bulletins. These professionals can also advise you on available options and associated costs.

After you have determined how you will modernize your aircraft, remember the importance of training on the proper usage of the new technology and how it integrates with your existing equipment! The best way to remain compliant with the regulations is to ensure you are always keeping abreast of existing requirements, and making time to seek the skills you need to keep you at the top of your game. This could come in the form of formal training with a certificated flight instructor (CFI), or simply a little "hangar flying" for your eyes to get accustomed to finding and interpreting the new data in your cockpit. Once you are proficient with your new equipment, you can rest assured that you are prepared to make the risk-based decisions that will improve the efficiency and safety of your aircraft.

After you have determined how you will modernize your aircraft, remember the importance of training on the proper usage of the new technology and how it integrates with your existing equipment.

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TOM HOFFMANN

In Data We Trust

Does Flight Data Monitoring Hold the Key to Improving GA Safety?

Data are just summaries of thousands of stories — tell a few of those stories to help make the data meaningful.

— Chip & Dan Heath, authors of *Made to Stick*

In today's fast-paced, consumer-driven world, data is king. It auto-populates our shopping lists, keeps our homes at that "just-right" temperature, places our preferred songs and movies a mere finger tap away, and even delivers the occasional reality check when our 10,000 step fitness goals are woefully underachieved. The applications for data use are endless and continue to grow at breakneck speed. And while big data may not be for everyone, there's no denying the advantages of efficiency and convenience that an information-driven society provides.

Given these benefits, as well as how easy it is now to collect virtually mountains of information, it's no surprise to see the aviation industry embrace data monitoring. In fact, it has been leveraging its risk-mitigating might to improve safety for several years. Just look to the success of the Aviation Safety Information Analysis and Sharing (ASIAS) program and its work with the Commercial Aviation Safety Team (CAST) — both joint ventures between government and the aviation industry — to formulate a consensus-based, data-driven approach to improving airline safety.

The proof is in the pudding, as they say, as this collaboration contributed to reducing and maintaining the commercial airline fatality rate at historically low levels. Its proactive approach represented a critical shift in thinking more about what *could* go wrong, as opposed to what did go wrong. At the core of this game-changing approach is the vast amount of de-identified data that is collected from dozens of participating airlines, as well as several other voluntary data sources. Studying this data has helped throw a spotlight on certain problem areas for air carrier flight operations, like terrain warnings or wrong runway landings, and has allowed teams of experts to map out mitigations and SOP changes ahead of there being an accident. It's a brilliant plan that continues to pay safety dividends every day. It's also worth noting that not one participant of ASIAS has left because of misuse of data.

But what about GA flyers? Could we not avail ourselves of this same data collection scheme and become part of a solution to drive down the GA fatal accident rates? That was exactly the topic of conversation at the FAA-hosted GA Safety Summit in 2014. It was later that March when the FAA announced the start of a one-year project to illustrate the value, capabilities, and benefits of the ASIAS program for the GA community. (You can read the FAA's policy statement on the program at http://go.usa.gov/cYkMV) With

GA accident rates holding fairly steady over the last decade, it only made sense to apply a tried and true method of accident mitigation to this segment of aviation. But with GA's vastly different infrastructures, mission mindsets, and operational metrics, the plan wouldn't be without some challenges.

It All Started When …

Luckily, this was not GA's first foray into the world of flight data monitoring (FDM). Although advancements in avionics and portable technology in the last decade or so have made it possible for the average GA flyer to record and review certain elements of their personal flights, these methods lacked the formal structure and prognostic power of anything like the airlines' Flight Operations Quality Assurance (FOQA) programs that would feed reams of information into the ASIAS database. A wayward goose would change all of that.

During a routine night VFR flight in the fall of 2007, a student pilot and instructor, both from the University of North Dakota (UND), were involved in a fatal crash near Grand Forks International Airport (KGFK). Following the accident, and with little forensic evidence to work with, investigators initially attributed the root cause to be spatial disorientation, a phenomena not uncommon to this sparsely populated area. However, anomalies found in the flight data that was pulled from the aircraft's Avidyne avionics suite warranted a closer look at what might have happened. The data revealed a more abrupt pitch up attitude than would normally be associated with spatial disorientation's more gradual loss of control. A second review of the aircraft wreckage revealed some odd dents in the wing which, after DNA testing was completed, confirmed that a migratory goose had impacted the aircraft and caused the crash.

"During the accident investigation, we got several minutes of flight data which proved very useful in understanding exactly what happened to these pilots," says Jim Higgins, Associate Professor of Aviation at UND. "Afterwards we thought, why not take a shot at using this new technology more regularly with GA?" That spurred conversations with both the FAA's Office of Accident Investigation and Prevention (AVP) and the avionics manufacturer, Avidyne, to see how they might be able to more officially pursue that endeavor.

"There wasn't enough maturity in the technology at that time to do much, but we never abandoned the idea," says Higgins. Eventually UND received a grant to lay the groundwork for collecting FOQA-style data for GA and develop a central repository for this data,

which would later be named the National General Aviation Flight Information Database, or NGAFID. Its role: to collect, archive, analyze, and disseminate de-identified flight data to participants and aviation safety researchers. By 2011, and with the help of some folks at Embry Riddle Aeronautical University, the NGAFID was up and running.

For the Love of Data

It is a capital mistake to theorize before one has data.
— Arthur Conan Doyle

FDM offers us one of the best chances to lower accident rates and manage issues ahead of time rather than being reactionary.

With over 500,000 hours of flight data now under its belt, this tool has given UND and other participating universities incredible insight into their flight operations programs. UND's role as operator and maintainer of the NGAFID is to preserve the integrity of the collected flight data, as well as to alleviate concerns of privacy and security from data contributors. In addition, UND has also developed several useful applications of the data to explore ways of improving safety. Collecting data from 86 different parameters allows Higgins and his team to be able to narrow the focus on specific areas that may need attention.

"One thing we discovered using data was that students were landing early on certain runways," says Higgins. "While it wasn't necessarily unsafe, we found that it didn't match up with the stabilized approach criteria that we had earlier established."

When that information was shared among students and instructors, there was a noticeable improvement — UND was able to reduce the early

The University of North Dakota's entire fleet of 72 Cessna 172s are able to upload flight data using the Garmin G-1000.

Photo courtesy of UND

landings, and without the need for a post-accident analysis. Higgins also remarked how monitoring the data allowed the university to detect a creep back towards the original problem, revealing what he calls mitigation decay. "We now know exactly when to revisit these issues," he says.

FDM has also allowed UND to measure the effectiveness of angle of attack (AoA) systems installed in three of its aircraft. Analysis revealed that when turning final, the aircraft nose would typically drop about 0.7 degrees more on airplanes equipped with AoA indicators than on those without. This discovery reinforces the idea that AoA systems help pilots be more keenly aware of proper attitude control on final approach.

These exciting applications for using FDM only scratch the surface of its safety potential. The FAA's PEGASAS (Partnership to Enhance General Aviation Safety, Accessibility, and Sustainability) program

has brought together several universities to further develop the tool's capabilities and make it more accessible to other users. Among those partners is Purdue University, which is working on developing methods to present collected data in more useful ways for the GA community.

Associate Professor Karen Marais of Purdue's School of Aeronautics and Astronautics says she and her co-investigators are looking at all types of users and is working on a survey to find out what metrics and display capabilities pilots will want and how they can more easily make sense of the data they collect. "I am really excited about providing useful analysis capabilities to the pilot who may only go flying every now and then and who does not have access to corporate/flight school type of support," says Marais. In particular, she and her team hope to be able to highlight one of the big advantages of FDM — to show pilots how the community as a whole is doing. "For example, if data shows at airport XYZ that everyone struggles with landings on a particular runway, they'll know to be extra vigilant."

Incidentally, Purdue's flight program is another successful example of FDM in use. Its fleet of 16 Cirrus SR20s comes complete with Garmin G1000 units whose data is regularly extracted to support Purdue's goals of improving safety and training as well as efficiency. In fact, a recent fleet efficiency study at the school revealed a way to increase enrollments, which resulted in a nearly $800 per semester reduction in students' flight fees.

Build It and They Will Come

Things get done only if the data we gather can inform and inspire those in a position to make [a] difference.

— Mike Schmoker, former school administrator, English teacher and football coach, author.

So with several years of research and development in the books and a better understanding on how the NGAFID can help accomplish the reality of an FDM for the GA community, the next step was to take it out for a test drive. That loops us back to the GA Safety Summit mentioned earlier, which set the groundwork for a one year test project with ASIAS. After the FAA and General Aviation Joint Steering Committee (GAJSC) signed a charter, the GA Demonstration Project Team began work on its objectives to "evaluate the value, benefits, and technical ability of ASIAS to assimilate GA data into its processes and
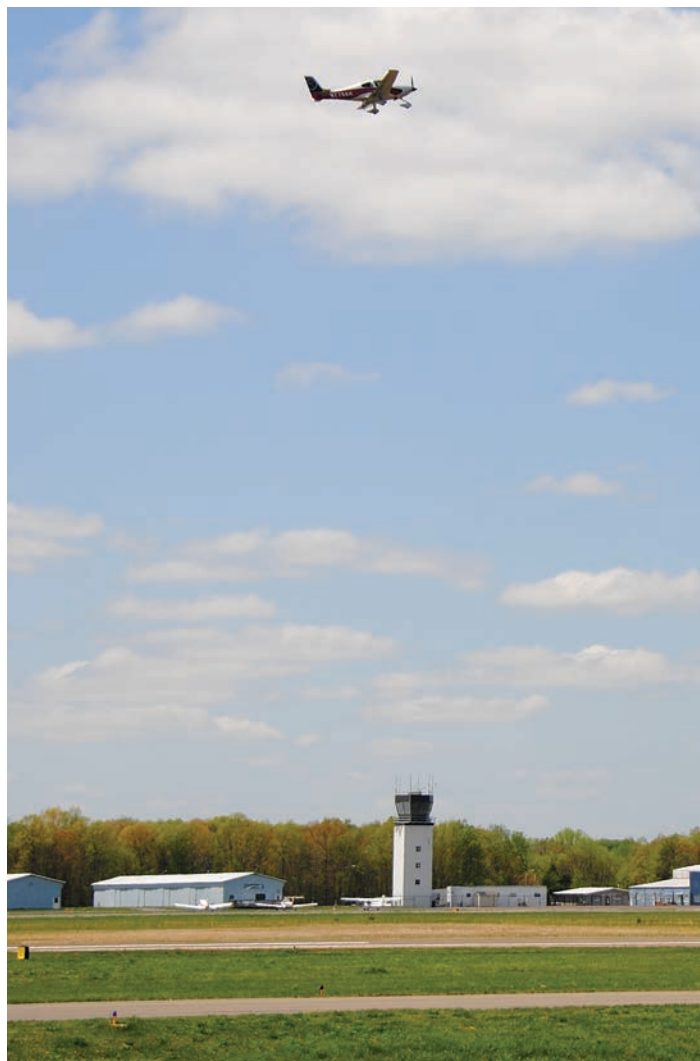
procedures." Participants included members of government, industry, academia, and the GA community.

The team chose the Phoenix area as a test bed for the demo given its diversity in landscape and its good mix of commercial, corporate, and private flight operations. Using targeted outreach, and with help from stakeholder organizations like the Arizona Pilots Association, the team was successful in finding several volunteers for the program who would agree to upload data from their flights. To do this, participants could use a compatible data collection device in their aircraft (e.g., G-1000) or use a MITRE-developed mobile app known as GAARD™ (General Aviation Airborne Recording Device). In addition to providing a means for users to directly upload de-identified flight data to the NGAFID, the GAARD app also provided pilots with the ability to reanimate recorded flight track data for post-flight review. Over time, that flight track data could prove useful for spotting trends and hopefully lead to improvements in personal flying.

For FAA Operations Research Analyst and GAJSC member Corey Stephens, that's clearly one of the goals he hopes to accomplish with this project: to put a powerfully proactive safety tool into the hands of average GA flyers so they can better track how they're flying. Stephens adds that "there's also great value in using that data in aggregate to study trends, validate the work of the GAJSC, and identify future areas of focus."

GAMA Operations vice president and fellow GAJSC member Jens Hennig agrees and believes the GA Demo Project was a successful first step towards that goal. "We've learned a lot so far and have demonstrated areas we can help the GA community," says Hennig referring to the Demo Team's focus on possible airspace redesign efforts and aircraft routing to improve safety. "And based on the initial test results we're seeing at UND, data use is also changing how people fly — everything from ramp safety and taxi speeds, to guidance on approaches and how students are performing in their training"

Next Steps

War is ninety percent information.
— Napoleon Bonaparte, French Military and Political Leader

At press time, the ASIAS for GA Demo team is finalizing a report on its findings for the project and expects to have it available in early 2016 on www.gajsc.org. "Once we're able to assess any outstanding concerns, we'll begin considering a broader role for FDM in the NAS and where we see it going in the future for GA," says Hennig. Among the future goals for FDM includes establishing a baseline of flight parameters and data sampling rates that are sufficient for effective safety mitigation.

In the meantime, the FAA welcomes pilots to join in on the process for safer skies by registering to use the NGAFID so they can begin reporting and tracking their own data. Simply go to www.ngafid.org (or use the adjacent QR codes) to get a user name and password as well as download the GAARD app. Remember that you can also make use of NASA's Aviation Safety Reporting System to anonymously report safety incident information. Go to http://asrs.arc.nasa.gov for more.

"FDM offers us one of the best chances to lower accident rates and manage issues ahead of time rather than being reactionary," says Professor Higgins. "The more the GA community can participate and embrace this technology, the more we'll be able to follow the same safety path as air carriers and with minimum interference to the pleasure and freedom to fly."

Android QR code for GAARD™ app.

iOS QR code for GAARD™ app.

NGAFID QR code.

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

Learn More

FAA Safety Enhancement Fact Sheet on FDM
http://go.usa.gov/cZug5

FAA Fact Sheet on ASIAS Program
http://go.usa.gov/cZugh

PEGASAS NGAFID Project Description Page
www.pegasas.aero/projects.php?p=5

"Total Recall – How FDM Can Help Improve Your Skills,"
Mar/Apr 2014 FAA Safety Briefing
www.faa.gov/news/safety_briefing/2014/media/
MarApr2014.pdf

Evolution and Adaptation

For the past few years, the "evolving role of the regulator" has been a frequent topic in speeches that the Administrator and other senior FAA officials make to aviation community audiences. The newly-announced Compliance Philosophy is certainly part of that evolving role, as is the FAA's Risk-Based Decision Making and tools like Safety Management Systems (SMS).

Since the "role of the regulator" is an important topic for anyone who is regulated I thought it might be helpful to devote this space to explaining how the evolving role of the regulat*or* — the FAA — leads to the evolving role of the regulat*ed*.

Proactive Problem-Solving

The FAA's traditional approach to compliance is based on the assumption that if an airman or organization is fully compliant with the applicable regulations, then we've achieved safety. Based on that assumption, we have traditionally provided oversight primarily by checking a certificate holder's conformity with the regulations and reviewing technical processes. The agency used enforcement as the primary tool to gain and sustain compliance.

We have come to realize, though, that following the rules is one of those "necessary-but-not-sufficient" activities. It's not possible to make enough rules to cover every conceivable circumstance. So compliance means not just following the rules, but also going beyond the rules — taking proactive measures to find and fix problems, and effectively managing the risk they create in the system.

The FAA has also recognized that the greatest systemic safety risk doesn't come from a specific event or its outcome, but rather from intentional non-compliance, or lack of cooperation in correcting the problem.

That's why the FAA needs to change how it operates. We can't keep doing the same job the same way we did it ten years ago, because it's not relevant to the aviation community the agency oversees.

Risk-Based Decision Making & Safety Management Systems (SMS)

That is the reason for Administrator Huerta's strategic initiative for Risk-Based Decision Making, which is about using data to evaluate risk, and then targeting resources to address the areas of highest risk.

Risk-Based Decision Making relies heavily on tools such as the Safety Management System (SMS) approach. Properly implemented, SMS fosters a strong, voluntary safety culture and focuses more clearly on risk. It also provides the structure and the tools to mitigate risks not specifically covered in the regulations.

In a very fundamental way, SMS shifts the oversight burden from regulator to certificate holder, with the FAA using the tools and the framework that SMS provides to focus on safety assurance. The FAA expects certificate holders — be they large operators or single pilots — to develop and implement risk controls appropriate to their operational environment. That includes reporting, so that we can collaboratively find and fix problems before they cause an accident or incident.

Compliance Assurance

Finding and fixing problems is the core goal of the FAA Administrator's Compliance Philosophy Order, which is the enabling guidance for the agency's risk-based decision making approach to compliance.

The Compliance Philosophy establishes the framework for two big things. First is using the information we get through open communication — part of SMS — to get to the root cause of problems in the NAS. The FAA expects certificate holders to identify safety issues, take steps to correct the issue, and adopt measures to ensure the non-compliance does not occur again.

Second is using that information to determine the most appropriate and most effective tool to fix those problems and make sure they stay fixed.

Culture change takes time, but here's what the FAA is working to do under the new approach: When deviations occur, the agency starts with analyzing the facts and using interdependence and critical thinking to ensure outcomes consistent with regulations and facts of a specific case. If deviations arise from factors such as flawed procedures, simple mistakes, lack of understanding, or diminished skills, the most effective way to fix the problem is through working collaboratively with the certificate holder to fix the problem in a sustainable way.

The culture change certificate holders need to make is to be willing and able to comply, and also to collaborate with the FAA to find and fix problems in the system. It will take time and adjustment on all sides, but I'm confident we can get there.

JEFFREY SMITH

Compliance Philosophy within General Aviation
FAA's Evolving Culture on Aviation Safety

They may be referenced formally as Title 14 of the Code of Federal Regulations, referred to colloquially as the Federal Aviation Regulations or FARs, or simply noted as "the rules." Whatever you call them, regulations are intended to be risk controls and thus a critical safety component of the National Airspace System (NAS). Therefore adherence to the regulations, and the FAA's obligation to enforce them, are important to all general aviation (GA) participants. The following is a little bit about what the expectations are under the FAA's new Compliance Philosophy policies and what we all can do to promote the safest aviation system possible.

First, some "big picture" background. The Compliance Philosophy plays a significant role in the FAA's strategic initiatives. As you will find on the FAA Plans & Reports webpage (https://www.faa.gov/about/plans_reports/) these initiatives are designed to "lay the foundation for the aerospace system of the future." In this edition of *FAA Safety Briefing*, we have introduced different aspects of Compliance Philosophy so that you might better understand our role, and your role in it.

Why the need for the change? Most of us would likely agree that GA operations are reasonably safe, however, improvements can always be made. Technological advances in airspace, aircraft, training, etc., are continuing at an increasing pace. While the regulations provide a minimum foundation for safe operations, they simply cannot keep pace with changes happening in aviation. If we do not change our perspective on how we comply with the regulations, the ability of GA to maintain and improve upon the existing safety record will not be possible.

As Sabrina Woods penned in her "How do You do Safety?" article, our previous system was largely focused on finding a problem through an accident, incident, or other occurrence and then fixing that problem before continuing on. Many aircraft checklist items, maintenance procedures, certification standards, operating procedures, and certainly regulations have been created through this process. Of course, the FAA and industry puts these items in place in order to prevent the event from repeating. While this method has brought us to where we are today, in order to advance to the next level of safety we need to identify and address problems *before* an accident or incident occurs.

So how does the Compliance Philosophy help achieve this higher safety goal? Essentially, it calls for both the FAA and industry to focus on finding problems early, applying the best fix, and taking the appropriate steps to ensure the problem remains fixed. With this background in mind, let's look at several interlocking parts of the Compliance Philosophy.

The Role of the Regulator

The FAA has a statutory obligation to prescribe, revise, and enforce aviation regulations. And when most of us think about traditional methods of how the FAA addresses violations of the regulations, things such as civil penalties, and certificate suspensions or revocation probably come to mind. However, the Compliance Philosophy recognizes that enforcement is only one option when dealing with a violation of the regulations. While the FAA will still use enforcement when necessary or required, additional tools, called compliance actions, are also available. The FAA can use compliance actions, instead of enforcement actions, for many deviations that occur. The following list demonstrates how differing violations may be viewed by the FAA in terms of enforcement, compliance, and other actions:

- For violations resulting from flawed procedures, simple mistakes, lack of understanding, or diminished skills:
  - Compliance action, which includes:
    - On-the-spot correction
    - Education
    - Additional Training
    - Counseling
    - Improvements to systems, procedures, and training programs

- For violations resulting from intentional, reckless, or criminal acts; failure to adhere to agreed-upon corrective actions; repeated violations:
  - Enforcement action, which includes
    - Warning letters
    - Formal letters of correction
    - Suspension
    - Revocation
- Matters involving qualification or competence
  - Compliance action
    - Remedial training
  - Reexamination
  - Enforcement action

The new policy does not mean that the FAA is getting softer on compliance. Instead, the intent is to use the most appropriate tool to fix a safety issue. The FAA recognizes that not all safety problems are caused by intentional non-compliance with regulations. Rather, they may be due to flawed procedures, simple mistakes, lack of understanding, or diminished skills. However, all violations, even the small ones, must be addressed as part of maintaining the expected level of safety in the NAS.

Education will continue to be emphasized as a means to promote safety. In particular, this includes an understanding of risk and methods of positive, effective compliance. As described in more detail further on, the FAA seeks to work together with organizations and airmen in an interchange of information and action that uphold regulatory compliance.

Figure 1 provides a simplified overview of the process that aviation safety personnel within the FAA will use when addressing non-compliance:

A Transparent Exchange

A crucial element of the Compliance Philosophy involves a transparent exchange of safety information. While it may be intimidating to speak with the FAA, there is good reason why a safety inspector will ask you questions about an apparent deviation from the rules. In gathering facts about the event, the inspector is carrying out their duty to investigate, analyze, assess the situation, and, ultimately work with you to develop a fix for the problem.

The FAA will use information acquired on multiple levels. On the smallest scale, the safety inspectors will discuss the situation with the responsible
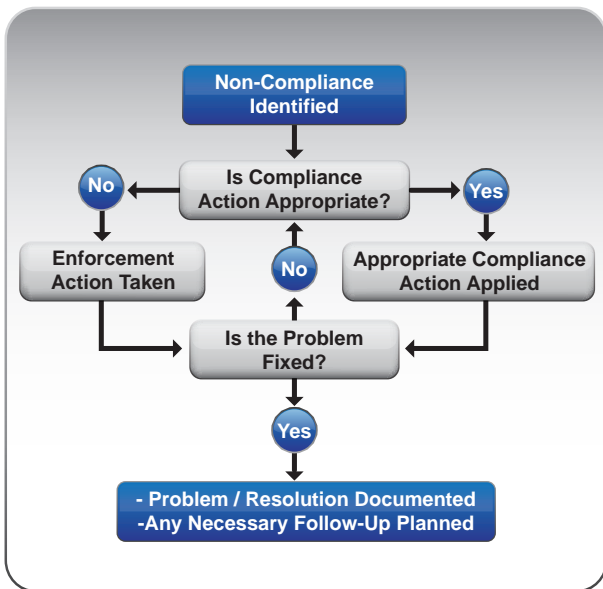
Figure 1. Overview of process to address non-compliance.

person. Immediate notification and action will be taken to mitigate any significant safety hazards and ongoing operational risks.

On a larger scale, the FAA can use aggregated data when attempting to determine if a systemic problem is at hand. Examples may include issues at an airport, difficulties with a particular aircraft, certification standards or handbook information that require updating, or even the need for an amendment to the regulations.

The FAA may also use information as part of collaborative government and industry initiatives, such as the General Aviation Joint Steering Committee or to build courses on FAASafety.gov, courses provided by other safety organizations, safety forums, online or printed articles, etc. This exemplifies the other side of the exchange of safety information that is crucial in adequately identifying and addressing the hazards and risk in our activities.

A Quick Look at Safety Management

The FAA cannot directly oversee all aspects of aviation activities. This is a product of the wide variety, and large amount, of GA operations we enjoy in the United States. Of course, regulatory compliance is expected and required of everyone. Our civil aviation depends on — and the FAA expects — voluntary adherence to legal requirements. In addition, the FAA expects that you will maintain the knowledge and skills required for the privileges you are exercising.

In order to achieve a better safety record, we must go beyond the minimum of simply complying with the regulations. Instead, we need to take proactive measures to identify and address safety issues. Also, it would be impractical to write prescriptive rules for every possible risk. That's where each of us, whether as individual airmen or large complex organizations, must integrate compliance into our safety management practices.

Most of us utilize safety management on some level, even if we are not aware of it. Prior to flight we naturally think about the regulations (and other safety standards) that will apply to the operation we are going to conduct. We then project whether or not we will be able to operate within the boundaries of the regulations. If we determine that we will not be in compliance, we take the steps necessary to correct the problem prior to the flight.

We can use regulations and standards, and skills that we already have, to control for risk. The key is making it part of our normal routine, and this is where the principals of safety management come in. Even without the structured processes of safety or quality management systems, you can still monitor your activity for compliance. The use of personal minimums and practices, memory aids (such as IMSAFE and PAVE), pre-flight preparation checklists, or simply personal habits can work. Using such tools, and continuing to evaluate their effectiveness for your activities, reflect the safety management principles that are critical to the Compliance Philosophy.

As an example, assume you are planning a night flight with passengers. You would likely think about the night takeoff and landing currency required by 14 CFR section 61.57(b). You might even go beyond the regulatory requirement and consider whether or you not you feel you are proficient with night landings considering the projected weather, airport, and aircraft you plan to use. [Of course, having read the November/December 2015
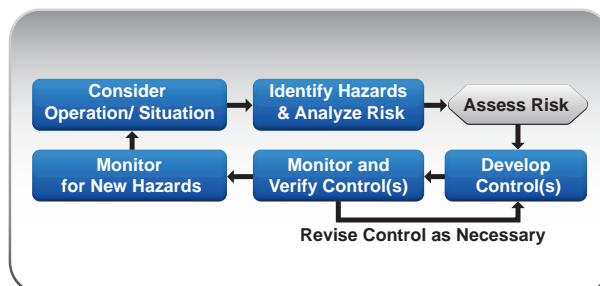

Figure 2. Safety Management Overview

edition of the *FAA Safety Briefing*, which focused on night flying, helped you in your analysis.] If you do not meet the currency requirements or do not feel proficient, you would take steps to correct the deficiency. This might include obtaining additional instruction prior to the flight, postponing the flight until better weather is forecast, or switching to an aircraft with which you are more familiar.

After the fight is over you should conduct self-review. The purpose is to determine if your flight preparation was adequate to identify hazards and analyze the risk. If not, and you realize you did not properly consider an aspect of the flight, that piece will need to be added to your preparation for subsequent flights. Perhaps you did not realize that the runway in use had a tri-color approach slope indicator. Being more familiar with the precision approach path indicator, you wish you would have refreshed yourself on the indications of the tri-color system. To prevent this for future flights, you add checking your electronic flight bag for information on airport lighting as part of your flight preparation tasks.

Cultural Evolution

The Compliance Philosophy does not represent a revolution. Rather, it's an evolution of existing practices for both the FAA and GA community. This evolution, however, will require some cultural change for both parties in order to be fully successful.

One cultural change required is recognizing that adherence to safety management principles, and our willingness and ability to comply with the regulations, are necessary to control for safety risks.

It seems intuitive to link the outcome, such as an accident, incident, or negative finding during FAA surveillance (such as a ramp check), as requiring the strongest corrective action. In parallel, it is natural to conclude that a flight that ended without occurrence does not necessitate any changes in procedure. The Compliance Philosophy requires this mindset to change.

Certainly, an accident, incident, or surveillance may reveal behaviors that need to be addressed. Most of the time, the person involved is willing and able to make corrections that prevent future reoccurrence. By taking needed measures, they adequately control for future risk. In contrast, someone who refuses to take action to prevent future reoccurrence presents the greatest safety threat. Regardless of their previous flights, this person will continue to violate the regulations, or will remain unable to meet the standard, until a negative result eventually occurs.

Therefore, we always need to ask ourselves not just did we comply with the regulations, but *how* did we comply? Did we adhere to the requirements, but only inadvertently through luck and circumstance? If so, it may be only a matter a time before those circumstances change and we find ourselves out of compliance. We should use safety management principles to ensure our continued compliance with the regulations.

Managing the Changes

As noted at the beginning of the article, the FAA considers the Compliance Philosophy an essential part of the aviation system of the future and is taking it very seriously. FAA's Flight Standards Service (AFS) is utilizing change management to ensure adoption and utilization of the updated policies and procedures. Change management involves a formalized and structured approach that focuses on the people side of the change. AFS has utilized online training courses, workshops, messages to managers, and internal town-hall style discussions to help the workforce with the changes.

The outreach for Compliance Philosophy will only broaden as external communications and involvement expand. As you probably concluded, this *FAA Safety Briefing* edition is part of the outreach. Be on the lookout for additional opportunities to learn about this topic. In the meantime, you can read up on the Compliance Philosophy using the resources listed in the Learn More section below:

Jeffrey Smith is the manager of the FAA's Airman Training and Certification Branch. He holds an ATP certificate, is a flight and ground instructor, and is certificated as an A&P mechanic.

Learn More

Flight Standards Service Compliance Policy / Philosophy

FAA Notice 8900.323:
http://go.usa.gov/cZu2R

FAA Order 8900.1, Volume 14, Chapter 1, Section 1:
http://go.usa.gov/cZu2d

Remedial Training Guidance and Procedures

FAA Notice 8900.325:
http://go.usa.gov/cZu2F

Flight Standards Service Compliance Action Decision Process

FAA Order 8900.1, Volume 14, Chapter 1, Section 2:
http://go.usa.gov/cZuTT

Checklist Compliance:
Your "To-Do" List for Aviation Maintenance

Picture this: your best client walks in the door to hand over the keys to her most prized possession — a lovely Cirrus SR20. It is due for its annual inspection and she also reports a slight flutter in the left aileron, some funny business with the door not wanting to fully close, and an Airworthiness Directive (AD) that is due for compliance. Lingering in the back of your mind is the knowledge that you will also have to deal with the parachute that comes standard with this model of aircraft. After a few moments of deep introspection, you dust off your workspace and get down to business. It's time to break out and review the "to-do" lists for aviation maintenance.

Checklist Mentality

14 CFR section 43.15 states that each person performing an annual or 100-hour inspection shall use a checklist. This can be of your own design as a certified aircraft maintenance technician, or taken from the manufacturer, as long as it encompasses all of the items found in Appendix D of the regulation. Regardless of where it started, your inspection checklist is not a dormant product and will never be a "one size fits all" resource. Rather, think of it as a living document that should change as aspects of the aircraft change or are upgraded. The part 43 Appendix D checklist is only a starting place and is rarely adequate for a complete and proper inspection.

Not only should inspection checklists include items from the airframe and powerplant manufacturer, but also the instructions for continued airworthiness (ICA) inspections required by accessory manufacturers, ICAs associated with any supplemental type certificates applied to the aircraft, as well as the ICAs found in any major repairs and/or alterations done to the aircraft. In addition, your annual inspection checklist must contain the discrepancy items, special request checks, and inspection/check items that are provided by the owner/operator (e.g., that left aileron). One other area of inspection that is often forgotten is the ICAs for the avionics. This is especially important in the latest generation of general aviation aircraft that have multi-function displays and upgraded pilot interfaces.

There are so many things to consider in an inspection: from examining the condition of the skin and internal structures of the aircraft, to inspecting the ducting, wiring, hoses, and clamps, to ensuring the engine is running smoothly and the flight and engine controls move as they should. Trying to commit all of that to memory is a bit of an exercise in futility and wholly unnecessary. A checklist takes the brainpower you expend just trying to remember things and frees you up to remain more aware of the other parts of the process. A good checklist is also a solid deterrent against the errors that can occur when complacency creeps in.

Once the maintenance is done, the last thing on your list should be to follow up with aircraft log documentation. Not only is log-keeping compulsory, it is also an integral part of the maintenance to-do process. The log book reflects the history of the aircraft and serves as an archive of everything that has ever been done, inspected, repaired and upgraded over time. Neat, timely, and accurate log book entries not only certify that the aircraft is good to go, but they also make it even easier to troubleshoot should something occur later on.

Personal Minimums

Applying a "personal minimums" checklist isn't just for pilots. Every time you approach a task asking yourself a few of these questions is a good idea:

- Do I have the technical data and tools to perform the task?
- Have I performed the task previously and is

it familiar to me?

- Am I mentally, physically, and emotionally prepared?
- Do I have proper personal protection equipment on and/or available?
- Do I have the proper training to accomplish this task? (more on this one later)

And after the task consider;

- Was the task performed in accordance with the technical data?
- Was I able to take my time and perform the task without distraction, external stress, or pressures?
- Did I comply with operational checks and record all entries in the log book?
- Did I or someone else double check my work?

These are just some highlights but the FAA Safety Team has a complete Maintenance Personal Minimums Checklist and offers classes that count towards AMT credit. All of this can be found on their website at www.FAASafety.gov.

Your inspection checklist is not a dormant product and will never be a "one size fits all" resource. Rather, think of it as a living document that should change as aspects of the aircraft change or are upgraded.

Time to Get Cirrus

All puns aside, occasionally you might encounter something that you are just not confident or even qualified to do. For instance, the ballistic recovery system (parachute) on the Cirrus SR20 poses just such a situation. The system must be repacked every 10 years and any repair or modification must be accomplished by a licensed repair facility. So if you aren't certified to handle specialty items such as this one, then DON'T. There is no shame in lacking experience in something, and it is best to pass such items along to one who is more knowledgeable. Part of a good checklist might also be in knowing whom to contact for back-up when needed.

Well-intentioned, experienced, and motivated technicians can still make mistakes. These mistakes have directly contributed to in-flight emergencies and accidents. Like any other tool, the checklist is just no good if you don't pick it up and use it the whole time, every time. Maintaining and running a checklist before maintaining and running the aircraft will keep your client's bird (and your client) flying safely for a long time to come.

Sabrina Woods is an associate editor for FAA Safety Briefing. *She spent 12 years as an aircraft maintenance officer and an aviation mishap investigator in the Air Force.*

Federal Aviation Administration

Maintenance "Personal Minimums" Checklist

Before the task

- Do I have the knowledge to perform the task?
- Do I have the technical data to perform the task?
- Have I performed the task previously?
- Do I have the proper tools and equipment to perform the task?
- Have I had the proper training to support the job task?
- Am I mentally prepared to perform the job task?
- Am I physically prepared to perform the task?
- Have I taken the proper safety precautions to perform the task?
- Do I have the resources available to perform the task?
- Have I researched 14 CFR to ensure compliance?

After the task

- Did I perform the job task to the best of my abilities?
- Was the job task performed to be equal to the original?
- Was the job task performed in accordance with appropriate data?
- Did I use all the methods, techniques, and practices acceptable to the industry?
- Did I perform the job task without pressures, stress, and distractions?
- Did I reinspect my work or have someone inspect my work before return to service?
- Did I make the proper record entries for the work performed?
- Did I perform the operational checks after the work was completed?
- Am I willing to sign on the bottom line for the work performed?
- Am I willing to fly in the aircraft once it is approved for the return to service?

HQ-023906

FAA Safety Team | FAASafety.gov

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@FAASafetyBrief

Being a Better Wingman

I find myself in an interesting position. My day job is here at FAA Headquarters as a writer for *FAA Safety Briefing*, but I'm also a pilot and a UAS hobbyist. While there's usually some overlap between two of those factors, an overlap in all three isn't that common.

One thing I consistently encounter when talking with folks in the UAS hobby world who don't have an aviation background is a general lack of understanding for how things operate in the NAS. These are generally well-intended people who just don't know there are rules. They would happily comply, but their lack of knowledge on airspace rules makes their activities a potential safety issue. There are always a few who are not so well intended, but for the majority of people out there, the last thing that they want is a conflict with another aircraft. That's where a little bit of education can go a long way.

Education on the "Fly"

From time to time I find myself in a position to offer some supportive advice when I run into UAS folks in person or online. By doing this in a constructive and polite way I hope to accomplish two things:

The first is to provide some education about the airspace rules and procedures that might help UAS operators avoid a conflict with manned aircraft. The second, more subtle objective is to humanize the people in those aircraft. Sometimes it is too easy to disassociate the aircraft flying overhead with the people that are inside them. By reminding people of that, I hope to invoke their natural empathy to help protect one another.

Another issue that I come across is that people who aren't from an aviation background often don't have a very good idea where airports are. They may know where the large commercial airports are, but are less likely to know where the smaller GA airports are located. To combat this, some UAS have built in databases to warn operators of airspace restrictions. Some can even prevent the UAS from taking off. While some UAS operators complain that these systems are an annoyance rather than a safety feature, they are critical to helping keep aircraft and UAS operations safely separated — especially as UAS numbers continue to grow.

Although safety is the main objective, another reason pilots should support proper use of airspace by UAS operators is that it grows the GA community. Some of those who start out as UAS operators may one day become pilots or contribute to the GA community in other ways.

Direct to the Fix

The best way to help people is to direct them to resources that will help them get on board with being a part of the system instead of accidentally becoming a threat from outside of it. The FAA's UAS page: www.faa.gov/uas/ is filled with resources for people interested in flying UAS for fun as well as for those looking for authorization to fly commercially. The page also includes information on section 333 exceptions which may be required even if you're not being compensated. For those who are more interested in checking it out for hobby use, the more specific address would be: www.faa.gov/uas/model_aircraft/. There is not a better source for UAS operations information than the FAA's UAS page.

The next resource I recommend is the "Know Before You Fly" page at knowbeforeyoufly.org/. This campaign is a partnership involving the FAA, UAS manufacturers, aviation user groups, and even UAS users to help people avoid conflicts and safely operate UAS in the NAS. The site provides lots of useful information including safety guidelines, best practices, and where to find other resources across the UAS landscape.

In summary, drones are the next big thing in the NAS. We all need to do our best to become part of the culture that keeps our skies safe. By being better and more supportive wingmen to our fledgling fellow aviators, we might just be able to help those hundreds of thousands, perhaps even millions, of UAS operators in the NAS to fly safely. By doing so we help make our own environment safer while building a larger coalition of people actively involved in aviation. That's a win-win for everyone.

> **Some of those who start out as UAS operators may one day become pilots or contribute to the GA community in other ways.**

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

SMS?! We Don't Need No SMS!

Guilty as charged, you've got me. I haven't always been the biggest supporter of safety management systems (SMS) for general aviation (GA) and small operators. SMS always seemed elephantine and unwieldy, and I doubted how usable it would be in "real life." But as I've learned more and the program has evolved, I see how SMS — or perhaps more appropriately SMS principles — can be just as applicable to an R-22 on a hundred dollar hamburger run, as they are to the part 121 airline. Core concepts of SMS like commitment, non-punitive introspection, risk analysis and mitigation, and adherence to standard operating procedures (SOP), work no matter the size and scope of your operation.

Walk Before You Run

It's important to understand where you are and what you're looking to accomplish before you establish any SMS program or implement any SMS concepts. You may find that you already have some of the needed components in place. Things like operations manuals, standard operating procedures, training objectives, and aircraft maintenance procedures are a good foundation to build on. The goal here is to provide a process that works for you; not a process that you have to work for. This makes it easy for employees to buy in and be a part of the solution instead of working against it.

The Flight Risk Assessment Tool (FRAT) is a great tool for making go/no-go decisions.

One of the keys to SMS is risk management. This means examining hazards and analyzing how to best mitigate that risk. This concept can be applied to many aspects of operations, from in flight, to maintenance, and even to training. These are largely just good ideas — no one ever wants to have an accident or incident — but SMS can provide a platform to help refine your procedures and manuals to avoid or mitigate risks as you identify them. This leads to the next question.

Where to Start?

As the riddle goes; How do you eat an elephant? The answer is "one bite at a time." The same principle holds for starting with SMS. To provide you with a launch point, the United States Helicopter Safety Team (USHST) has some helpful suggestions.

USHST suggests starting with just two vital steps. First is top management commitment. This element is vitally important as SMS is a cooperative process that requires a non-punitive reporting culture. This commitment could be a simple one-page document signed by an accountable executive (i.e. CEO or owner). This is essential as it provides the clear top level support for those assigned to carry out any implementation. Without that support the responsible parties could feel (or be) undermined. It should include four topics: what you are committed to, how you intend to fulfill that commitment, who's responsible, and the establishment of a non-punitive reporting culture.

Second, introduce a Flight Risk Assessment Tool (FRAT). FRATs are a great tool for making go/no-go decisions. They act as a preflight checklist of potential hazards, risks, and mitigations. Having a FRAT obliges crews to examine elements in several categories and combine them to determine how much risk the specific flight might pose. The elements could include factors like type of flight, experience level of the crew, human factors like fatigue, aircraft condition or status, environmental conditions like weather, and landing zone conditions, to name a few. By examining each of these factors and combining the risk scores you can quantify the risk of a flight and propose mitigations, or scrub the flight entirely if acceptable mitigations can't be found.

Let's say the weather is marginal and the aircraft lacks IFR equipment. Those risks might be mitigated by shifting the time of the mission to a period of better weather, or substituting an IFR equipped aircraft. The FRAT may be a simple paper tool or an electronic checklist. FRATs should be completed before every flight. The completed FRAT should also be retained centrally so the data can be analyzed later to see where you might be able to improve your operations based on what risks you face most often.

With these two steps in place you have started down a road toward a safer and better operation. As time goes on you can look at what other steps you might want to implement. For more information on SMS in the rotorcraft world you can visit the USHST page at http://www.ushst.org.

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

Flight Forum

ADS-B, or Not to Be?

I understand the limits of non-ADS-B equipped aircraft come 1.1.20; i.e. no Class A, B, C (including above/below the lateral limits) and not above 10,000' (except 2500' agl) The question I have is, what about operating IFR in the allowable airspace without ADS-B? I realize VFR is okay in that airspace but just wondering about IFR operations.

For example, I wish to fly from an uncontrolled airport to another uncontrolled airport (or even Class D airports) and at no time will I fly above 10,000' or get near Class B/C airspace. Obviously VFR will be okay but what about an IFR operation? I'm guessing not since a transponder is required for IFR operations.

Thanks — I enjoy the *FAA Safety Briefing* articles.
— Barry

Great question! This is an airspace rule that does not apply to any type operation outside of the defined airspace. That means that the requirements of 14 CFR 91.227 apply to the airspace defined in 14 CFR 91.225 regardless of whether the operator files VFR or IFR. If an operation does not traverse ADS-B rule airspace (14 CFR 91.225), then the aircraft doesn't need to be ADS-B-equipped.

Got Weather?

I am a recent recipient of a private pilot certificate and just finished reading your article, "I've Got Weather!" (in May/June 2015 edition). I just wanted to thank you for writing the article and for your references to the two aviation weather books. I am at the stage in my training where I know there is so much more to learn and my minimal depth of knowledge of the makers and shakers of "weather" is a major concern for me as a new pilot. Like you, I know I should and must learn more about aviation weather and your article was very helpful to me. Thanks again for publishing it. I will be keeping an eye out for your other works in the future. Safe flying!
— Don

Congratulations on your new pilot certificate, and thanks very much for your feedback. The FAA Safety Briefing team works hard to provide relevant and interesting safety information to our fellow aviators, and it's always nice to know when we've hit the mark.

As you saw in the article, we can certainly relate to your recognition of the need to keep learning about weather. We are glad the piece provided some helpful pointers, and we wish you all the best as you continue to fly and learn!

New Endorsement Coming?

At some point, will pilots who train solely in aircraft with fully digital/all-glass flight decks eventually be required to get an "analog instruments" sign-off to fly non-fully-digital/all-glass-equipped aircraft?
— Chad

Hello and thank you for your question. At this time, the FAA has no plans to require an analog instrument endorsement.

FAA Safety Briefing welcomes comments. We may edit letters for style and/or length. If we have more than one letter on a topic, we will select a representative letter to publish. Because of publishing schedule, responses may not appear for several issues. While we do not print anonymous letters, we will withhold names or send personal replies upon request. If you have a concern with an immediate FAA operational issue, contact your local Flight Standards District Office or air traffic facility. Send letters to: Editor, *FAA Safety Briefing*, AFS-850, 55 M Street, SE, Washington, DC 20003-3522, or email SafetyBriefing@faa.gov.

Let us hear from you — comments, suggestions, and questions: email SafetyBriefing@faa.gov or use a smartphone QR reader to go "VFR-direct" to our mailbox. You can also reach us on Twitter @FAASafetyBrief or on Facebook — facebook.com/FAA.

Attitude Is Everything

The longer I live and fly, the more I realize just how important it is to have the right attitude — and I'm talking about a lot more than just keeping the blue side up on the airplane's attitude indicator. As you have read in other articles, the right attitude is a very important element of the FAA's Compliance Philosophy approach to assuring continued safety for everyone who operates in the National Airspace System (NAS).

A Sharper Focus

While Compliance Philosophy puts it in sharper focus, the focus on attitude is not new. Not long after I got my private pilot certificate (but long before I started working for the FAA), I toured the tower of a major airport with friends from the Ninety-Nines (International Organization of Women Pilots). Like many new and, likely, more than a few not-so-new pilots, I was very intimidated by those scary faceless people on the other side of the microphone. I just knew they were eagerly waiting to pounce on any and every mistake I might unwittingly make with my hard-earned license to learn. So I was both surprised and reassured by the tower chief's response to a fellow Ninety-Nine's question about how ATC handles such events. (And no, I didn't plant the question.)

The right attitude is a very important element of the FAA's Compliance Philosophy approach to assuring continued safety for everyone who operates in the National Airspace System (NAS).

"We're not out to get you," he stated. "Among other things, why would we want to do all the paperwork without a really good reason?" The tower chief went on to say that unless the pilot's mistake —"deviation" is the official term — is one that requires official ATC action, controllers much prefer to correct problems by talking to the pilot and ensuring that he or she understands how to avoid repeating the mistake. It ends then and there, he observed, unless the pilot "cops an attitude." In that case, ATC will quickly forget its aversion to paperwork and take a much less friendly approach to ensuring compliance with the rules.

A Sustainable Fix

I got a personal demonstration of this principle a couple of years later. On a trip from home base to Elizabeth City, N.C. (KECG), ATC kept me high a lot longer than I had anticipated, and it was a bit of a challenge to get the airplane from 7,000 MSL to the 1,511 MSL traffic pattern altitude in the remaining distance. The tower controller assigned Runway 10 for landing, which would have put me on a left base entry. For whatever reason, though, I "heard" him tell me to expect Runway 1. I suspect it had something to do with the ongoing descent and configuration flurry, and I remember thinking that Runway 1 was *perfect* because a downwind to Runway 1 gave me a little more time to get the airplane (and myself) ready. I nailed the traffic pattern altitude just as I entered the downwind for Runway 1, and I was breathing a satisfied sigh of relief when a little voice in my head clued me in to the earlier "mishearing."

Right about the time my thumb went for the push-to-talk switch to clarify, the tower controller called to ask if I realized my clearance had been for Runway 10. I immediately and humbly confessed, offering to go around and set up for the correct runway. "That's okay," came the response. "No conflicting traffic, so cleared to land Runway 1. That happens sometimes around here; just be more careful next time." I did file an Aviation Safety Reporting System report (aka "NASA report") both as "insurance" and to help other pilots learn from my lapse.

I've never forgotten the lesson and, thanks to the addition of a disciplined write-it-down procedure, I've never even come close to repeating the mistake. It also strikes me as a good example of meeting the core goal of the Compliance Philosophy's approach: find the problem, and use the right tools to fix it in a way that keeps it from happening again. I'm glad to see this new development, and I hope you are as well.

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

PAUL CIANCIOLO

FAA Faces

Jeffrey Smith

Detail to the Office of the Director for Flight Standards

Jeff Smith, with his daughters Avory and Ashlynn.

The success of the FAA's Compliance Philosophy approach to aviation safety oversight depends heavily on the people who must carry it out on a day-to-day basis. That's where Jeff Smith comes in, as he is deeply involved in the ongoing Compliance Philosophy "change management" process inside the FAA.

"The formalized change management process is about getting training and communication to help people with the transition into the new policies and procedures," he notes.

Jeff, no stranger to the general aviation community, is ideally suited to this task. He has been flying since college, where he first worked refueling aircraft in Chapel Hill, N.C.

After college, Jeff earned commercial pilot and flight instructor certificates, and he started flight instructing in the Charlotte area. After a year and half of instructing, he and his wife moved to south Florida. Jeff continued to flight instruct while also going to school for an Airframe and Powerplant (A&P) mechanic certificate. He ran a flight instruction and rental facility before applying for a job with the FAA.

"One of the maintenance aviation safety inspectors at the South Florida FSDO [Flight Standards District Office] in Ft. Lauderdale told me about a bid for a GA operations inspector position," Jeff said. "I applied and was offered the job. It was a very difficult decision to make because I really enjoyed flight instruction and running a business. However, I figured that I could continue to work with the local GA community as an FAA employee. The stability made it a good personal choice for starting a family."

At the FAA, Jeff eventually became an assistant principal operations inspector, with oversight duties including designated pilot examiners and pilot schools. He also conducted flight instructor check rides and proficiency checks for part 135 commuter and on-demand operations. After three years at the FSDO, Jeff took a position at the FAA's General Aviation and Commercial Division where he worked in the Airman Training and Certification Branch.

With the Compliance Philosophy in the works, earlier this year Jeff accepted a detail to the Flight Standards Service director's office to help with the FAA's formal change management process for this important initiative. Among other things, Jeff has worked on Compliance Philosophy revisions to FAA Order 8900.1, which provides guidance to aviation safety inspectors, and messages to communicate all aspects of the new policy to FAA employees.

Jeff's real-world GA experience makes him a strong believer in this approach. "In many cases, the best fix for the problem is not enforcement," notes Jeff. "Instead, counseling and additional training may be best to address the issue and help prevent reoccurrence in the future. The Compliance Philosophy focuses on how participants in the National Airspace System ensure compliance, rather than just a determination on if they comply."

GA is challenging because of the large number of operators, a wide variety of activities, and relative freedom of operations. "These factors can complicate delivery of a consistent message," Jeff explains. "My role starts internally with flight standards, to make sure that our workforce has the tools, training, and organizational support necessary to implement the FAA's Compliance Philosophy in a consistent manner. As the updated guidance is adopted in the FAA, the focus will broaden to include external outreach, making sure GA pilots have correct information on the Compliance Philosophy."

Jeff is more than ready for this part of the task as well: in addition to his FAA duties, he continues to fly in the GA community as a volunteer mission, instructor, and cadet orientation pilot for the Civil Air Patrol. "It's a great way to give back and stay connected to GA," he notes. "And it will give me opportunities to help with Compliance Philosophy change management in the community."

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