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Afghanistan experiences. Published lives in Las Vegas. He has just of Swanson Group Aviation and Steven is now the general manager as theater lead and chief pilot for 20 years. Growing up, he worked at an FBO where Cade learned to fly, washed planes, got in the mechanics’ way, idolized the old-timers and their stories, and deepened his love for all things general aviation. 

Steven Athanas
A former USAF helicopter pilot, Steven Athanas ended his seven-year Afghanistan service as theater lead and chief pilot for the Unmanned K-MAX Program. Steven is now the general manager of Swanson Group Aviation and lives in Las Vegas. He has just published Ramrod, a novel of his Afghanistan experiences.

Mark Bennett
Mark Bennett worked for McDonnell Douglas Helicopter/Boeing for a decade, then in 1999 cofounded an aerospace-only marketing agency. With nearly 30 years of photography and design experience serving the aerospace and defense industries, he founded AeroMark Images to shoot and write for both industry and media.

Cade Clark
HAI’s VP of government affairs, Cade Clark has directed association advocacy programs for nearly 20 years. Growing up, he worked at an FBO where Cade learned to fly, washed planes, got in the mechanics’ way, idolized the old-timers and their stories, and deepened his love for all things general aviation.

Zac Noble
Zac joined HAI as its deputy director of flight operations and technical services after 11 years of flying in the air medical sector. A US Army veteran, Zac’s aviation career spans more than 35 years. He is a dual-rated ATP, a dual-rated CFII, and an A&P with IA privileges.

Jen Boyer
Jen Boyer is a 20-year journalism and public relations professional in the aviation industry, having worked for flight schools, OEMs, and operators. She holds a rotorcraft commercial instrument license with CFI and CFII ratings. Jen now runs her own public relations and communications firm.

David Jack Kenny
David Jack Kenny is a fixed-wing ATP with commercial privileges for helicopter. He also holds degrees in statistics. From 2008 through 2017, he worked for AOPAs Air Safety Institute, where he authored eight editions of its Joseph T. Nall Report and nearly 500 articles. He’d rather be flying.

Terry Palmer
With more than 25 years of experience in aviation safety and training, Terry Palmer has represented clients in their dealings with the FAA and assists them in their compliance responsibilities. He also works with clients on transaction, aviation insurance, and litigation issues. 

Robert Lakind, Esq.
Robert Lakind is a former airline pilot who now works as an aviation attorney and is a member of HAI’s Safety Committee. Robert represents clients in their dealings with the FAA and assists them in their compliance responsibilities. He also works with clients on transaction, aviation insurance, and litigation issues.

Ric Peri
A US Coast Guard veteran, Ric Peri has more than 45 years in aviation maintenance as a mechanic, instructor, writer, consultant, and auditor. As the VP of government and industry affairs with the Aircraft Electronics Association, Ric advocates for the avionics and maintenance industries before aviation authorities worldwide.

Martin J. "Marty" Pociask
Martin J. "Marty" Pociask retired from Helicopter Foundation International (HFI) in 2018 after 17 years with the foundation and HAI. He most recently served as curator for HFI and was a former editor of Rotor magazine. Marty is a talented artist who also teaches art.
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How Problems Get Solved

IN 1914, WOODROW WILSON, the 28th president of the United States, said to the National Press Club, “I not only use all the brains I have, but all I can borrow.” In our industry, we should all take this sentiment to heart. Whether you need to borrow some brains or you are willing to share your experience and perspectives to help others, step forward and get involved.

At one point in my career, I was fortunate enough to be in on the ground floor of the introduction of night-vision goggles into US civil aviation. Some of the bright and dedicated individuals who worked to make this happen were Dutch Fridd of Rocky Mountain Helicopters, supported by Russ Spray, our CEO, and Karl Poulsen, VP of Aviation Services; Grant Pearsol, Lynn Higgins, and Lew Olson of the FAA’s Salt Lake City Flight Standards District Office; and Mike Atwood of Aviation Specialties Unlimited. My thanks to them and all the individuals who measurably advanced the level of safety in the helicopter air ambulance sector.

Progress in aviation can sometimes be slow. It takes years to get an aircraft certified or a rule changed. Some issues we have in our industry, like the shortage of pilots and mechanics, didn’t arrive in one day—and it will take more than one day to solve them. Still, when I see what people around the industry are achieving, I am encouraged about our future.

On September 7, 2018, I had the privilege of attending a safety symposium hosted by the Rotary Wing Society of India (RWSI). It was a great event, with representation from all branches of the Indian military and from virtually every civil operator, manufacturer, and industry stakeholder from neighboring countries.

The RWSI is an all-volunteer group headed by Air Vice Marshal K. Sridharan that was formed 20 years ago to promote the safe and efficient use of helicopters in India and surrounding areas. The scope of their work is amazing as they tackle every topic related to the improvement of Indian helicopter operations.

On September 29, HAI cohosted a regional safety conference with the Professional Helicopter Pilots Association (PHPA) in Van Nuys, California. The PHPA is another all-volunteer group of aviation professionals dedicated to the safe and efficient operation of helicopters, this time in Southern California. I have had the pleasure of working with Morrie Zager, PHPA president, and some PHPA members on the issue of helicopter noise in the Los Angeles Basin. The L.A. Area Helicopter Operators Association (LAAHOA), headed by Chuck Street, is another volunteer industry group that is active in Southern California.

PHPA and LAAHOA have been instrumental in finding solutions for noise-sensitive areas around the L.A. Basin, working with representatives from the FAA’s Western-Pacific Regional Office, Robinson Helicopter, local homeowners, and individual pilots. Without their efforts, helicopter operations in the region could become very limited or go away altogether.

Time and again in my career, I’ve seen how individuals can work together for the benefit of all. It’s a reminder that our united efforts can make a difference.

I would encourage all in our industry, regardless of your position, to become involved with groups like these. To paraphrase Wilson: get out there and borrow those brains.

There is so much talent out there, and as aviation professionals, we all have a license to learn. So many are willing to share their knowledge and abilities to improve our industry. Join them!

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Hope You Like Our New Look

The mission of HAI is to help you keep the rotors turning. My fellow staff members and I come to work each day to make that happen. One way we do this is to produce a robust HAI communications program that informs, entertains, connects, and promotes the international civil helicopter community. This is why we produce ROTOR, ROTOR Daily, and the HAI website—and why we have instituted major changes in each.

As you read this issue of ROTOR, you may have noticed its new design. But the changes are more than skin deep. In addition to choosing new paper, fonts, and logo, we have made a concerted effort to bring you more stories “from the field,” where the skids break ground contact and the rotors are turning.

At the same time, we have updated our website, rotor.org, with advanced technology and a fresh new look. We want to provide you, our member or customer, with the most current, relevant information that will assist you in your day-to-day activities. We also wanted to create a website that you could navigate easily and find what you’re looking for. If you haven’t done so in a while, visit rotor.org. I think you’ll be pleased.

Another of our publications is our daily e-newsletter, ROTOR Daily. This round-up of all of the day’s news for the international helicopter community is valuable reading for those in the vertical-lift business. You’ll also learn what HAI is doing to support our members and the industry. If you haven’t already, I strongly recommend that you subscribe, for free, to ROTOR Daily so you stay abreast of news that can affect you. Visit rotor.org/subscribe to sign up.

Underpinning these recent changes is HAI’s new association management system. This complex software allows us to run many different processes, but it works best when the end user or customer (that’s you) never gives it a thought. While the upgrades to our database and related systems are important to us, it is mission critical that they provide you with the tools to easily manage your HAI membership, update your subscriptions, obtain safety information, register for HAI HELI-EXPO, or conduct any other business with HAI. This system also provides members with the opportunity to update their membership record to include every employee, so they too can access HAI publications, resources, and other benefits.

Now that we’ve upgraded the technology that connects us to you, we want to stay in touch. We want to hear from you, our members and customers. This interaction should be a two-way street, and I’d like HAI to do more listening. You don’t exist for us; we exist for you, to enhance your ability to operate safely, efficiently, and as part of an economically sustainable industry.

Our effectiveness when we advocate on your behalf is enhanced when you share what’s happening in your operating environment. When you call about an issue with crash-resistant fuel tanks or want to recognize an extraordinary colleague with a Salute to Excellence nomination, we learn about conditions in the field. And if it’s important to you, then it’s important to us.

I hope you find the changes we have made beneficial and relevant to your operations. I would sincerely appreciate it if you would let me know what you think of them—either way, positive or negative. Are we moving in the right direction to better serve your needs? Do you have any suggestions that would add further value for you?

Send me your thoughts about our new look or anything else that’s on your mind. Let me know at tailrotor@aol.com. As always, fly safe, fly neighborly—and keep those rotors turning!

Best Regards,

Matt Zuccaro is president and CEO of HAI. He holds ATP and CFII ratings for helicopters and airplanes. His 50-year career in aviation began as a US Army helicopter pilot in Vietnam. Matt’s priority is safety in both his executive and operational assignments. His wife, Doreen, has been his copilot for the past 50 years.
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Your Mission, Our Mission: KEEP THE ROTORS TURNING
FAA Reauthorization Bill: What’s In and What’s Out

Reauthorized for the next five years, the FAA can tackle new programs and priorities.

Well, It’s Done. Congress finally passed the FAA reauthorization bill (H.R.302) and only needed one little extension of a few days to wrap it up. A five-year reauthorization hasn’t happened in 36 years—since 1982. We are on a roll!

Let’s talk about what is in, and just as importantly, what is not in the bill. But first, what exactly is a reauthorization bill, is it different than funding, and why am I making such a big deal about it?

Quite simply, congressional authorization authority is what gives a federal agency the legal authority to exist and operate. The FAA is now authorized to exist and operate for the next five years.

The reauthorization bill does not, however, give it the money to operate. In a separate funding process, Congress will provide the necessary (or what Congress deems to be appropriate) finances for the FAA to perform its authorized duties. Congress is currently working on the funding levels for the FAA; those decisions were punt ed until after the November elections.

So why is reauthorization a big deal? It’s not like Congress would cancel the FAA. But as we have seen in the past, the FAA hasn’t always had access to a stable operating and funding environment. The last time the agency came up for reauthorization, there were 23 short-term extensions before a four-year authorization bill was passed in 2012. Many believe that the agency was ill served by the short-term operating environment, leading to a lack of progress on several long-term initiatives.

In addition to providing the legal authority for an agency to operate, Congress uses reauthorization bills to set new priorities and initiatives for an agency. Whatever your view is on Congress, I’m sure you can appreciate that there are complex issues raised when you invite 535 legislators to participate in setting aviation policy for our country. All types of new ideas come flooding into the process; some good, some bad. Add in the legislative process, with all its nuances and strange bedfellows, and sometimes you can open a real can of worms. Reauthorization can be a gamble!

Speaking of bad gambles, let’s mention what is NOT in the bill: privatization of the US air traffic control (ATC) system. This tremendous victory is a testament to all HAI members who worked hand in hand with the rest of the general aviation (GA) to oppose this provision. HAI advocated for the industry on Capitol Hill, and our members flooded their elected officials’ in-boxes with their advice on this issue.

It was a hard-fought battle, but we won, and we couldn’t have done it without you, our members. Thank you for your involvement! However, don’t think that proponents of ATC privatization won’t try again. (Are you already dreading the columns that I will be writing five years from now, as we discuss the next reauthorization bill?) My advice is to always watch the can of worms.

This wonderful little FAA bill is 1,200 pages long. You’ll get through a lot of Diet Pepsi and brownies before you get to the last page. Trust me. However, because I did that, you don’t have to. HAI has compiled a summary of provisions important to GA and the helicopter industry. You can find both a copy of the bill and our 14-page summary of it on the advocacy page of our website: rotor.org/initiatives/advocacy. For those of you who want the Reader’s Digest version, read on.

The FAA reauthorization bill contains a number of good, even great, provisions that provide long-term stability to the FAA and advance important priorities for GA. Like many in our industry, HAI has expressed concern over the aviation workforce shortage. We recently conducted a study with the University of North Dakota that conclusively demonstrates that the helicopter industry faces a severe pilot and mechanic shortage. The FAA
reauthorization bill provides important solutions to tackle this critical industry issue. Additionally, the bill addresses needed reform to FAA regulations pertaining to training programs at aviation maintenance technician schools.

H.R. 302 also provides needed clarity on the safe integration of unmanned aircraft systems (UAS) into the national airspace, allowing that sector to move forward with exciting commercial opportunities. HAI views safety as priority No. 1, and we have long advocated for the safe integration of UAS. Our perspective is unique, as our members are the ones operating in the same airspace as UAS for most of our flight profiles—and in some cases, our members are also the ones who are flying the UAS. The FAA’s ability to fully regulate all aircraft, including UAS, in the National Airspace System is paramount for safety, and H.R. 302 confirms that authority to the FAA, including standards for remotely identifying UAS.

The bill also addresses an important helicopter safety issue with crash-resistant fuel systems by adopting the recommendations of the Rotorcraft Occupant Protection Working Group. HAI worked closely with Congress to ensure that the recommendations of the Working Group were fully captured and incorporated in the legislative text.

H.R. 302 contains a host of regulatory opportunities for the industry. The bill directs the FAA to conduct numerous studies and collaborative outreach for new initiatives. The FAA has literally been directed by Congress to reach out to aviation stakeholders—us—for input. HAI will be deeply involved in this process, but don’t forgo the opportunity that may exist for your company by participating in such research and outreach.

The FAA reauthorization bill was a lot of work for everyone. I realize that reading, or even just skimming, 1,200 pages of legislative prose may not be your definition of fun. But this can of worms brings new ideas, initiatives, solutions, and opportunities to the industry. Making sure those opportunities exist is exactly why you have a trade association representing your interests.

Thank you again for your involvement in our advocacy efforts to ensure this reauthorization bill advances the helicopter industry. Congress incorporated your voice and positions in H.R. 302. Keep up the active participation, as the industry and the FAA move to tackle our next challenges.

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- Aviation Safety Programs and Emergency Preparedness
- Integrating UAS into Your Current Operation
HAI BRIEFS

HeliFutures: Industry Partners Gather to Address Helicopter Pilot and Mechanic Shortage

Thirty representatives of companies and organizations in the helicopter industry met recently to discuss the workforce shortage of pilots and aviation maintenance technicians (AMTs) within the helicopter industry. The event, HeliFutures: Creating Strategic Workforce Solutions and Driving Industry Business Outcomes, was held at HAI’s Alexandria, Virginia, offices.

This meeting follows the release of a study earlier in 2018 that quantified the depth of the shortages for the first time. Commissioned by Helicopter Foundation International (HFI) and conducted by the University of North Dakota, the study confirmed the long-held “word on the street” that our industry was experiencing a shortage of pilots and AMTs.

“Based on the University of North Dakota Study, we knew the demand for helicopter pilots and maintenance technicians has outpaced supply and will continue to get worse over the next 20 years,” says Allison McKay, vice president of HFI. “We created HeliFutures to bring the industry together to address the reasons for the shortages and ensure that we have a high-quality, sustainable workforce.”

“These shortages are now stopping our HAI operator members from meeting obligations or accepting new work,” said Matt Zuccaro, HAI president, during opening remarks before the group. “I am pleased that so many could join us to find solutions to one of the most important issues facing our industry today.

“For us to succeed, we must overcome significant obstacles,” continued Zuccaro. “Competition for highly skilled personnel is fierce across aviation, and we see that even nonaviation industries want people with the skills that our pilots and AMTs have.”

Working in smaller teams, the group first identified the industry’s top three workforce challenges:

- The lack of available pilots and aviation maintenance technicians
- Retaining qualified personnel
- Affordability and accessibility of education and training

The group identified strategies to support and drive industry workforce outcomes.
From our day-and-a-half event, we identified three solutions the industry can develop to retain and attract future helicopter professionals, " continues McKay. "Obviously, there are many ways to tackle this problem, but we decided to focus on these three."

The three strategies identified are:

- **Promote our industry to the next generation.** Steps in accomplishing this solution include creating an online portal for both AMTs and pilots that provide a one-stop, comprehensive look at the career, including salary projections, sample career paths, training information, and testimonials from those in the industry.

- **Create apprenticeship programs.** Apprenticeship programs could be the key to closing the experience gap by providing low-time pilots and AMTs with a way to gain the skills and hours they need to progress in their chosen careers.

- **Improve overall employee benefits to increase retention.** This strategy will need to be implemented at the company level. Meeting attendees noted that the airline industry is much more vertically integrated than ours—there are fewer companies and they tend to be larger. This gives airlines competitive advantages when competing with the helicopter industry for pilots and AMTs, such as higher pay and extensive recruitment campaigns. However, numerous studies have shown that many factors other than salary are important in job satisfaction. It's time to be creative in thinking how your company could attract and retain your workforce.

**HAI BRIEFS**

**HAI 2.0**

**SUMMER WAS A BUSY TIME AT HAI, as the association conducted a wide-ranging software overhaul that touched every department and every member.**

Most noticeable to HAI members and visitors is the new website (www.rotor.org), built with the assistance of web developer and new HAI associate member, 10 Pound Gorilla. The new site is

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**ONE QUESTION**

**FOUR ANSWERS**

What is the greatest threat to the helicopter industry?

1. **Rick Kenin**
   - Chief Operating Officer—Transport
   - Boston MedFlight

2. **Kerry Berg**
   - Director of Operations
   - Sanford Health Rotor Wing

3. **Gordy Cox**
   - Director of Operations
   - Redding Air Service

4. **Kurt Robinson**
   - President
   - Robinson Helicopters

Competition for qualified helicopter aviation professionals, combined with a decreasing pool of new entries into the professions, is driving up personnel costs. The experience shortage will impact safety when “old hands” are no longer available to instruct and train students. This trend will eventually make rotary-wing services economically unsustainable when compared to autonomous vehicles and alternate transportation services.

The number of qualified applicants for both pilot and mechanic positions has dwindled in recent years. With fewer applicants coming from the military, we are relying more on civilian-trained candidates. Unfortunately, the number of civilian training facilities has also decreased. And the road to meaningful employment for these candidates can often be lengthy and expensive. Civilian entrants will require a more structured path to gain the appropriate experience needed.

My biggest concern for the future of the helicopter industry is staffing. It is getting increasingly difficult to hold onto pilots with the right skill set. It used to be that there were plenty of pilots with the requirements needed to fly utility. However, in recent years those requirements have become more stringent, and we find ourselves having to train pilots to meet the higher standards.

What keeps us up at night is the lack of qualified mechanics entering aviation or coming out of A&P schools—in particular, mechanics with an electrical/avionics background. As the demand for glass cockpits, autopilots, and other electrical/mechanical systems has flourished, the need for mechanics competent in these areas is growing tremendously.

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“From our day-and-a-half event, we identified three solutions the industry can develop to retain and attract future helicopter professionals,” continues McKay. “Obviously, there are many ways to tackle this problem, but we decided to focus on these three.”

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supported by an updated architecture that enables a host of new features. The site also boasts a much more modern look, with an emphasis on making it easy for visitors to find what they’re seeking.

The backbone of the project is HAI’s new association management software (AMS) that integrates significantly with the website. A big part of any AMS is a database, and HAI’s new AMS, provided by Impexium, allows users to more easily access membership information. With the new system, HAI members and customers can update their information online, renew their membership, and even manage their ROTOR subscriptions.

HAI members can now use their email address and set their own password when accessing the site. “One of the nicest elements of these integrations is the use of single sign-on technology,” says Ed DiCampli, chief operating officer of HAI and the driving force behind the software updates. “A member or visitor has access to most of our new features, and they only need to register and sign on once.”

HAI’s Education Department got in on the action as it opened the new HAI Online Academy. Through the academy, helicopter professionals can register and take online courses in a variety of subjects—anytime, anywhere around the world. The HAI Online Academy offers the courses below, and the list is growing:

- Safety Manager
- Maintenance Manager
- UAS Part 107 Test Prep
- Garmin 430/530 Master Training
- Strike, Snarge, and Safety—Your Guide to Wildlife Strike Reporting

One of the methods HAI uses to communicate with members also got a facelift. HAI’s Business Development unit switched to a new email service provider that distributes ROTOR Daily and other email announcements. This service also integrates with the AMS, providing for better opt-in/opt-out options while continuing to maintain the security of users’ email addresses and other personal information.

In fact, integration of all the systems of the association—from membership to education to communication—has made HAI a much better place to operate.
ROTOR

renewal, to event registration, to picking out your booth space, and more—was one of the aspects that made the project both challenging and rewarding. But the goal was to ensure that all system users, including HAI staff, members, and customers, could conduct their business with HAI efficiently and effectively.

HAI BRIEFS

Chris Hill Named HAI Director of Safety

HAI is pleased to announce the hiring of Chris Hill as director of safety. In this position, Chris is responsible for managing the association’s existing aviation safety programs and for developing new safety initiatives to benefit HAI’s membership and the international helicopter community.

“We are grateful to find someone of Chris’s caliber to fill our director of safety position,” says HAI president and CEO Matthew Zuccaro. “I’m looking forward to working with Chris to confront the safety issues affecting our industry.”

Chris comes to HAI with more than 32 years of rotary-wing and operational aviation safety experience. After serving as a helicopter pilot in the US Army and Coast Guard, Chris served in numerous roles supporting Coast Guard aviation safety, operations, logistics, and acquisitions. He also has extensive commercial offshore experience operating from multiple platform and vessel types in the Gulf of Mexico.

For the past five years, Chris served at Coast Guard Headquarters in Washington, D.C., as the service’s civilian aviation safety manager. He served as a safety officer, flight standardization officer, and instructor pilot in three operational assignments. He has an ATP helicopter rating with more than 5,000 flight hours in 12 commercial and military rotary- and fixed-wing aircraft.

“I am honored to be a part of the HAI team, working with our members, operators, and safety professionals around the world,” says Chris. “As the director of safety, my primary focus will be to help enhance and integrate safety cultures and leading practices that can benefit all industry stakeholders.

“I will be serving as the staff liaison for the Safety and Unmanned Aircraft Systems Committees,” Chris continues. “As we work together to continue improving our safety programs and services, I really look forward to getting creative ideas and constructive feedback from our industry committees, members, and others to ensure that we continue to address the highest priority safety issues and concerns.”

A native of California and Texas, he graduated from Embry-Riddle Aeronautical University with a bachelor’s in professional aeronautics in 1989 and a master’s in aeronautical science in 1998.

Chris is married and has a son and two daughters. His wife, Allison, is a manager at VectorCSP, based in Elizabeth City, North Carolina; Colten is an account manager at Metropolitan Press in Dallas; Naomi attends Chapman University in Orange, California; and Sophia attends Springfield High School in Springfield, Virginia.

HAI BRIEFS

HFI Expands Scholarship Program

HELICOPTER FOUNDATION INTERNATIONAL (HFI) has expanded the number of scholarships offered as part of its 2019 Scholarship Program for student pilots and aviation maintenance technicians (AMTs). New this year are three scholarships to Southern Utah University’s (SUU) Rotor Wing Pilot Program. Each scholarship, valued at up to $20,000, covers specific training labs, tuition, and fees.

Located in Cedar City, Utah, the Rotor Wing Program is part of the school’s aviation degree program. The SUU scholarships include training for:

- Rotor Wing Cross Country Maneuvers Lab
- Rotor Wing Commercial Pilot Certification Lab
- Instrument Commercial Rotor Wing Lab A
- Instrument Commercial Rotor Wing Lab B
- Rotor Wing Instrument Certification Lab.

Including the new scholarships, the HFI program now comprises 22 scholarships for pilots and AMTs currently enrolled in training. The deadline to submit a scholarship application is November 30, 2018. Interested students should visit rotor.org/scholarships for additional information and application requirements.

HAI BRIEFS

Happy 70th Anniversary!

ON DECEMBER 13, 1948, JUST UNDER three years after the first helicopter was certificated for civilian use in the United States, 15 men and one woman gathered in Burbank, California, at the offices of AF Helicopters. This group of risk-taking entrepreneurs who had invested in the potential of a brand-new aviation technology formed the Helicopter Council—a group that is today known as Helicopter Association International (HAI).

The purpose of the Helicopter Council, in part, was “promoting the interests of helicopter operators, for mutual cooperation and aid.” Since that momentous
meeting, our organization has gone through a series of name changes. However, HAI’s current mission still remains fixed on our members: “To provide its members with services that directly benefit their operations, and to advance the international helicopter community by providing programs that enhance safety, encourage professionalism and economic viability while promoting the unique contributions vertical flight offers society.”

Today, HAI continues to promote the helicopter industry and safe flight, supported by a nine-member Board of Directors elected from member companies. Also assisting the association are 13 committees made up of volunteers who come together to address current problems and issues affecting our industry. HAI HELI-EXPO® remains the largest helicopter trade show and exposition in the world, attended by thousands of exhibitors and attendees every year.

Starting with a single person in the 1960s, HAI’s staff today includes more than 40 people dedicated to assisting our members in promoting the safety, efficiency, and profitability of helicopter operations around the world. HAI President and CEO Matt Zuccaro, a 50-year veteran pilot and aviation executive, and a former chairman of the association, has led HAI since 2005.

Preparing for Winter Operations

1. **Review guidance for cold-weather operations.** Most OEMs, both airframe and engine, have published guidance relating to the conduct of operations when conditions are near, at, or below freezing temperatures. The FAA has also published various guidance in the form of SAFOs, SAIBs, and other communications. Schedule some time to review these and ensure you are operating in compliance.

2. **Check for moisture.** A key issue affecting safety of flight is the accumulation of moisture in fuel systems, engine control systems, and almost any type of sensing system. Temperature changes can affect the amount or location of water accumulation. Does your aircraft require the use of a fuel additive such as Prist or something similar? If so, under what conditions?

3. **Conduct a safety stand-down.** Hold a safety stand-down to review your company’s SOPs, as well as industry best practices. Include both maintenance and operations personnel. Everyone needs to be on the safety team!

4. **Learn from your mistakes.** If you have any past company history relating to cold-weather operations, talk about what happened, why did it happen, and how we will avoid it happening again. We aren’t inventing new ways to have accidents, so let’s learn from our old ones.

5. **Help the new guys.** If you have new pilots or maintenance technicians on staff, be mindful that they may not have experience operating in your environment. Make sure they get the extra training or oversight they need. An operation where 98 percent of your colleagues know the right way to do things is not acceptable.

The cold temperatures that winter brings can be more than a nuisance for helicopter operations.
Flying Cars: How We’ll Do It

Tom Prevot of Uber Elevate talks about his company’s ambitious plans to reconfigure urban air traffic.

UBER ELEVATE is developing a vertical-lift low-altitude passenger shuttle system that it hopes will do in the air what its popular shared-ride service, Uber, has done on the ground in cities around the world. It’s aiming for a 2023 launch in two U.S. metro areas (Los Angeles and Dallas–Fort Worth) and one yet-to-be-named international city. But a lot has to happen first. So ROTOR asked Dr. Tom Prevot, director of engineering/airspace systems for Uber Elevate, about the, um “road” ahead.

What are biggest challenges that must be overcome for Elevate to hit its target launch date of 2023?

Prevot: We are creating an all-electric transportation system, so rapid advancement of battery technology—which is making great strides already—is critical.

Another is airspace integration. What will it take to make sure these aircraft can operate safely in the low-altitude airspace over cities that over time will become full of such vehicles?

And the third is public acceptance, which will very much be tied to the noise issue and also to people accepting these airplanes flying relatively low over people’s heads, even if they do so very quietly.

What about the partners you’ll need to finance, build, and operate this system?

We believe this is kind of the next “Big Thing,” if you’ll allow me to use that term: a new mode of transportation that presents different options to the congestion on the streets in big cities. There’s lots of growth and profit potential for our partners operating these aircraft or building and operating the infrastructure. We’ve already got five well-respected partners who want very much to be a part of this future: Bell, Embraer, Pipistrel, Aurora, and Karem.

How do you plan to guarantee the safety of the system?

We envision there eventually being many thousands of eVTOL [electric vertical take-off and landing] aircraft in the system. The existing traffic management system can’t handle that for a lot of technical reasons. And a single controller today can safely handle only about 18 aircraft at once.

You can’t just keep on adding more controllers because the existing system is not designed to grow that way. So we are looking at new ways of managing this low-altitude urban air traffic that would be much more reliable than the existing technology that was created in the ‘50s and ‘60s.

How much will you charge for a ride?

When we start operating, we think we can operate at sort of a comparable price to our BLACK (luxury car) service. Very quickly thereafter, we think we can get the price down to something comparable to Uber X. We also believe the batteries are something that over time the price point will come down on.

Eventually we think we’ll be able to offer an economy (Elevate) service, certainly below what the price of a helicopter ride is today, and comparable to the cost of owning and operating a car. We are talking about eventually getting the cost of this transportation down to less than a dollar per mile.
HELIÇOPTER EVENTS

2018

NOVEMBER 13–14
HAI Firefighting Safety Conference
Helicopter Association International
Boise, Idaho, USA
rotor.org/firefightingconf

NOVEMBER 20–21
6th EASA AD Workshop
European Aviation Safety Agency
Köln, Germany
easa.europa.eu/newsroom-and-events/events/6th-easa-ad-workshop

DECEMBER 4–7
2018 Ag Aviation Expo
National Agricultural Aviation Association
Reno, Nevada, USA
agaviation.org/convention

DECEMBER 12–13
Second ICAO NGAP Global Summit (NGAP/2)
International Civil Aviation Organization
Shenzhen, China
icao.int/Meetings/ngap2018

2019

JANUARY 28–FEBRUARY 1
8th Biennial Autonomous VTOL Technical Meeting & 6th Annual Electric VTOL Symposium
Vertical Flight Society Arizona Chapter
Mesa, Arizona, USA
vtol.org/events/autonomous-vtol-technical-meeting-and-evtol-symposium-2019

MARCH 4–7 EXHIBITS OPEN MARCH 5–7
HAI HELI-EXPO 2019
Helicopter Association International
Atlanta, Georgia, USA
heliexpo.rotor.org

MARCH 17–20
Aviation Technician Education Council (ATEC) Annual Conference
Wichita, Kansas, USA
atec-amt.org/annual-conference.html

APRIL 16–18
ABACE—Shanghai
NBAA and AsBAA
Shanghai, China
abace.aero/2019

APRIL 29—MAY 2
AUVSI Xponential
Association for Unmanned Vehicle Systems International
Chicago, Illinois, USA
xponential.org/xponential2019

MAY 8–9
Helicopter Air Medical Safety Conference
Cosponsored by HAI, AAMS, and AMOA
Arlington, Virginia, USA
rotor.org/amsc

MAY 13–16
Forum 75 (75th Annual Forum and Technology Display)
Vertical Flight Society
Philadelphia, Pennsylvania, USA
vtol.org/forum

JUNE 6
NBAA Regional Forum
National Business Aviation Association
White Plains, New York, USA
nbaa.org/events/2019-white-plains-regional-forum

JULY 15–20
APSCON 2019
Airborne Public Safety Association
Omaha, Nebraska, USA
publicsafetyaviation.org/events/apscon-2019-omaha-ne

OCTOBER 22–24
NBAA-BACE
National Business Aviation Association
Las Vegas, Nevada, USA
nbaa.org/events/bace/2019/

NOVEMBER 4–6
Air Medical Transport Conference (AMTC)
Association of Air Medical Services
Atlanta, Georgia, USA
aams.org/events/amtc

NOVEMBER 17–21
Dubai Airshow
Tarsus F&E LLC Middle East Dubai, United Arab Emirates
dubaiairshow.aero
ARIZONA DEPARTMENT OF PUBLIC SAFETY | BELL 429
SEDONA, ARIZONA | JUNE 26, 2018
CREW: OFF. DARREL DETTY (PILOT, RIGHT SEAT)
OFF. CRAIG BREMER (SYSTEMS OPERATOR, LEFT SEAT)
OFF. EDGAR BISSONNETTE (RESCUE SPECIALIST, IN CABIN)
PHOTO BY MARK BENNETT
Pilot Pathway Programs Gain Traction
As recently as 2011, Mark Schlaefli received a stack of nearly 400 pilot resumes at the beginning of every tour season at Papillon Helicopters in Las Vegas. He’d heard about a looming pilot shortage, but it didn’t seem to be an issue. He had plenty of talent to choose from and new pilots calling all the time.

At about the same time, flight schools from around the region began reaching out to companies like Papillon to discuss partnerships that would create pathways to professional pilot careers. Flight schools would benefit by promoting a career path for its pilots while operators would enjoy a steady source of pilots trained to standards vetted by the operators.

“We really didn’t see a need to have such a partnership, with so many pilots sending us resumes, so we didn’t pursue the opportunity,” says Schlaefli, who is now director of operations at Las Vegas–based Sundance Helicopters. “I’ve come to regret that decision. We should have been partnering with schools all along, participating in the development of pilots from an early stage to help ensure qualified pilots.”

Today, not only is the stack on Schlaefli’s desk much shorter, the skill and experience of candidates applying for the jobs is lower than previous years.

“Our industry has an arbitrary 1,000-hour minimum turbine time requirement for new hires, but each year the number of pilots with that experience shrinks,” says Schlaefli. “There is no regulation requiring it. It’s operator imposed.

“We need to think outside the box to keep our pipelines open, such as partnerships and programs to ensure skill and safety in lower time pilots,” he says. “Time in a logbook does not necessarily equal experience or the capacity to be a professional helicopter pilot.”

Schlaefli is not alone. Historically, US Customs and Border Protection’s (CBP) Air and Marine Operations (AMO) hired the majority of its aviation agents directly from the military, with pilots from regional airlines being a close second. However, competition with airlines for these pilots paired with increased bonuses to remain in military service have significantly reduced the talent pool. At the same time, AMO is expanding, both increasing current pilot ranks and expanding into the unmanned aircraft sector.

Fifteen years ago, CBP required all new-hire helicopter pilots to spend time as a ground agent before transitioning to aircraft in order to gain a strong understanding of the operation. There was plenty of interest and no threat of a shortage of talent.

Today, with all air operations for the CBP now under AMO, the requirement to serve as a ground agent no longer exists. Yet competition is fierce for qualified applicants who meet the agency’s 1,500-hour minimum.

**Responding to a Shortage**

At HAI HELI-EXPO 2018, the University of North Dakota (UND) presented the findings of its pilot and mechanic labor study, the UND-HAI Rotorcraft Pilot and Mechanic Supply Forecast. Conducted in partnership with Helicopter Foundation International (HFI) and Helicopter Association International (HAI), the study projected a shortage of more than 7,600 helicopter pilots and 40,600 mechanics during the next 18 years.
The largest threat to the helicopter industry by far are the commercial airlines. Desperate to fill their critical pilot shortage, regional airlines are targeting helicopter pilots by offering them tens of thousands of dollars in ATP transition training, promises of pipelines to major airlines, and steady, well-paid work. Hundreds of helicopter pilots have taken the offer. In 2017, more than 500 helicopter pilots made the transition to airline work.

In response to the UND study, HAI President Matt Zuccaro urged the industry to think collaboratively to develop and maintain pilot pipelines: “We as an industry must start addressing this issue and finding creative ways to attract and keep our workforce in the helicopter industry.” Zuccaro suggested that solutions lay in partnerships, new recruiting programs, and changing industry-imposed requirements.

Operators like Sundance and agencies like the CBP’s AMO have already begun. “This year at the HTOC [Helicopter Tour Operators Committee] meeting, I started the conversation about reviewing the 1,000-hour minimums to hire pilots and developing robust initial operating experience (IOE) programs for lower time pilots,” Schlaeeli says.

“I believe if we partner with select schools and hire their graduates, tour operators can safely hire pilots at 750 hours,” he says. “These pilots would then enter an IOE program where they could fly with current pilots for a period of time to learn the job, aircraft, environment, and company procedures. The idea was well received and, with work, I think we can get the industry there.”

The AMO Pathways Program

The AMO is taking a similar tack. In 2010, the federal government began a Pathways Program to help fill many federal positions throughout the civil service. However, AMO did not initially see a need to utilize the program. Based on the changing aviation industry, the AMO Pathways Program was created in 2017, thanks in part to the support of North Dakota Sen. John Hoeven.

Funded from the salaries of unfilled AMO positions, the program works directly with UND, recruiting aviation program sophomores and juniors interested in careers with the AMO. Successful candidates are offered paid internships to work a minimum of 640 hours at the agency’s National Air Security Operations Center – Grand Forks (NASOC-GF) in Grand Forks, North Dakota. Serving as operations center staff, they begin learning about the agency and supporting air operations, with a defined path to eventual pilot careers with the AMO, flying helicopters, airplanes, and unmanned aircraft systems (UAS).

David Fulcher, acting director of air operations at NASOC-GF, says that his agency’s public service mission was a motivating factor in creating their pathway program. “We need to ensure we can continue to provide service to the public despite issues around pilot hiring.

“We knew we needed to grow our own pilots, and the changing dynamics of the pilot industry drew us to look at other pools,” he says. “We have a long history of working with UND in research and education. It is one of the most successful student aviation training schools in the country, and we know their students are well trained. We are fortunate to have such a resource right here in Grand Forks.”

Between 850 and 900 students attend UND’s aviation programs, flying more than 135,000 hours a year. About 50 of those students are in the helicopter program, flying close to 5,000 hours annually in the school’s four Sikorsky 300Cs and two Robinson R44 Cadet helicopters.

UND Aerospace offers degree programs in several aviation and aerospace fields, including fixed-wing, helicopter, and UAS. The school operates more than 125 manned aircraft equipped with the latest avionics, including glass cockpit and flight-data monitoring, and a large selection of UAS.

“Our programs are designed to fully prepare students for professional aviation careers by exposing them to the environments they’ll encounter in those careers,” says Ken Polovitz, assistant dean of student services at UND’s School of Aerospace Sciences. “We have partnered with countless airlines over the years, helping develop and grow programs, training, and pipelines. We are excited to expand that collaboration with the CBP.”

The first group of 15 students entered the AMO Pathways Program in December 2017. Most are veterans, drawn to
For example, Adam (his last name withheld due to safety concerns) served in the Marines. He transferred to UND in 2017 and signed up for the AMO Pathways Program when it was announced, with dreams of becoming an AMO helicopter pilot.

“AMO’s mission mirrors the reasons I joined the military in the first place,” Adam says. “Not only do I get to be a pilot, but I can have a rewarding career serving a greater purpose as a pilot. I hope to be stationed on the southern border flying the UH-60 or AS350 in the next few years, and that’s pretty realistic now with this program.”

The interns will work for AMO around their coursework, and most plan to build flight time as flight instructors while in school. Upon graduation and completion of their 640-hour AMO work commitment, the interns will be promoted to aviation enforcement agents.

After initial training at the Federal Law Enforcement Training Center, the new aviation enforcement agents will support air operations, conduct aircrew duties, and participate in law enforcement activities, including collecting and processing evidence, interviewing suspects and witnesses, and preparing briefing reports. They will also have opportunities to build flight time alongside air interdiction agents (AMO pilots) and further prepare for their full-time pilot careers.
The program includes waivers toward meeting the agency’s requirement of 1,500 hours of flight time for promotion to air interdiction agent. AMO Pathways Program participants can receive a 25 percent waiver on that flight time. Some will receive up to 20 percent more in waivers based on their flight instructor experience.

Upon reaching their required minimum hours in aircraft category and class (typically about 1,000 with the waivers), the AMO Pathways Program participants will be eligible for promotion to air interdiction agents, where they can serve as career AMO pilots.

**The Skypath Program**

As the AMO Pathways Program launched, Schlaefli developed and put into action a plan for a pathway program for his company. Sundance partnered with flight school Leading Edge Aviation in Bend, Oregon, and began working with UND to put the finishing touches on Sundance’s new Skypath career program. Designed as a path from school to tour pilot and then on to helicopter emergency medical services (HEMS) or utility pilot, Skypath is currently available to students from both Leading Edge Aviation and UND.

Through the program, Sundance will identify and cultivate their future pilots. Moreover, Sundance leadership can provide insight and feedback to the school on the skills and knowledge they desire in pilots, ultimately helping to tailor aspects of training that will help the pilots prepare for and succeed at Sundance.

“We carefully vetted these two schools and chose them based on their strong training programs and willingness to partner with us to help develop the pilots we need in the tour industry and beyond,” Schlaefli says. “The initial selections were made based on a proven track record. Pilot candidates from both schools have proven to be the type of professionals that we want to hire.

“Leading Edge and UND are doing it right,” he says. “As the program becomes established, we will be looking to expand it to more schools.”

Sundance leadership will visit the schools quarterly and get to know the students. They’ll sit in when students interview to be flight instructors at the schools and identify the best candidates for the Skypath program. Those chosen are guaranteed an interview with Sundance once they’ve achieved 1,000 hours (and perhaps a lower number in the future as the industry evolves). If selected as Sundance pilots, they’re hired directly as full-time employees rather than the seasonal

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**2019 HAI HELI-EXPO**

BY HELICOPTER ASSOCIATION INTERNATIONAL
positions Sundance has provided in the past.

“The plan is to not only cultivate strong pilot candidates for Sundance but to also keep our pilots a little longer,” Schlaefli says. “To do that, when our pilots reach 2,500 to 3,000 hours, we will help them move into HEMS jobs at Air Methods, Sundance’s parent company, or into utility through a partnership we’ve developed with Redding Air Service in Northern California.”

Thinking Outside the Box
The Skypath program is in its infancy. Schlaefli has only started talking to potential candidates, but he already has high hopes that it can grow and expand, not only to more schools but also to offer more options for pilots looking to move beyond flying tours.

“We as operators should have been doing something like this all along, but the good news is we’re doing it now,” he says. “For our industry to continue to grow and thrive, we need to think more creatively and invest in our future workforce.”

Will pathway programs such as those run by Sundance Helicopters and the US Customs and Border Patrol enable the helicopter industry to compete with airlines in the fierce competition for new pilots?

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In its first two years of deployment in Afghanistan, K-MAX aircraft delivered 4.5 million pounds of supplies, all while substantially lowering the risk posed to US warfighters conducting resupply missions.

Testing the Unmanned K-MAX’s Limits

Sometimes trust is all we have. But whom (or what) should we believe in?

By Steven Athanas
Bingo Fuel. It was a caution light none of us had seen previously, at least not while operating the CQ-24A Unmanned K-MAX aircraft. With the vehicle many miles from home base, the light was a real concern: it signified a minimum fuel state for the return flight, the words on the command tent’s big screen for all to see.

The Situation
I was directing a team of contractors testing the K-MAX’s ability to deliver cargo while operating autonomously, part of our workup before we began flying actual missions. We were in southwestern Afghanistan, watching the operator maneuver the aircraft over Forward Operating Base Payne miles to the south of us. Because the K-MAX was over the horizon, the operator was using the Beyond Line of Sight (BLOS) datalink.

Maneuvering manually under BLOS was nonstandard, but I had directed it as a contingency in case the Payne equipment, operated by two Marines we had previously trained, became inoperative. We already knew that the K-MAX could autonomously complete a flight, but I thought it useful to know if we could reposition manually if asked to do so by the landing zone controllers. After all, this was a war zone—stuff happens.

We soon discovered that manual control of a hovering, over-the-horizon aircraft was difficult work. The CQ-24A BLOS installation had the same limitation as any other: system lag. Once a control input was made from our command tent, it could take up to six seconds for the signal to bounce off an orbiting satellite, travel down to the aircraft, influence its vector, send the resulting change in attitude, speed, and position back up to the satellite, and then back down to the operator’s graphic user interface (GUI) screen. (This provided team members with the rare opportunity to complain about the speed of light.)

With this lag, it was quite easy to “chase” the aircraft. Our eventual technique was to make a one-second input on the hand controller, release, then wait until we saw the K-MAX’s icon stop on the GUI screen. Repeated as necessary, the process was as tedious as it was inefficient.

Further, the BLOS installation was so basic that there was no guarantee a one-second displacement on the hand controller would produce the same amount of aircraft movement each time. And without external cameras, the operator had to surmise his entire closed-loop feedback from the GUI screen.

More Than a Fancy Science Project
The Unmanned K-MAX had begun as a mere science project years before. The brainchild of Greg Lynch, a Lockheed Martin program manager and former Air Force helicopter pilot, he first fought his own superiors and then Department of Defense officials over the feasibility of an unmanned helicopter delivering supplies to remote locations in a combat theater.

Lynch believed the K-MAX was the perfect platform for this, an aircraft already proven by hundreds of thousands of manned flight hours. The K-MAX design was simple for a helicopter, which meant it was reliable to the extreme. It was also quiet. Its dual intermesher configuration didn’t require a tail rotor, making its aural signature among the lowest in the world.

The Unmanned K-MAX prototype, using off-the-shelf components, began winning the hearts and minds of executives and officials alike through a series of successful demonstrations, culminating in a final test in 2011. By this time, the United States had absorbed significant ground convoy casualties in its two war zones. The military saw the ground convoy as the primary method of satisfying the logistical needs of the warfighter—and our adversaries saw them as targets with high rewards and low risks.

With the military eager to “get supplies off the roads,” nearly overnight the fancy science project gathered sufficient momentum for the Marines to send it to Afghanistan, as is, with civilians as its maintainers and half of its operators.

Bingo Fuel
In the command tent, the GUI had been slaved to a large TV monitor, which allowed all to see the Bingo Fuel caution light now glowing in bright amber on the left side of the screen. Though it was late December, the temperature in the tent rose perceptually. As the team lead, I wanted calm. I asked the operator, “What does the manual say?”

The system engineer at the back of the tent interjected, firm in his opinion that the K-MAX should depart for home...
base immediately. I ignored him. I wanted to keep to procedure, seeing this as a good training opportunity. Our real missions had yet to begin, and it was unclear how the team would perform outside the benign and rigidly controlled flight-test environment. The fact that the engineer was not a pilot also mixed into my soup.

The CQ-24A's operator's manual had 10 pages of advisories, cautions, and emergencies. After a few seconds of looking, the operator found the entry. “It says that fuel remaining is insufficient to complete the mission without consuming fuel reserves. Abort the mission.”

Abort the mission. It sounds simple, but it wasn’t. First, the K-MAX had to ascend vertically to its preprogrammed departure altitude, in this case a previously coordinated 1,500 feet AGL (above ground level) to avoid other Payne traffic.

The operator could have allowed the aircraft to ascend autonomously, but in that mode the climb rate was anemic. It was standard procedure to use manual mode with its higher vertical-velocity limits, which is what the operator did. Because of the system lag, he overshot his 1,500-foot perch slightly, which was acceptable, but still the climb had taken nearly 90 seconds, all while the Bingo Fuel light appeared to grow brighter.

Once the K-MAX stabilized, the operator announced "Depart" while simultaneously mashing the appropriate hand-controller button with his thumb (in tune with the science-project nature of the program, the controller was a reconfigured Xbox device). We watched the aircraft’s GUI icon skip forward and gather airspeed onscreen, slowly leaving its wind line and pointing NNE for home.

The GUI had a winds aloft indicator and, as the aircraft climbed further into the Afghanistan sky, we could see a substantial headwind component developing for the return flight. Carrying a not insignificant 2,500-pound external payload, the CQ-24A’s maximum airspeed was 80 knots, which then meshed with the wind component to produce an anemic 59 knots of ground speed. This meant the return voyage would consume nearly an hour, a long time to be visually bombarded by the steady amber message: Bingo Fuel.

**Flying Blind**

The aircraft had barely settled into cruise flight when the BLOS connection icon went gray, indicating the datalink was down. Until the link was reestablished, we would receive no further information from the K-MAX nor could we give it commands. Loss of BLOS was a common occurrence as it was dependent on the randomness of the satellite constellation orbiting the earth. Some satellites were stronger and newer than others. Others were inoperative. It was a heavenly crap shoot.

Though we couldn’t see it, we were confident the K-MAX had settled into its autonomous return. We also knew that the Bingo Fuel situation would unlatch itself if the onboard brain determined the conditions had improved sufficiently.

While we waited for the datalink, we considered jettisoning the load, which would have allowed the aircraft to accelerate to its unloaded maximum speed of 100 knots TAS (true air speed). I decided against it. While the aircraft may dip into its fuel reserve, it was not in danger of flameout and the amount of adverse publicity generated by a jettisoned load could set the Unmanned K-MAX Program back before it had really begun.

I made this decision even though I was unsure precisely how much fuel the K-MAX had onboard. To save cost and time, its fuel state was estimated by algorithm. While that calculating process had been quite accurate in flight testing, the aircraft’s fuel state was just another sliver of uncertainty weighing down our thoughts.

Though we were presently blind, the tone in the tent was mostly calm. The system engineer sporadically voiced his opinions regarding our courses of action, the most prominent being that the aircraft should be directed to land under power at the preplanned recovery point outside our base perimeter.

I knew that putting the K-MAX down “outside the wire” meant a high probability it would be damaged or destroyed. The base was under surveillance by the Taliban, and from my experience on a previous contract, I knew they had a propensity for coming out of nowhere to wreak havoc on a grounded aircraft.

We waited patiently for our fresh datalink signal. Later, we’d learn to monitor the satellite constellation on a separate laptop, but this early in the deployment we had no way of knowing what was occurring high above our heads. The engineer went mute for a time.

**The Solution**

After a few minutes, the datalink restored itself. The K-MAX's icon began staggering anew across the screen. The amber words remained: Bingo Fuel.

"Put it down at the recovery point. It's not going to make it home," declared the engineer.

I had great respect for this man, who was nearly young enough (or
me old enough?) to be my son. I had come to value his opinion during flight testing, even staking decisions entirely upon it. But now he was in my realm.

I stepped from the back of the tent and pulled from my pocket the most versatile aviation invention known to mankind: the CPU-26A/P air navigation computer, better known as the E6B Whiz Wheel.

I spun the inner scale under the black pointer until I hit the aircraft’s current ground speed, then read the estimated flight time remaining opposite the distance to be flown. I then repositioned the black pointer to fuel flow in gallons per hour and matched the estimated flight time on the inner scale to gallons to be burned on the outer scale. The output was multiplied by 6.7 to account for the density of JP-8, the type of fuel we were using, and then subtracted from the fuel remaining.

As calmly as possible, I announced, “It’ll land with 200 pounds.” Coincidentally, this was our minimum landing fuel by directive. The tent went still for good after this. When the K-MAX finally came within range of our line-of-sight antennas, at a spot just short of the outside recovery point, I quickly revalidated my computation. All good.

A few minutes later, we acquired the K-MAX visually, then watched it decelerate for its programmed high hover above the landing pad. The operator wasted no time getting the load on the ground, and then the aircraft itself. It throttled back to ground idle without a hiccup.

When I climbed into the cockpit to shut down the aircraft, I went right to the fuel gauge. Its needle was dead on 200 pounds.

**Lesson Learned, Lives Saved**

We gathered lessons that day that served us well later. We learned that airmanship was a thing whether the pilot was in the machine or not, but mostly we learned to trust our aircraft. The Unmanned K-MAX blew past its planned six-month deployment in Afghanistan and delivered 4.8 million pounds of materiel, mostly under the cover of darkness, over the next 2½ years.

We used this new aircraft in ways never envisioned by the original request for proposal or later concept of operations. We retrograded material with it, bringing payloads from forward bases back to us. We hooked payloads from an unmanned hover. We dropped and picked up on the same sortie.

Above all, we saved lives. According to statistical data, one US warfighter was lost for every 100,000 pounds of materiel moved in a ground convoy. The 4.8 million pounds moved by the Unmanned K-MAX Program equated to 48 men and women who would have otherwise been lost. That number is what it was all about.
MY PLAN was to visit commercial helicopter operators fighting wildland fires in the western United States. It seemed there were fires everywhere, some springing up overnight, and every operator I spoke to said, “Sure—come on out!”

I’d ask, “Where should I meet your folks?” and they’d reply, “Not really sure where they’ll be.”

“When should I be there?” They’d respond, “Can’t really say.”

So with a car full of cameras, beef jerky, and energy drinks, I set out on a journey of discovery and happenstance. And you know what? It worked out just fine.
On the Trail of the Dragon Slayers
This page, clockwise from above: A Firehawk AS350 B3 at Reno-Stead Airport (KRTS), Nevada, awaits its call to duty; A ROTAK K-MAX faces another firefighter, a Boeing 747, in the distance at Sacramento McClellan Airport (KMCC), California; A pair of Helicopter Transport Services CH-54B Skycranes share the ramp at San Bernardino Airport (KSBD), California.

Opposite page, clockwise from upper right: Interior of a HeliQuest B205 at Arroyo Grande Forest Service Station, California; Crew chief Morgan Oldenberg inspects the HeliQuest K-MAX at Casitas Forest Service Station, California; General William J Fox Airfield (KWJF) in Lancaster, California, hosts a WorldWind B205A-1; PJ Helicopters prepares to launch an MD 530F from its Red Bluff, California, facility.
WHAT I DISCOVERED in my travels were a lot of aircraft and crews sitting. Waiting. Prepared to go. Willing to go. But not going, because no one had called for them. So I came home with many interesting photos of machines sitting, waiting. Those are not the money shots but do illustrate the reality of wildland firefighting, where weather, terrain, and the discarded cigarette rule your future days.

Sometimes they sit alone, sometimes with a brother, and sometimes they wait with distant cousins. Dawn to dusk, from mountaintop to big-city airport, they are manned by dedicated crews who could not so much as spin up the rotors for a photo because a call could come at any second—and every second counts.
NOT EVERY HELO WAS STATIC. I found them flying in the mountains above L.A. and the nether ends of California’s Central Valley, and in the canyons south of Salt Lake City.

What were these aircraft doing in the air? Some were sucking up water and dousing the dragon, like the Erickson S-64F shown sucking and dousing on the opening pages of this essay, or filling a Bambi and heading back to the fire like this Krassel Helitack AS350 B3 at left. Other aircraft were captured aloft, checking out a report of smoke, reconnoitering a blaze, trucking around crews and matériel, or just stopping by for a refueling.

My thanks go out to the many men and women—operators, flight and ground crews, and government employees—who welcomed me into their midst and shared their skill and knowledge. These images are the result of their cooperation and, hopefully, are a testament to their dedication and successes.
Above: Pilot Nathan Husbyn turns the rotors of the Swanson Group Aviation K-MAX at Chester Helitack, California. Clockwise from top: A HeliQwest B205++ arrives back at Heaps Peak Helibase, California; A Siller Helicopters S-64E Aircrane stops by General William J Fox Airfield in Lancaster, California, for refueling; Helicopter Transport Services’ CH-54B “Iron Maiden” heads off with another load of water to fight the Pole Creek Fire, near Salt Lake City, Utah; A Mountain Air Helicopters AS350 B3 departs Spanish Fork-Springville Airport (KSPK), Utah.
With barely 14 months left before the January 1, 2020, mandate for ADS-B installation, it is now crunch time. Most aircraft have one more maintenance cycle before that due date to facilitate the installation of your chosen system. Assuming you haven’t equipped yet, this article will give you the information you need to make your ADS-B equipage decision.

The ADS-B Out Mandate
Both transponders and ADS-B Out are simply surveillance equipment. The transponder and corresponding radar system date back to the 1930s, relying on a radar “ping” to measure your distance and establish your location.

At a little more than a decade old, ADS-B Out is the modern version of this surveillance. It uses own-ship determination of location and then broadcasts your location to the FAA’s NextGen Traffic Management System. ADS-B will allow air traffic controllers to put more aircraft in the same space with closer margins and accuracy.

14 CFR 91.225, which sets forth the regulations for ADS-B Out equipment and use, requires that aircraft be equipped with ADS-B Out for access to rule airspace. It further defines the scope and limitation of rule airspace. You are encouraged to review 14 CFR 91.225 paragraphs (a) and (d) to become familiar with the airspace that will require ADS-B Out equipment, or see figure 1 (p. 42), which graphically shows the rule airspace.

For our purposes today, let’s make it simple: generally, airspace requiring a transponder today will require ADS-B Out at the start of 2020. And conversely, if you don’t fly in airspace that requires a transponder, then you probably don’t need to equip with ADS-B.

In addition to the confusion regarding who is and is not required to be equipped, many people focus on the label ADS-B and assume that ADS-B Out and ADS-B In are the same thing. They are not! ADS-B Out is used for surveillance; ADS-B In is used to send flight information into the cockpit. They are two distinctly different systems. More importantly, these two systems are treated completely differently by the FAA. Installation of ADS-B Out is mandated because it will provide the primary source of surveillance in the NextGen Traffic Management System.

While not mandated by the FAA, ADS-B In provides pilots with a wealth of information, such as weather and traffic information. Please see Zac Noble’s article on p. 46 to learn more about how pilots will benefit from ADS-B In.

ADS-B In installations are treated as normal avionics work—nothing special. In general aviation, the majority of ADS-B In installations are for supplemental information. If, however, ADS-B In will be used for required information such as a Part 135 weather briefing, then approval of the system requires more FAA involvement.

By Ric Peri

With barely 14 months left before the January 1, 2020, mandate for ADS-B installation, it is now crunch time. Most aircraft have one more maintenance cycle before that due date to facilitate the installation of your chosen system. Assuming you haven’t equipped yet, this article will give you the information you need to make your ADS-B equipage decision.

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Here’s what you need to know to create your ADS-B Out compliance plan
Who Should Equip

There are two questions that affect your equipage decision: will the due date be extended, and do you fly in rule airspace?

Let’s first address the due date. Will the FAA extend the January 1, 2020 date? The answer is most likely no.

When he was heading the FAA, Michael Huerta had repeatedly answered that question with a resounding “No, the FAA will not extend the mandate!” Dan Elwell, the current acting administrator, has also reiterated that message on multiple occasions. Still, I live and work in Washington, D.C., and as we all know, there is no such thing as a sure thing, especially in this city.

But if you rely on your aircraft, gambling that you won’t have access to needed airspace come January 1, 2020, might be a fool’s bet. And even if you equip this year and although unlikely, they extend the mandate a year or two, you won’t gain much by delaying your installation.

As to whether you need access to airspace where ADS-B Out is mandated, remember: 14 CFR 91.225 is an airspace rule, not an aircraft rule. ADS-B Out doesn’t make your helicopter fly higher, faster, or longer—it simply gives you access to airspace. If your desired airspace requires ADS-B Out, the aircraft must be equipped. If the airspace does not require ADS-B Out, then you don’t need it.

Choosing ADS-B Out Equipment

ADS-B Out is considered a system, not just a radio. It is a system that contains a transmitter and a reliable position source (usually a WAAS (wide area augmentation system) receiver). Let’s look at some of the major decisions you will make when choosing ADS-B Out equipment (or see figure 2, page 45, which contains a summary of this information).

The Transmitter

In the United States, the FAA allows two different technologies for the transmitter:
- A universal access transceiver (UAT) broadcasting on 978 MHz, or
- A Mode S transponder with extended squitter broadcasting on 1090 MHz.

In the rotorcraft world, you don’t need to worry about class A airspace (above 18,000 feet); traffic in that airspace must use Mode S transponders. Therefore, you can utilize either UAT 978 transmitters or Mode S transponders — whichever is right for you.

The answers to a few questions can steer you in the right direction. Because ADS-B Out equipment broadcasting on 1090 MHz is normally incorporated in a mode S transponder (equipment that broadcasts on 978 MHz is normally stand-alone equipment), one factor in determining your transmitter choice is the age of your current transponder.

If you need to replace your transponder or you anticipate replacing it in the near future, upgrading to a Mode S transponder with extended squitter is a good option. Keep in mind that most legacy avionics have a useful lifespan of around 20 years. If your transponder was installed before 2000, it might be time to look to a Mode S transponder with extended squitter and solve both problems at once.

Another reason you might want to consider the Mode S transponder is that Part 135 requires all transponders replaced after January 1, 1992, to be replaced with the appropriate class of TSO-C112 (Mode S) transponder. It doesn’t matter if the aircraft was operated under Part 135 at the time of transponder change. If you are operating under Part 135 and your transponder was installed after January 1, 1992, you must install a Mode S transponder.

The United States is the only aviation authority utilizing dual frequencies for ADS-B Out, so if you are located near the northern or southern borders and anticipate flying internationally, you should choose the Mode S transponder with extended squitter solution.

And finally, if you fly with a dynamic flight ID, where you change your call sign based on your mission, you might want to consider a Mode S transponder. It allows the pilot the capability to change the flight ID from the cockpit. Changing the flight ID on most UAT systems is a ground/maintenance action. AC 120-26M, issued September 10, 2018, which clarifies requirements and procedures for the use of aircraft call signs in the National Airspace System, states that the aircraft operator’s ADS-B flight identification must correspond with the aircraft identification filed in the flight plan.

The size, space, and installation issues of either transmitter choice aren’t much of a consideration. While a transponder replacement is certainly the least real estate change, component for component, the
additional wiring and antenna for Mode S solutions tend to be on par with a UAT system. In addition, UAT systems are so small that they don’t take up much space.

**The Position Source**

Now let’s look at position sources. The position source needs to provide an accuracy equivalent to that of primary radar while on short final. While a WAAS receiver was never required in the regulations, the practical application of the accuracy requirement drives general aviation to a WAAS receiver.

Does your aircraft already have a WAAS receiver/navigator or are you installing a new navigator with WAAS capability? If the answer is yes, then you simply need to marry that system with your chosen ADS-B transmitter. The FAA requires that all ADS-B Out transceivers be certified with approved WAAS receivers via an supplemental type certificate (STC). This is referred to as an “approved pairing.”

If you do not have a qualified navigator and don’t plan to install one, you would be looking for an ADS-B solution with a dedicated WAAS receiver, either as an internal component of the ADS-B Out transceiver or as an available approved external component.

**Minimizing Installation Issues**

Now that you have chosen which system to install, let’s discuss some of the issues that may arise during equipage.

**Qualifications of ADS-B Installers**

I suppose the first question is always, who is allowed to install ADS-B Out? And that answer is simple: anyone who is qualified.

14 CFR 65.81(a) prohibits a mechanic from approving and returning to service any maintenance or alteration unless they have “satisfactorily performed the work concerned at an earlier date.” While ADS-B Out may be contained within a transponder, it is not a transponder but rather programmable avionics. Training, experience, and qualification with ADS-B Out systems is required.

In addition, 14 CFR 43.13(a) requires the mechanic to “use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices.” And “if special equipment or test apparatus is recommended by the manufacturer involved, he must use that equipment or apparatus or its equivalent acceptable to the Administrator.” So having the proper test equipment is also a regulatory requirement.

And finally, 14 CFR 91.413(b) requires that following any installation of an ATC transponder, the integrated system must be tested, inspected, and found to comply with paragraph (c), appendix E, of part 43 of this chapter. 14 CFR 91.413(c) specifies who may perform these tests and inspections and unfortunately, a certificated mechanic isn’t authorized to perform them. Only certificated repair stations, those who hold a continuous airworthiness maintenance program, or an aircraft’s OEM can conduct these tests and inspections.
Relevant Installation Guidance
The FAA has three documents that contain guidance for the installation of ADS-B equipment. Your installer—and if possible, you or your mechanic—will need to be familiar with all three of these documents:

- **FAA AC 20-165B: Airworthiness Approval of Automatic Dependent Surveillance - Broadcast Out Systems.** This AC provides guidance for the installation and airworthiness approval of ADS-B Out systems in aircraft. While the AC is mostly used by ADS-B manufacturers, it contains important and needed information for the proper installation and, especially, the configuration of the ADS-B Out system. See in particular paragraph 3.2.3, Configuration of Associated Parameters, which provides guidance on setting key ADS-B Out parameters.

- **FAA Field Approval Guidance, Policy Number: AFS-360_2016-03-02.** This document explains the agency’s policy regarding installation of ADS-B Out systems into civil aircraft. There are two key points. First, the policy is clear that ADS-B Out systems that have previously received FAA approval via type certificates, supplemental type certificates, or approved type certificates, and that meet certain specified conditions may be installed and returned to service on other aircraft without further data approval. And second, the policy spells out the nine specific requirements for follow-on installations.

- **FAA Technical Paper AFS-360-2017-1 (Rev 0, 09/25/2017), Installation of ADS-B Out Equipment.** The companion document to the Field Approval Guidance, this technical paper explains and clarifies the FAA’s policy regarding alterations to aircraft for the installation of ADS-B equipment and, in some cases, provides guidance on how you can comply with the policy’s requirements.

Why are these documents important?
Because we have been struggling for more than five years with a double-digit error rate with installed ADS-B equipment. Prior to 2018, 11 percent of the installed ADS-B Out systems were classified as non-performing equipment (3,253 per 28,930). Fortunately, through outreach and education, the industry has been able to reduce the NPE rate for 2018 to below 8 percent.

Common Installation Issues
The FAA is working with operators, manufacturers, and installers on eliminating common ADS-B installation errors. The most common issues associated with an ADS-B installation are:

- Missing barometric pressure altitude
- Air/ground determination issues
- Flight ID issues, including missing flight ID three-letter identifier
- Duplicate and wrong ICAO codes
- Invalid mode 3/A code (mitigation in place)
- Incorrect emitter category
- Aircraft with position errors.
The best way to minimize installation errors is to:
- Use a trained and qualified installer
- Follow the installation manual
- Be familiar with and follow AC 20-165B
- Use the proper test equipment
- Conduct an operational flight evaluation and request an FAA ADS-B compliance report.

**Next Steps**
When this magazine hits mailboxes, you will have approximately 280 working days until January 1, 2020. But don’t wait until the last minute. As the deadline approaches, the queue at avionics shops will continue to grow, so schedule early.

It’s now ADS-B Out decision time! How will you equip?

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**Figure 2. Choosing Your ADS-B Out Solution**

Do I fly or plan to fly in the rule airspace? (See Figure 1)

**YES**
OK, so let’s look at what you need to do to equip.

When choosing your ADS-B Out solution, there are two major questions to answer:

**TRANSMITTER: UAT 978 Transmitter OR Mode S Transponder?**

*In the United States, you can choose from two types of transmitters:*

**UAT 978**
*Universal Access Transceiver Broadcasting on 978 MHz*

The choice between a UAT and Mode S transmitter is up to you and your aircraft, unless you meet one of the conditions listed under Mode S

**Mode S Transponder with Extended Squitter Broadcasting on 1900 MHz**

Choose this transmitter solution if you:
- Fly in Class A airspace
- Have a transponder that was installed before 2000
- Fly under Part 135 and have a transponder installed before Jan. 1, 1992
- Fly or will fly internationally
- Fly with a dynamic flight ID

**POSITION SOURCE: Stand-Alone WAAS System OR ADS-B Solution with Dedicated WAAS Receiver?**

ADS-B Out requires a reliable position source, which for general aviation means a WAAS receiver/navigator. Your choice here is to determine what kind of WAAS system you need:

**I Have or Am Planning to Have WAAS Installed**

If this describes you, then plan on marrying your WAAS system with your chosen transmitter system via an STC

**I Don’t Have WAAS Installed**

If you do not have a WAAS receiver and don’t plan to install one, look for an ADS-B solution with a dedicated WAAS receiver, either as an internal component of the ADS-B Out transceiver or as an approved external component

Now that you have selected your ADS-B Out equipment, talk to your avionics shop and schedule your installation today!
THE LAST TIME the general aviation community had to deal with a regulatory mandate as big as the January 1, 2020, requirement to have ADS-B Out (automatic dependent surveillance–broadcast out) installed in your aircraft was when the FAA required aircraft owners and operators to equip their machines with a transponder if they were to operate in rule airspace under Part 91.215.

Now with the deadline barely a year away, we are faced with another mandate by the FAA to upgrade our aircraft.

In the United States, there are about 170,000 general aviation aircraft, of which more than 10,000 are helicopters. Many of these aircraft owners will elect to equip their machines with the newest technology but some will choose not to, based on a host of reasons.

Should I Equip?
I hope you have read Ric Peri’s excellent article on ADS-B Out (p. 40), which goes into detail about the rule airspace where the ADS-B Out mandate will apply, as well as guiding you through some of the equipage process. I would only add that it is possible to fly from coast to coast without ever hitting that airspace. If you don’t fly in rule airspace—and you don’t anticipate flying in rule airspace—then you are not compelled to equip under the January 1, 2020, mandate.

If your aircraft does not have an engine-driven electrical system, then it is not required to have ADS-B Out. Under this scenario, however, it would most likely not have a panel-mounted radio either, so chances are you are not in the airspaces affected by the ADS-B Out mandate anyway.

How Much Will This Cost?
At this point, you should have realized the FAA really means what they have been saying all along. They are not going to shift or move the goal line: January 1, 2020, is the date.

Fortunately, your procrastination has paid off because the costs of equipping have come down drastically during the past five years. Manufacturers and the free market have answered the call, and there are many solutions on the market. Like anything else, you can find both high-end and basic packages—some as low as $1,700.

ADS-B Out / In: What’s the Difference?
ADS-B Out broadcasts data from your aircraft, including its position, altitude, speed, and other data. This data is available to the FAA’s NextGen Traffic Management System, as well as any aircraft equipped with ADS-B In.

An entirely different system, ADS-B In enables pilots to receive information in flight. In addition to proximate traffic information, ADS-B In brings a wealth of additional meteorological and aeronautical data into the cockpit.

Do I Have to Have ADS-B In?
No. The data being broadcast from your aircraft provides ATC with the information they need. It is not their concern whether you take advantage of the many benefits of ADS-B In. The equipage deadline of January 1, 2020, only applies to ADS-B Out.

Why Should I Equip with ADS-B In?
As a pilot, I see ADS-B Out as something that my regulator is requiring. It’s for them. ADS-B will allow air traffic controllers to put more aircraft in the same space with closer margins and accuracy.

But ADS-B In is for me. (Yes, I know that the entire National Airspace System will benefit from NextGen, but I’m taking a moment to just focus on how this affects the individual pilot.) The benefits of ADS-B In is the carrot that makes this entire exercise of ADS-B equipage worth the exertion.
Here are some benefits:

- Traffic displayed in your cockpit on your panel avionics screen or tablet
- Maximum present position accuracy (often 1 meter) available to ATC and yourself
- Subscription-free weather and NOTAMs
- Up-to-date TFR data.

Is More Technology a Good Idea?

Here is where my traditionalist, old-school mentality collides with modern technology. I am all for a pilot being able to fly from sea to shining sea with only basic instrumentation. There is nothing like getting back to your roots in a Scott’s Bell 47, Piper Cub, or Cessna 140. The FAA has obliged us minimalists with the ability to not equip our aircraft, as long as we do not attempt to fly it in airspace requiring equipage, and I am very happy about that.

Yet, flying with ADS-B Out and In for more than two years has made me wonder how we flew and survived without it. In fact, now I am paranoid when I get in an aircraft with someone who does not have this equipment installed. I have witnessed all that we could not see before.

The situational awareness ADS-B In provides is beyond imagination. I have real-time traffic displayed with direction and altitude relative to my position. I have current weather displayed on a moving map, along with ATIS (automatic terminal information service), AWOS (automated weather observing system), and wind aloft data updated within minutes. Moving maps display up-to-date TFR rings.

There have been times when I was in positive control of ATC and, after I reported possible traffic conflicts to ATC, I then received course deviations for separation. I have been at uncontrolled airports with several aircraft in the pattern and someone not talking on the radio—and I knew exactly where everyone was, including traffic that would have been unaccounted for previously.

ADS-B In is a game changer for safety and situational awareness. It has been said your aircraft should not be at a location where your brain did not arrive 15 minutes earlier. This technology will help you do that.

How Do You Really Feel About ADS-B?

I highly recommend every pilot equip their aircraft with ADS-B In. Yes, it’s that good.

Fugere tutum!
WHAT HAPPENS after you violate a Federal Aviation Regulation (FAR)? There have been some changes recently in how the FAA handles the process.

Prior to 2015, the enforcement action was the FAA’s primary method for dealing with violators. The agency could initiate an enforcement action, which could include a fine and either suspension or revocation of a certificate, against any FAA-certificated entity, including operators, pilots, maintenance technicians, repair stations, and equipment manufacturers.

In 2015, the FAA adopted a program known as the Compliance Philosophy. An attempt to embrace a just culture, the Compliance Philosophy is built around the idea that very few people get up in the morning thinking about how unsafe they plan on being that day. Most FAR violations are the result of honest mistakes, lack of knowledge, or lack of skill. In a just culture, people are encouraged to admit to their mistakes, and the goal is to improve safety—not to punish.

The FAA announced that it would focus on returning violators to compliance with the FARs and improving safety in the National Airspace System. Thus, the compliance action was born. If you haven’t heard of it, then read on, because the FAA has changed how it deals with some FAR violations.

Letter of Investigation
You usually first learn that the FAA believes you have violated an FAR when you receive a letter of investigation (LOI). The LOI usually ends with the following invitation to discuss the incident with the FAA: “We wish to offer you an opportunity to discuss the incident in person or submit a written statement…. Your statement should contain all pertinent facts and any mitigating circumstances…. If we do not hear from you within the specified time, we will process this matter without the benefit of your statement.”

Your first inclination may be to immediately respond to the LOI,
but first, take a moment. Consider whether a response is appropriate and what that response should be. There is no obligation to respond to an LOI—the FAA will neither penalize nor reward you for responding. Furthermore, any statements you make in your response can be used against you. In fact, there are cases where the response to an LOI helped the FAA prove its charges. Because the decision of whether to respond to an LOI and what to say depends on the particular facts of your case, talk with your attorney before responding to an LOI.

An FAA investigation commenced by an LOI can end in one of four ways:

- No violation found
- Administrative action
- Enforcement action
- Compliance action.

Of course, the best outcome of an investigation is the FAA finding no violation. Another option is the route of an administrative action. This does not result in a violation against you, but typically the FAA will issue a warning notice (that stays on your record for two years) or a letter of corrective action for you to take.

Enforcement Action
The penalties of an enforcement action come in two types. The FAA can issue a notice of proposed certificate action, which either proposes to suspend or revoke your certificate. It can also issue a notice of proposed civil penalty, which proposes a fine.

If you receive either of these notices during an enforcement action, you can submit any evidence favorable to you and request what is known as an informal conference with the FAA. Bring your legal counsel. At the informal conference, the FAA will hear the information you want to present and consider whether this information should affect the proposed action.

As stated by the FAA in its Enforcement Manual: “The FAA does not use the informal conference to gather additional evidence or admissions to prove the charges in the enforcement action. The FAA, however, may use any information revealed by the apparent violator for impeachment purposes if the apparent violator makes a contrary statement about a material fact later in the proceeding.” Thus, when speaking with the FAA, speak carefully, as misstatements can be used against you.

If you are unsuccessful at having all charges withdrawn at the informal conference, then the FAA will issue an order that suspends or revokes your certificate and/or results in a fine. An FAA order suspending or revoking a certificate can be appealed first to the National Transportation Safety Board and then to the federal courts. An FAA order that fines an operator is generally appealed to the Department of Transportation and then also to the federal courts.

Compliance Action
The FAA’s fourth method for dealing with violations of the FARs is the compliance action, which is relatively new. The FAA refers to a compliance action as a nonenforcement method because, if you are offered a compliance action and meet its requirements, then you avoid a violation, which is clearly to your benefit.

Whether to offer a compliance action to a suspected violator, as opposed to pursuing an enforcement action, remains within the discretion of the FAA. However, there are some things that you can do to tilt the odds in your favor. First and most important, compliance actions are only available if the FAA determines that you have not willfully violated the FARs. The FAA says it will have “zero tolerance for intentional or reckless behavior,” and these cases will still be subject to enforcement actions.

The next test you must meet is to be “able and willing” to cooperate with the compliance action. The compliance action is designed to set up an honest and transparent dialogue between you and the FAA about what you did, what went wrong, why it went wrong, and how you will avoid similar situations.

The FAA uses that information to develop corrective measures to return you to compliance. If you complete these measures, you should avoid a violation. The goal, after all, is not to punish you but to return you to compliance with the FARs.
Generally, a compliance action ends with the completion of retraining or counseling, as opposed to a fine or suspension. You must be willing and able to comply with all the terms of the compliance action, including paying all training costs.

Another factor that could increase your chances of receiving a compliance action is having an effective safety management system (SMS) program. Why? This means you have a vibrant safety culture, where you and your colleagues actively work to identify safety hazards, engage in risk analysis and mitigation, and fine-tune your efforts based on results. Notice, I said an effective SMS program; the dusty manual on your shelf doesn’t count.

According to the FAA, under its Compliance Philosophy, it “will encourage a more proactive approach by airports, airmen, and organizations to disclose and develop measures that identify safety risk, prevent deviations, and ensure corrective actions are taken when deviations exist.” If you operate under an SMS, then the Compliance Philosophy’s focus on open communication, hazard identification and mitigation, and training should sound familiar.

The FAA has made clear that your retention of an attorney does not prevent you from obtaining a compliance action. Further, an initial refusal to respond to an LOI does not prevent you from obtaining a compliance action. However, once a compliance action has commenced, then you must voluntarily share information with the FAA.

Further, once you agree to enter into a compliance action, you must make a strong effort to remain in the program. If you are removed from a compliance action—maybe you never got around to completing your remedial training—the required disclosures you made as part of the compliance action can be used against you in an enforcement action.

Another balancing act that you and your counsel must undertake is this: if the FAA has not yet offered a compliance action, should you request one? While that answer will depend on your specific circumstances, I can tell you this: if you decide to request a compliance action, you must do so in such a way as to ensure that you are not admitting to certain things before you know you have the protection of a compliance action. If you are being investigated by the FAA and you wish to receive a compliance action, and one has not yet been offered, discuss with your attorney the best way to present the request to the FAA.

**Embracing a Just Culture**

The Compliance Philosophy should be viewed as a benefit for all of us who are certificated by the FAA. The FAA is clear that it will launch enforcement actions against those who are reckless or who do not want to comply with the FARs. And that’s as it should be—we need our regulator to keep us safe from those guys.

However, for those of us who make an honest mistake, have a temporary lapse of judgment, or let our skills get rusty, the alternative of a compliance action is a welcome change from an FAA that has embraced a just culture.
Roy Simmons: A Life in Helicopters

By Martin J. Pociask

WITH HIS HUMBLE BEGINNINGS in the small farming area of Parkrose, Oregon, Roy Simmons never dreamed that he would have a distinguished career in aviation.

A past chairman of Helicopter Association International (HAI) and past president of Columbia Helicopters, Simmons has received many accolades over the years, including HAI’s Distinguished Achievement Award in 1999. With more than 5,000 hours of total flight time between his military and civilian service, Simmons has held FAA commercial pilot, rotorcraft, single-engine land, instrument, and instructor ratings, in addition to type ratings in Boeing Vertol 107-II, Sikorsky S-61, and Sikorsky S-58 helicopters.

Military Service

After college, Simmons’s attention turned to aviation. From 1957 to 1958, he attended naval flight school as a cadet in Pensacola, Florida, where he received fixed-wing and helicopter training. Simmons then served in the US Marine Corps from 1958 to 1963, leaving active duty with the rank of captain.

Simmons flew both helicopters and airplanes in various squadrons in the United States, overseas in Japan, and aboard carriers in the South Pacific. “My overseas tour of duty was spent in Okinawa,” Simmons says. “It was an interesting assignment, as I was assigned to a marine observation squadron, flying both helicopters (the HOK-1 [later designated as the OH-43D]) and fixed-wing (the Cessna OE-1 [later designated the O-1B]). We were the only marine aviation unit on the island supporting a marine division. Our mission was flying search and rescue with the helicopters and using the airplanes for flying aerial observers and forward air controllers.”

“I also spent several months during my 15-month overseas tour of duty on an aircraft carrier. I attended Embarkation Officers School, where I learned how to load vehicles, supplies, and aircraft onto navy ships. I was in charge of several shipboard movements during my overseas assignment. In early 1960, I was reassigned to another marine observation squadron at Camp Pendleton, California, helping to train pilots for their upcoming tours of duty overseas.”

Simmons spent the last two years of his active duty at the Marine Corps Air Facility in Santa Ana, California.
flying the Sikorsky HR2S-1 (later designated as the CH-347). “At the time, the HR2S was the largest helicopter in the free world,” says Simmons. “It had two Pratt & Whitney R-2800 radial engines and could carry about 32 troops or several jeeps internally. It had clamshell doors in the nose with a hydraulic ramp for loading vehicles. It was a great instrument helicopter and very stable to fly under instrument conditions.

“However, I was always up on my emergency procedures, as most every flight was an emergency in the making. I spent several nights in the Okefenokee swamps of Florida; made an emergency landing in the desert near Tucson, Arizona; and made a single-engine night GCA [ground-controlled approach] into Fort Ord, California, with 28 troops in the belly. After those incidents, I decided I had all the fun I could handle and asked for release from active duty in 1963.”

After leaving active duty, Simmons was a member of the US Marine Corps Reserve from 1963 to 1969, drilling in Seattle, Washington. After having attained the rank of major, he left the reserves when the demands of his civilian job became too pressing and included extensive travel time.

Civilian Career
While serving in the reserves, Simmons also worked for JN Conley, a medium-sized heavy-construction contracting company in Portland, Oregon. Simmons flew a Hughes 269A helicopter, working as a subcontractor administrator for the company while overseeing the weekly payroll of approximately 300 employees. He also managed most of the company’s insurance programs.

“I traveled with the owner of the company many times, which I considered to be an education in not only the construction industry but many aspects of business in general,” Simmons says. “I learned more from that man in four short years than I could have learned from college classrooms. He spent time explaining some of his shortfalls over a lifetime of being in business and taught me how to bid and estimate future jobs.”

In 1966, Wes Lematta, founder and owner of Columbia Helicopters Inc. (CHI), hired Simmons as a line pilot; the company was only nine years old and still quite small. Simmons’s career with Columbia spanned 33 years and was marked with numerous career advancements. He rose from line pilot to chief pilot, to operations manager, to director of flight operations, to
vice president of flight operations, and then to executive vice president. Simmons became president of CHI in 1992, a position he held until 1999. He also served as a member of CHI’s board of directors.

Simmons's efforts during Columbia’s first overseas work with the Boeing Vertol 107-II helped make a company specialty of onshore oil rig moves in some of the world’s most remote and inhospitable locations. His commitment to extensive employee training resulted in Columbia receiving six FAA Diamond-level awards for its maintenance training program.

"CHI pioneered many external load operations with their Boeing Vertol 107 and 234 helicopters," says Simmons. "We also pioneered helicopter logging with both Sikorsky S-61 and S-64 helicopters. CHI was the first commercial helicopter company to recover US Navy torpedoes with the BV 107."

**Giving Back**

Simmons has a long history of close involvement and service with HAI. Simmons has attended every HAI HELI-EXPO since 1972, until recent health concerns restricted his travels. He has been a member of the Twirly Birds since 1978, having soloed at Naval Air Station Ellyson Field in Pensacola, Florida, on September 8, 1958, in a Bell HTL-6. Simmons was the 2014 recipient of the Twirly Birds’ Les Morris Award—a lifetime achievement award given to an individual who has made a significant contribution to the helicopter community.

Simmons also actively participated in the HAI Aerial Forestry and Government
Contracting Committees, and he was the board liaison for the Legislative and Restricted Category Aircraft Committees. Simmons served on the HAI Board of Directors as assistant treasurer, treasurer, and vice chairman and became HAI chairman in 2004.

In early 1999, Simmons retired from Columbia after developing age-related macular degeneration. At his retirement, Wes Lematta, Columbia’s owner, said, “The success of this company is largely due to Roy.”

A family man, Simmons married JoAnna Rood on November 12, 1958. They have two children and two great-grandchildren. Simmons is an avid supporter of the helicopter community and safe practices.

“Safety was and always has been important to me,” says Simmons. “Safety remains paramount!”

He is also an active supporter of Helicopter Foundation International (HFI). In 2012, Roy and JoAnna Simmons graciously donated $50,000 to the HFI Scholarship Fund to help educate tomorrow’s pilot and maintenance professionals.

“I wanted to give back to the industry a small token—to assist the industry that has been so wonderful to me over many years,” says Simmons. “We old-timers need to encourage, in the best way we can, the young folks to get into our industry with a most rewarding career.”

“Because of Roy’s generosity, aspiring pilots and maintenance technicians have been able to complete their education and pursue their passion through HFI,” says Allison McKay, vice president of HFI.

In closing, Simmons has the following advice for tomorrow’s young pilots and mechanics: “Take your training seriously. Listen carefully to those with experience. There are many experienced pilots and mechanics out there who can do you a lot of good. Listen and learn, but don’t overextend yourself. And most of all, enjoy yourself — it will allow you a wonderful and fulfilling career.”

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**TRAILBLAZERS continued**

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- **Michelle North Scholarship for Safety:** awarded to a pilot who has already attained a commercial rating and demonstrates an outstanding aptitude for safe flying and aviation best practices
- **New This Year! Southern Utah University (SUU) Rotor Wing Pilot Program Scholarship:** provides up to $20,000 toward the SUU aviation commercial/instrument flight lab for pilots pursuing helicopter ratings up to CFI
- **Bill Sanderson Aviation Maintenance Technician Scholarship:** awarded to up to eight students, each of whom can attend a course offered by helicopter airframe and powerplant manufacturers.

To learn more and apply, visit [rotor.org/scholarships](http://rotor.org/scholarships)

Submit your completed application and all necessary documentation before midnight EST Nov. 30, 2018.
Building an Aviation Pipeline

A Florida high school’s solution: a four-year maintenance program for students

WITH THE AVIATION industry in the grip of a shortage of both pilots and maintenance technicians, officials at Seminole County Public Schools (SCPS) in Sanford, Florida, are preparing students for these in-demand jobs.

The Aviation Maintenance Academy offers SCPS students a chance to learn about aviation before leaving high school. While the academy focuses on fixed-wing aviation, it could serve as a model for the helicopter industry. ROTOR spoke to Jason Wysong, executive director of Education Pathways and Strategic Partnerships for SCPS, for insight on the program.

Why start the academy?

Wysong: The Orlando-Sanford International Airport (KSFB) is an important pillar of the Seminole County economy. In June 2017, meetings with leaders from the airport authority and its anchor business partners clearly established a local need to improve the talent pipeline into the aviation industry.

As a gauge of student and community interest in aviation, the stakeholders partnered to host Aviation Day at the airport on December 9, 2017. The goal for this event was to expose students and parents to different career pathways available within the aviation industry. The event was open to SCPS students and families in grades 4–12, and estimated attendance was more than 2,500. Due to overwhelmingly positive feedback, the steering committee is planning for future annual events.

After nearly three years of research, construction, and procurement, the Aviation Maintenance Academy at Seminole High School began in August 2018 as one of four programs in the school’s new Career Education Building. The high school is located just 4 miles from the airport, so departing and arriving aircraft are regularly visible in the skies above the campus.

How does the program work?

The Aviation Maintenance Academy is open to all students at Seminole High School. There are no prerequisite requirements, and there is no financial cost to participate. A licensed A&P mechanic has been hired to lead and teach in the academy.

Students take one course per year for up to four years of focused study on airframe and powerplant systems. While students graduating from the academy will have earned no credit toward obtaining an A&P license, the hands-on experience will help them decide if aviation maintenance is a good career for them and will prepare them for success at an A&P program.

Currently, we are following the Florida Department of Education secondary frameworks, which outline the standards the curriculum must cover. As we continue to develop the program, we will consider becoming an FAA-certified program, depending on what is best for students.

Students can also participate in two aviation dual-enrollment courses offered by Embry-Riddle Aeronautical University. A Program Advisory Committee comprised of local aviation employers, airport officials, and other industry experts will identify additional sources of support for long-term program planning and resource sustainability. The committee will also collaborate to connect students with local employers for internship, apprenticeship, and employment opportunities.

What makes your program unique?

Students who attend any of the school district’s nine high schools can take aviation maintenance at Seminole High School in an after-school format for four hours each week. This allows all high school students in the district to participate.

What is your biggest challenge?

The biggest challenge thus far has been recruiting the initial cohort of students. Now that the program is open and equipment is in place, we believe that many students will sign up in future years. Moving forward, identifying financial resources for acquisition of new equipment will be a priority.

What has been your greatest success?

We are excited that the program opened on time, on budget, and with 76 students enrolled!

What advice would you give to others looking to start a similar program?

Allocate plenty of time to meet with local business partners to determine their needs and interest in supporting the program. We have learned that our local aviation community is committed to educating students and taking a long-term approach to developing their future workforce.
DOUG SENA’S EXPERIENCE AND PASSION are what made him stand out as an applicant for Helicopter Foundation International’s (HFI) 2018 Bill Sanderson Aviation Maintenance Technician (AMT) Scholarship. This scholarship is offered by HAI’s Technical Committee to promote the choice of helicopter maintenance as a career. Each AMT scholarship winner gets the opportunity to attend a course in helicopter airframe or engine maintenance offered by manufacturers.

After joining the US Army in May 1985, Sena attended flight school and then the UH-60 Black Hawk transition course in 1986. He was assigned to both the 5th Squadron, 17th US Cavalry Regiment and the 1st Battalion, 3rd Aviation Regiment. Once he left active service in 1991, he entered the corporate world, becoming a senior scientist working for a Fortune 500 company developing packaging materials.

After raising a family, Sena and his wife began looking forward to the next phase of their lives. They both planned career changes to fields that have always attracted them, but they never quite committed to—until now.

In January 2016, Sena went back to college to obtain an Associate of Science degree in aviation maintenance technology from Cincinnati State Technical and Community College. By the end of 2018, he plans to have the NCATT Aircraft Electronics Technician Certification, his A&P certificate, and a CFI rating. He currently holds an FAA commercial pilot certificate in both helicopters and airplanes.

To continue learning, Sena applied for and won an HFI 2018 Bill Sanderson Aviation Maintenance Technician Scholarship to attend the MD Helicopters 500D/E maintenance training course, his No. 1 choice. “The training opportunities offered by this scholarship are unique and would be practically impossible to do on my own,” says Sena. After he completes his education, Sena will look for a full-time professional civil aviation career based in either the Midwest or northwestern United States.

For those considering a career change, Sena advises: “Everyone’s situation is unique, but when considering a major career change, you need to answer the following questions:

1. Do you have enough? For example, can you live on a reduced income?
2. Have you had enough? Are you ready to make the change?
3. What are you going to do? This should be your passion.

If you are able to provide positive responses to all three questions, then you are ready for a change,” he says.

All Bill Sanderson scholarship winners are awarded funds to assist with the travel and accommodation expenses associated with their chosen training. They are also invited and encouraged to attend the HAI Technical Committee meeting held during HAI HELI-EXPO. In addition, they also receive:

- Complimentary three-year HAI membership
- Complimentary full registration for the scholarship recipient and a guest for HAI HELI-EXPO, including dinner for two at the HAI Salute to Excellence Awards luncheon
- Subscription to ROTOR magazine and ROTOR Daily.

For more information about HFI or scholarships, visit helicopterfoundation.org. 📷
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Bell 222U
RG-380E/44 (42 Ah)
Falcon Crest STC No. SR09142RC

Sikorsky S-76 A, C, C+
RG-380E/44 (42 Ah)
Falcon Crest STC No. SR09050RC

Bell 206 A, B
RG-206 (17 Ah)
Falcon Crest STC No. SR09054RC

Bell 407
RG-407A1 (27 Ah)
Falcon Crest STC No. SR09359RC

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Your current role?
I currently fly for JBI Helicopters based out of Pembroke, New Hampshire. We do everything from utility work, to charter work, to agricultural assistance. I mainly fly the Bell 206 and 407 and am currently being trained on the Bell 429.

What about helicopters first captured your imagination?
I had my first helicopter flight when I was six weeks old. I grew up flying with my dad and was able to hover before I could drive a car. It seemed only natural to turn flying into a career.

What was your most memorable helicopter ride?
I’d say my most memorable flight was soloing on my 16th birthday. My family got permission to go up in the control tower and watch my three touch-and-gos. I remember that first moment lifting off the ground completely alone—I couldn’t believe how freeing that feeling was.

What are your career goals?
My career goals are pretty simple: to be the best that I can be, to never stop learning, and to make sure myself, my crew, and my passengers return home safe after every flight.

What advice would you give to someone pursuing your career path?
The best advice I can give to anyone pursuing an aviation career is to never underestimate the power of connections. This industry is small and tight-knit. Create a positive image and be as outgoing as you can be. You’ll be surprised how many doors will open for you.

What still excites you about helicopter aviation?
The thing I love about helicopter aviation is that it continues to challenge and excite me every day. No flight is the same, and there are always different elements to consider and work around.

What challenges you about helicopter aviation?
Helicopter aviation is always changing, whether it simply individual flight challenges or upgrading/learning new equipment and aircraft. Keeping an open mind and accepting change will always be a challenge—something I will happily take on.

What do you think is the biggest threat to the helicopter industry?
I know it’s been said often, but I believe that complacency is the biggest threat to all aspects of our industry. Comfort breeds complacency, and it’s important for us to recognize that natural instinct and strive to stay vigilant.

Complete this sentence:
I know I picked the right career when …
… Monday rolls around and I can’t wait to go to work!
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**Recent Accidents & Incidents**

The rotorcraft accidents and incidents listed below occurred between July 1, 2018, and September 30, 2018. All details were obtained through the official websites listed below, where you can learn more details about each event.

**ATSB (Australian Transport Safety Bureau):**
bit.ly/ATSBpub

**NTSB (US National Transportation Safety Board):**
bit.ly/NTSBrep

### July 2018

**Robinson R22**
Georgetown, TX, USA
07-02-2018 | NTSB CEN18LA251
2 injuries | Training flight
While in the traffic pattern, pilots heard the low Nr horn activate. The CFI assumed the controls, assessed the situation, and entered an autorotation.

**Hughes 369**
Pacific Ocean (Majuro, Marshall Islands)
07-04-2018 | NTSB WPR18LA188
2 fatalities | Aerial observation flight
Aircraft impacted water after takeoff from a fishing boat. The helicopter was destroyed by the impact and salt-water immersion.

**Bell 47G**
Arlington, IN, USA
07-06-2018 | NTSB CEN18FA258
1 fatality | Aerial application flight
While conducting an aerial application flight, aircraft was substantially damaged when it impacted a cornfield and experienced a postimpact fire.

**MD 369**
Hot Springs, SD
07-06-2018 | NTSB GAA18CA399
Nonfatal | External load flight
No summary provided.

**GMBH EC135P1**
Chicago, IL, USA
07-07-2018 | NTSB CEN18FA259
3 injuries | Air medical flight
During a night VMC flight, helicopter impacted terrain during an autorotation following a dual engine failure. The helicopter sustained substantial damage to the fuselage and main and tail rotor blades.

**Schweizer 269D**
Stewartstown, PA, USA
07-14-2018 | NTSB ERA18LA192
2 injuries | Personal flight
At bottom of approach to landing, aircraft began turning clockwise beyond control of available anti-torque pedal input. Helicopter impacted the ground.

**Bell 206**
New Castle, IN, USA
07-16-2018 | NTSB GAA18CA424
Nonfatal | Agricultural flight
No summary provided.

**Bell UH 1H**
Oakdale, CA, USA
07-24-2018 | NTSB WPR18LA206
1 injury | Firefighting flight
In flight, pilot reported an unusual noise. Aircraft was substantially damaged during a precautionary landing.

**Eurocopter AS350 B3**
Kobuk, AK, USA
07-25-2018 | NTSB ANC18CA056
Nonfatal | Air taxi flight
No summary provided.

**Continental Copters, Inc Tomcat MK5A**
Le Sueur, MN, USA
07-26-2018 | NTSB GAA18CA408
2 fatalities, 1 injury | Personal flight
Aircraft impacted terrain during flight.

**Bell 47J**
Franklin, IN, USA
07-15-2018 | NTSB CEN18LA269
1 fatality | Personal flight
Aircraft destroyed as a result of an in-flight collision with terrain and post-accident fire.
Bell 47G 3B  
Custer, SD, USA  
8/2-2018 | NTSB CEN18LA306  
1 injury | Training flight  
Aircraft experienced an engine power anomaly during attempted landing. Attempts to regain power failed, and aircraft landed in a grassy roadside area. The helicopter rolled to the right after landing and sustained substantial damage to the main rotor.

Brantly B-2  
Midland, MI, USA  
08-03-2018 | NTSB CEN18LA313  
2 injuries | Personal flight  
Aircraft sustained an in-flight tail rotor blade separation and impacted terrain during an emergency landing. The helicopter was substantially damaged.

Airbus EC 130 T2  
Mullen, NE, USA  
08-03-2018 | NTSB CEN18TA314  
1 injury | Personal flight  
Pilot lost control while maneuvering and impacted terrain. The helicopter sustained substantial damage.

Bell 206  
Basin City, WA, USA  
08-07-2018 | NTSB WPR18LA214  
1 injury | Agricultural flight  
Aircraft impacted the ground during spray operations. The helicopter was destroyed by a post-crash fire.

Hughes 369  
Honolulu, HI, USA  
08-08-2018 | NTSB WPR18LA221  
4 injuries | Sight-seeing flight  
Aircraft experienced significant inflight vibrations. Pilot executed a power-on autorotation to an emergency landing at a field. The helicopter was substantially damaged.

Bell 412EP  
Nakanojo, Japan  
08-10-2018 | NTSB ANC18WA065  
9 fatalities | Type of flight unknown  
No summary provided.

Robinson R22  
Ocean City, MD, USA  
08-10-2018 | NTSB GAA18CA483  
Nonfatal | Type of flight unknown  
No summary provided.

Robinson R22  
Queenstown, South Africa  
08-15-2018 | NTSB WPR18WA225  
1 fatality | Game-capturing flight  
Aircraft impacted powerlines while in flight. Helicopter was substantially damaged.

Schweizer 300  
Kindred, ND, USA  
08-16-2018 | NTSB CEN18LA334  
1 injury | Personal flight  
Aircraft was substantially damaged during a forced landing. During cruise flight, pilot reported hearing a loud “snap,” followed by an uncommanded yaw of the helicopter. Pilot entered an autorotation that terminated with aircraft rolling over onto its side. A post-impact fire ensued and much of the helicopter was destroyed by the fire.

Hughes 369  
Granger, TX, USA  
08-21-2018 | NTSB WPR18FA232  
2 fatalities | Training flight  
During planned orientation/recurrency training flight, aircraft struck overhead power lines, impacted the ground and was subsequently destroyed by post-impact fire.

Hughes 369  
Ridgway, PA, USA  
08-22-2018 | NTSB GAA18CA506  
Non-fatal | Type of flight unknown  
No summary provided.

Robinson R22  
Corvallis, OR, USA  
08-24-2018 | NTSB GAA18CA508  
Non-fatal | Type of flight unknown  
No summary provided.

Bell 206  
Battle Mountain, NV, USA  
08-18-2018 | NTSB GAA18CA512  
3 injuries | Type of flight unknown  
No summary provided.

Eurocopter EC130  
Hilo, HI, USA  
08-19-2018 | NTSB WPR18TA239  
1 injury | Maintenance flight  
Aircraft experienced an in-flight separation of its left rear sliding door during a maintenance track and balance flight, damaging the main rotor blades. The pilot performed a precautionary landing to a grass field.

Bell 212  
Dardanelle, CA, USA  
08-25-2018 | NTSB WPR18LA242  
1 injury | External load flight  
During public aircraft operations, pilot encountered unspecified problem and subsequently descended into terrain. The aircraft sustained substantial damage.
SEPTEMBER 2018

MD Helicopter 369
Orchard Lake, MI, USA
09-03-2018 | NTSB CEN18LA365
1 injury | Personal flight
Aircraft impacted terrain during takeoff, sustaining substantial damage.

Guimbal Cabri G2
Santa Ana, CA, USA
09-03-2018 | NTSB WPR18LA252
No injuries | Training flight
Aircraft was damaged during unsuccessful practice power-recovery autorotation, rolling onto its left side.

Robinson R44
Domazlicka, Plzen, Skvnany, Czech Republic
09-05-2018 | NTSB CEN18WA376
4 fatalities | Type of flight unknown
Aircraft impacted terrain while maneuvering at low altitude.

Bell 206
Bartica, Guyana
09-10-2018 | NTSB ERA18WA248
Non-fatal | Type of flight unknown
No summary provided.

Robert L. Cooons RW1 (Exp)
Billings, MT, USA
09-12-2018 | NTSB WPR18FA260
1 fatality | Personal flight
Experimental amateur-built helicopter collided with hangar while maneuvering, fatally injuring the sole occupant.

Robinson R44
Honolulu, HI, USA
09-18-2018 | NTSB WPR18LA269
Nonfatal | Air Tour Flight
Following engine malfunction, pilot performed descent as part of precautionary landing and impacted terrain with forward speed, causing substantial damage to aircraft.

Robinson R44
Buttonville, ON, Canada
09-25-2018 | NTSB CEN18WA390
1 fatality | Type of flight unknown
Aircraft impacted terrain while diverting due to deteriorating weather conditions.

Eurocopter AS350
Ruidoso, NM, USA
09-29-2018 | NTSB GAA18CA571
Nonfatal | Type of flight unknown
No summary provided.

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Lost in Transition

Shortcuts in transition training can turn even routine operations into adventures—or tragedies.

"IF IT’S GOT WINGS, I CAN FLY IT."

The phrasing suggests that this attitude is chiefly a fixed-wing problem, but it has parallels in the rotorcraft world. True, airplanes—with their combination of dynamic stability in flight and vastly reduced range of potential landing sites—probably do more to encourage this kind of thinking.

Helicopter pilots may be more apt to recognize the different skills required to go from hovering an R22 to making pinnacle landings in a Chinook (or vice versa), but they can still underestimate the extent of training needed to move between craft of more similar size and power. Thorough transition training imparts the mastery needed to deal promptly and effectively with the unexpected.

While it may be an extreme example, the fatal crash of an Airbus AS350 B3E during an attempted dolly landing in calm weather in Carlsbad, California, shows just how inadequate transition training can severely limit a pilot’s ability to use the aircraft … and to respond to whatever emergencies might arise.

The Flight

N711BE, a 2014-model AStar with just 33 hours on the airframe, took off from Carlsbad shortly after 2:00 p.m. on November 18, 2015. At the controls was the ship’s new owner, a 65-year-old bank president who’d bought the helicopter the previous month. His 60-year-old passenger was also a helicopter pilot, but he had no AS350 experience and only about 180 hours of rotorcraft time overall.

The AStar returned to the airport a little over two hours later and was cleared to land on Runway 24. The pilot descended to the runway at midfield, turned left at Taxiway A3, and then hove-taxied along Taxiway A. The wheeled dolly from which it had departed was at the west end of the Premier Jet FBO (now Atlantic Aviation) ramp, so the pilot approached it from the east, heading directly toward the sun.

His first landing attempt came up short, with the skids roughly centered on the cart’s back edge. The helicopter teetered back until its tail skid hit the ground, then began to rock back and forth, gaining enough force to kick away the chock securing the dolly’s left front wheel. The platform spun a half turn to the right, with the helicopter following it for the first 90 degrees before spiraling upward into a hover.

The pilot then set it down—prudently, one would think—on the ground, straddling the line between the ramp and the taxiway. When questioned by the tower controller, he replied, “Yeah, they didn’t chock my cart, and I was like a skateboard out here.” The controller turned him over to ground control while the line crew resecured the dolly, this time adding chocks to a third wheel.

After taking off and climbing to about 20 feet, the pilot made three more approaches to the dolly. He broke off the first two about 5 feet up.

A witness on the ramp captured footage of the third try, which ended with the helicopter hovering for about a minute before again touching down short, with the rear half of the skids hanging off. The helicopter rocked back, forward, and then back again, striking the tail skid for a second time before pitching forward, rolling right, and briefly climbing out of sight behind a hangar. FBO security cameras recorded the aircraft spinning 180 degrees left and pitching up 45 degrees.

According to the National Transportation Safety Board (NTSB) report, “the tail rotor and vertical stabilizer assembly then struck the ground and separated, and the helicopter hit the ground left side low, bounced, and rotated another 360° before landing hard on its belly. Once on the ground, the main rotor blades continued to spin, while the helicopter started spinning on its belly, as the engine continued to operate.”

Over the next five minutes, the aircraft slid some 530 feet down the ramp, spinning at a rate of about once per second until the tail boom and vertical stabilizer broke off. At that point the helicopter rolled onto its side, shearing off the main rotor blades. The engine kept running until it was smothered by fire crews.

In-cockpit images recorded by the helicopter’s Appareo Vision 1000 flight-data monitor suggest that the pilot lost consciousness at the initial impact. His passenger remained conscious for about two more minutes but could not shut off the engine or even move the collective’s throttle control from its “FLIGHT” detent. Both deaths were attributed to multiple traumatic injuries.

The Pilot

Investigators never located the pilot’s logbooks. His last four medical applications, filed during the preceding five years, all cite identical numbers: 25,000 hours of total flight experience with 200 in the previous six months. His January 2011 medical application claimed 25,400 hours of flight time.

He held a private pilot certificate with ratings for airplane single-engine and multi-engine land, single-engine sea, instrument airplane, and rotorcraft helicopter, with a type rating in the Cessna CE-525S.
Citation. He had earned his helicopter certification in 2001, taking his checkride in a Bell 206B-3. His application for that rating cited 14,000 hours in airplanes. Before buying the AS350, he had owned a Bell 407 and “several” Citation jets.

Three instructors who’d flown with him were interviewed during the investigation. None had ever seen his logbooks, much less made any entries in them.

The fixed-wing CFI who had given him recurrent Citation training over the past six years described him as “a high time pilot with lots of turbine jet experience” who had “owned several Citation jets and helicopters in his life and operated them for many years single pilot.”

However, the accident pilot was concerned that his reaction times had begun slowing with age. Though he had spoken of regaining currency and buying another Citation, his training had been intermittent; he had never completed the full refresher course.

The CFI believed that since his wife’s death a decade before, his client had begun “taking a more cavalier attitude toward flying; he would often let the airplane get ahead of him, [and] would not be concerned.” He characterized the pilot as “a proud and successful person, with strong ego.”

During their conversations, the accident pilot had also described his discomfort with landing the AStar, particularly “on carts,” and said that he was considering selling it. He had “agreed whole-heartedly” with the suggestion that he “just put it on the ramp” if not comfortable with the dolly landings.

The two helicopter CFIs who’d flown the AS350 with him gave similar accounts. (Both were colleagues at the company from which he had bought the ship.) The company’s chief pilot described him as “relatively competent” and “good flying from A to B; once airborne,” but he had also insisted that the accident pilot complete the Airbus factory transition course before beginning formal training in the helicopter. He described their nine hours of dual as “familiarization/demo flights.”

His colleague flew with the accident pilot just once, for two hours on November 13. Much of that time was spent simulating dolly landings by using cracks in the pavement and taxi lines to simulate the right front corner of a cart. The accident pilot had heard that engaging the stability augmentation system would enable him to “land it like a pro,” but throughout two attempts the instructor saw him fighting the system’s inputs “with unsatisfactory results.” After that, they had turned the system off.

Both instructors noticed that previous shoulder surgery had left the pilot with limited mobility in his left arm. He was unable to climb up to inspect the rotor head during the preflight inspection and had to use his right arm to lift his left hand to the engine start switches. Both urged him not to fly without an instructor until he had completed systematic transition training and taken enough additional dual to become comfortable with the aircraft.

The chief pilot was “incredibly surprised” to learn of the accident, as he understood that the accident pilot would not fly the helicopter without supervision until he had taken the factory course. It turned out that he had registered for a B3 pilot transition course scheduled to begin November 2 but called to defer on October 31.

The Helicopter
During the flight with the second helicopter CFI, the pilot had mentioned his “5,000
hours” in the Bell 407 and complained that the AS350 “felt backwards.” There was, of course, a reason for this: while nearly identical in engine output, their main rotors turn in opposite directions.

Numerous images—from the Appareo flight recorder, security cameras at Carlsbad, and witnesses on the ramp—show the AStar yawing significantly (up to 150 degrees) just after liftoff, indicating that less than 11 hours in that aircraft hadn’t yet recalibrated the pilot’s deeply ingrained habits of pedal inputs. Further complicating his efforts to land on the dolly was the fact that the tips of the AStar’s skids are too far aft to be seen from the pilot’s seat, necessitating cultivation of other visual references. The 407’s skid tips are in clear view through the chin bubble.

The Takeaway
Reading this—or the NTSB report—it’s hard to understand why that first tailstrike didn’t convince the pilot that it was time to leave the helicopter on the ramp and resume training another day. Having at least come close to damaging a multimillion-dollar machine, why take any more risks?

For that matter, his decision to not only fly a machine he had admitted made him uncomfortable but to attempt the one maneuver he found most difficult is hard to fathom. As often seems to happen with financially gifted professionals flying high-end aircraft, the same traits that bolstered his business success—many of which also distinguish good professional pilots—may have made it hard to acknowledge even temporary limitations.

This pilot had both the background and innate ability to develop the needed proficiency … if he had taken transition training as seriously as his earlier aviation education. “If it’s got rotors, I can fly it” is an even more precarious attitude than the version involving wings. 🌡

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The Power of Procedure

Procedures exist so that you avoid repeating the accidents of others.

The high rate of helicopter flight-related mishaps in recent years is alarming. Yet, despite endless preaching and PowerPoint presentations, pilots continue to power perfectly good helicopters into the dirt.

Instead of telling you about why it’s important to fly safe, I’m going to ask you to focus on how to be safe. Here’s the secret: stop letting external factors influence your actions, properly weigh the risks before starting the engine(s), and most importantly—follow procedures!

It seems pilots and maintainers often fail to follow procedures, sometimes intentionally. This is referred to as procedural (intentional) noncompliance, or PiNC.

You can begin to see the severity of the problem when you consider the Boeing Commercial Airplane Group’s analysis of commercial jet airplane hull loss statistics from 1982–91. “Boeing claimed that flying pilot adherence to procedures could have prevented 50 percent of the 232 fatal hull losses in that ten-year period.” Boeing further concluded that this figure would have been higher if the nonflying pilot’s failure to comply with procedures was included.

Procedures for checking aviation weather and filing flight plans are clearly delineated in FAA regulations. Yet, according to 2016 research, weather was a cause or contributing factor in 35 percent of fatal GA accidents, of which 60 percent occurred while instrument meteorological conditions were present. How many of these mishaps could have been avoided if pilots had simply followed procedures?

In 2006, Australia’s Civil Aviation Safety Authority (CASA) went so far as to write letters to all Australian pilots about their lack of adherence to mandatory procedures. The Australian regulator stated that flight crews “may also attempt non-standard procedures because they mistakenly believe they are safer than the approved, and legally mandatory, procedures.” Ignoring procedures so that you can be safer runs counter to the common maxim that aviation regulations are written in blood—the regulations and the procedures they mandate exist precisely to prevent or avoid unsafe conditions.

This ROTOR features the debut appearance of a regular department: Recent Accidents & Incidents (see p. 60). In this issue, we list 43 rotary-wing accidents and incidents that have occurred between July 1, 2018, and September 30, 2018. Forty-three—in only three months! And that list draws mostly from the United States (although we will add coverage of other countries in the future).

In future columns, I and other writers will discuss additional ways to fly safe. But in the meantime, do yourself (and those you fly with) a favor: follow procedures!

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3. CASA warns pilots: It’s deadly to ignore procedures; 26 June 2006; CASA
The Win-Win of a CASS Program

Evaluating your maintenance performance leads to safer, more efficient operations.

As stated in 14 CFR 135.431, Part 135 operators who operate an aircraft with at least 10 passenger seats are required to set up and maintain Continuing Analysis and Surveillance (CASS) programs. The CASS program ensures the overall effectiveness of an operator’s inspection and maintenance activities by collecting data on their performance and analyzing and correcting deficiencies. It will also help operators to identify hazards and to structure control measures to minimize risks, thereby increasing the safety of their operations.

Your CASS program should contain the following elements to ensure that your maintenance activities are carried out effectively and in full regulatory compliance:

- Gather the data necessary to evaluate the performance of your maintenance activities
- Identify deficiencies and positive or negative trends
- Facilitate in making appropriate revisions and modifications when necessary.

Inputs into a CASS program generally come from two sources: performance information from aircraft and engines, and the results of a systematic audit of maintenance activities.

Performance Analysis. Data sources for this part may include inspection forms, minimum equipment list items, pilot reports, scheduled and unscheduled component removals, service difficulty reports, engine performance data, and reports from flight-data monitoring or health and usage monitoring systems.

Problems that affect or could affect airworthiness or the safety of passengers and crew must be given top priority and the root cause determined and corrected ASAP. Put a system in place so that urgent issues are reported to the appropriate levels of management in a timely manner, and make sure everyone understands when it is appropriate to use the emergency response channel for their reports.

Nonemergency items that affect safety can be sorted into those that require short-term or long-term monitoring. They will also need to be prioritized according to their severity and likelihood, and analyzed for subsequent corrective action. Problems not related to safety can be prioritized according to scope, financial impact, convenience, or accepted as part of the cost of operation with no corrective action required.

Audit Function. The audit function needs to include at least the following areas: removed component condition/evaluation and follow-up, review of the administrative and supervisory aspects of the maintenance program (both internal and external), and ensuring regulatory and policy compliance.

It has been estimated that in 65 to 70 percent of all maintenance-related incidents and accidents, failure to follow approved policies and procedures was a major contributing factor. In addition to the potential for a serious accident to occur, failure to comply with appropriate documentation frequently places the operator and maintenance personnel in a position of regulatory noncompliance and all of the associated problems that come with it.

A good audit program is one that is structured to provide a continuous audit of the maintenance system to ensure that everyone, at all levels, who is connected with the system are in compliance with:

- All applicable government regulations
- OEM policies, procedures, and maintenance instructions
- Your customers’ required or recommended policies and procedures
- Your own company’s policies and procedures
- Industry standards.

As the Part 135 operator, you are responsible for ensuring that all external suppliers and vendors also are in compliance with all applicable government regulations. This means that your outside suppliers and vendors must be included in your audit program, as you need to gather the relevant information that substantiates their compliance.

The audit program should ensure that:

- All technical data are current and readily available to the user
- All maintenance is performed in accordance with the methods, standards, and techniques specified in the appropriate technical data
- All maintenance documentation, such as inspection forms, work orders, and so on, are regularly reviewed for completeness, accuracy, and proper entries
- All airworthiness releases are properly executed by the appropriate individuals
- All carry-over/deferred maintenance items are properly handled
- The receiving department identifies and inspects parts and materials in accordance with regulations and best practices
- All shelf-life items are properly controlled
- Procedures for the calibration and control of tools and equipment are in place and being followed
- Housekeeping requirements are being met to ensure a safe working place.

While you may not be required to run a CASS program, there can be significant benefit for operators who use 14 CFR Part 135, Subpart J, Maintenance, Preventive Maintenance, and Alterations, as a template for developing their own maintenance quality assurance program.
Keeping Perishable Skills Fresh

*Proficiency is perishable. It’s up to you to keep it fresh.*

**TRAINING IN THIS INDUSTRY** is all about becoming proficient and staying proficient. Becoming proficient with an aircraft for both pilots and mechanics requires an extensive initial training course that covers all the systems, procedures, and checklists. After that, proficiency can be maintained through everyday duties and responsibilities.

What about those skills that we don’t use very often? If you have maintained your IFR currency with the minimum requirements for the year, are you ready for that moment when you realize that you are now in the clouds? If you haven’t worked on a turbine engine for five years, are you ready to do that overhaul?

Our challenge is to sustain perishable skills. These are skills that we tend to forget over time, and they can be physical, like committing to an autorotation, or cognitive, such as knowing when to commit to an autorotation.

When we don’t repeat skills very often, we don’t experience the repetition necessary to build muscle memory or cognitive pathways. This is what happens when you learn how to program your new phone. A few months go by, and then you realize you can’t remember how to use some functions. You forgot these perishable skills because you hadn’t done them in some time.

Perishable skills for pilots include instrument procedures, autorotations, or any abnormal or emergency procedure. For a maintenance technician, a perishable skill is any procedure or troubleshooting task not performed on a regular basis.

The most effective way to stay proficient in these perishable skills is training and repetition. Your skills—even the perishable ones—will stay the longest when you learn them to the point of mastery, rather than competency. And to maintain your perishable skills, you need recurrent training: periodically returning to the subject to study or practice more.

Recurrent training should be viewed by the pilot or mechanic as an opportunity to fine-tune skills that are weak or easily forgotten. This requires some internal honest assessment by them to recognize the areas where their skills need to be reinforced. They should consider the training to be an asset instead of a chore.

In some cases, our regulators require additional training to keep our perishable skills current. Regulatory agencies require landings, night flight, and instrument currency on a scheduled basis to maintain proficiency. Mechanics with inspection authorization must provide proof of recently completed tasks or go through biannual training to maintain that authorization. To maintain their instructor status, flight instructors must also prove they have kept current.

Proficiency can also be supported by reading articles and accident reports that discuss the indications and solutions for various events. The knowledge for these skills can be strengthened by studying manuals, doing computer-based training modules, or “armchair flying.”

The Blue Angels use armchair flying to regularly review their entire flight routine. The team sits in a conference room, talking through every step and maneuver in real time. This is an excellent method for reviewing normal flight procedures.

Recognizing indications of abnormal or emergency situations, however, may require more of a visual approach. The use of simulators and real-life scenarios in pilot recurrent training has proven to be quite effective.

The International Helicopter Safety Team has lots of resources that can help pilots and maintenance technicians with issues that we don’t see in our normal operations. Keep current on these resources and share them with your colleagues.

The Internet community also offers a host of resources that will help you to stay current on best practices, including how-to videos. Try it for yourself. Ask your Internet browser a question on a procedure or potential situation in an aircraft and see what you find. Almost everything has a video or internet reference.

You can find information on start procedures, walk-around inspections, emergency indications, and how to track rotor blades. However, do verify that your Internet source for this information is solid. Check details for accuracy, and make sure the article or video references the manufacturer’s published procedures.

As a helicopter professional, please keep in mind that some of your skills are perishable. You can maintain your proficiency by recognizing this fact and continually addressing the challenge. The key to maintaining proficiency in perishable skills is to take recurrent training seriously.
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Let’s Be Honest About Safety

HELICOPTERS ARE WONDERFUL. They can rise vertically, transition forward and back, move left and right, and rotate around the vertical axis without changing their location. What enormous flexibility! This fabulous capability makes helicopters powerful tools for doing so many things.

This great agility, along with helicopters’ ability to operate away from airports and their cleared paths for approach and departure, comes with very apparent risks. That’s why discussions about safety are particularly important to the helicopter community. Sadly, much of this discussion hasn’t been as helpful or insightful as it could be—and in some cases, it can actually be counterproductive.

Much of the unhelpful talk has come from well-intentioned folks with lots of responsibility on the subject. After a very public accident, people like the secretary of transportation or the FAA administrator will often reassure the public with soothing comments like “Safety is our No. 1 priority” or “There can be no compromise with safety.”

The assertions are meant to be comforting, and they are. They assure the public of the firm resolve by people in power to do better. The problem is they aren’t—and can’t be—true. You can’t start an engine without compromising safety. If safety were our No. 1 priority, we’d never move an aircraft. It would always be safer to stay put.

Clearly, flying is, in itself, proof that moving the aircraft ranks ahead of safety. The problem is that these little intellectual dishonesties tend to end thoughtful discussion on the subject.

A while back, an FAA administrator declared that there can only be one level of safety. It is a comforting thought that, no matter what aircraft you fly in, you are equally safe. But once again, it can’t be true. A multi-engine helicopter with ultrareliable turbine engines will always be more dependable and capable, or “safer,” than a single-engine piston training helicopter.

When noted Australian thought leader and avid helicopter pilot Dick Smith (with two around-the-world helicopter flights under his belt) was chairman of the Australian Civil Aviation Safety Authority, he steered people away from disingenuous talk about safety. He shocked them instead by calling for “affordable safety.”

Smith’s point was that when safety becomes too expensive, there can be a net reduction in safety. When excessively expensive safety measures are mandated, say for transportation to offshore oil rigs, the cost of flying goes up. This could drive people to take the less expensive and less safe marine option instead, resulting in a net increase in risk to passengers.

Moreover, safety advice can even generate resistance. It can be preachy, with an off-putting air of smugness and superiority. When commenting on an accident, people commonly suggest that the pilot did not exercise proper judgment or sound aeronautical decision-making. This comes across as vague, demeaning criticism that contributes little positive guidance.

So what is the alternative?

We need to change our safety vocabulary. In nearly every case, it is more insightful and helpful to talk about how we can best manage the risks of helicopter aviation.

The concept of risk management suggests a proactive habit of identifying hazards, assessing their severity and likelihood, and mitigating those that pose real dangers. For helicopters in particular, it is time to adopt clear, straightforward, and honest discussion about managing risks.

A wonderful example is provided by HAI President and CEO Matt Zuccaro. His simple, clear recommendation for lowering the risk of a flight in deteriorating conditions? “Land the damn helicopter!” ☝️
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