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UAS Approved for Aerial Spray Missions
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About the cover: Some Black Hawks are flying under new colors as the U.S. Army sells off UH-60A models — in part to earn the cash to buy UH-60Ms. Writer Douglas Nelms looks at the auction process and what you can get for $650,000, the average winning bid.

ROTOR® magazine invites its readers to submit articles about the international helicopter community for publication. The publisher reserves the right of final approval based on subject matter and space availability. Letters to the editor are also welcome. For information about submissions, please contact Gina Kvitkovich, director of publications and media, at 703-683-4646 or rotor@rotor.org.
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As a helicopter pilot, I consider myself lucky to be part of this incredible industry. How many people get to see the world from 1,000 feet? — a view that we sometimes take for granted. We need to stop and smell the roses more, to take a moment to really appreciate what we do for a living.

Yes, piloting is work — sometimes demanding and intense work — but we need to cherish that work and have gratitude for what we are doing. Looking back on some of the flying and various projects I have been part of in my career, there are moments that will stay with me for the rest of my life.

I remember one day parked at base camp on the Kaho'olawe project in Hawaii, where the flying was intense, to say the least. Kaho'olawe is an island 8 miles off the cost of Maui that the U.S Navy used as target practice from World War II to the mid-nineties. I was part of a project to clean up bomb remnants from the island. Some of the ordnance was still live, and we had to blow them up in place.

So there I was ... hungry, fatigued, and in a bad mood. It was barely noon, and I had already been flying almost six hours. On this project, that was the norm.

We flew about eight hours almost every single day, and duty hours were a solid 14 hours per day. On top of that, the flying was demanding — I had a long line below me 80 percent of the time, moving equipment from one part of the island to another.

I was working on the project with my buddy Pete. It was because of him and his always-positive attitude that I stayed sane. As we were standing there, an S-61 pilot came up to us and said, “Remember this day, guys. There will never be another one like it. One day you will appreciate this project.”

I thought to myself, This guy is nuts. Appreciate this?

But he was right. Looking back, I now appreciate the intensity of the work and all that I learned about flying and myself. I especially value the camaraderie shared by all of us on the project team.

Most of us have someone in our life with whom we share our work. Often, these people may never set foot inside our office or hangar, but they know intimately about our struggles and achievements there. For some, it is a family member or friend. The person who has been there for me is my wife, Snow.

Our industry does not always recognize that in order for us to go to work and be successful in our careers, there is someone in our life that we leave behind. They put up with us coming home, tired, grumpy, and complaining, and they are always there for us, worrying about us, encouraging us. They never get the recognition for what they do.

Sometimes they don’t even get a call to tell them when we’ll be coming home late.

Once I had to take a check ride for the U.S. Department of the Interior Office of Aviation Services for an upcoming fire season. Snow, my then-girlfriend, decided she wanted to come with me.

As I left the hotel that morning for my check ride, my last words to her were, “I will be right back.” When the check ride was completed and I was about to pull out from the parking lot, one of the supervisors came running out to my car. The helitack crew had gotten a call to go fight a fire, and I was the only pilot there.

I slept in the aircraft that night and was on the fire for two full days. This was before cellphones were common, and I was not able to communicate anything to my future wife about my whereabouts.

Yes, she was still at the hotel, patiently waiting for me when I got back. I sometimes can’t believe that she still married me.

Like me, many of you have an amazing spouse or partner who deals gracefully with your shortcomings. They still worry about us but at least with today’s technology, we can call to let them know when we will be late.

We should better appreciate what they do for us. After all, they are also part of our incredible industry. Without them, we would not be where we are today.

I consider myself lucky to be part of this industry but even luckier to be able to share my experiences from it.

Torbjorn “TC” Corell is the current chairman of HAI’s Board of Directors and chief pilot for Southern California Edison in Chino, California.
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Let’s Support the GA Community

Let’s talk about GA. In some magazines, that might lead to an article on the state of Georgia. But in aviation, GA stands for general aviation, and that’s what I want to focus on.

First, let’s make sure we understand the topic. Just what is general aviation?

The average person will tell you that general aviation is all aviation that is not flown for commercial purposes or to produce revenue for services provided. This definition narrows the GA world to include only flights conducted for personal or recreational purposes.

But ask Merriam-Webster, and you’ll get a more inclusive definition: “The operation of civilian aircraft not under the control of a common carrier.”

It turns out that general aviation is defined mostly by what it is not: aviation operations by a “common carrier,” or an airline. In other words, GA is everything that flies for commercial, private/recreational, or business purposes — except the airlines.

This definition opens up a lot of territory. Gliders, corporate business jets, hot-air balloons, crop dusters, powered parachutes, helicopters — these are all GA aircraft. Their missions run the gamut as well, ranging from the urgent, such as air ambulance, to a delightful afternoon of recreational flying.

HAI’s operator members fall into three categories: commercial operators, government service operators, and general aviation. Members in the last category are those who operate helicopters for private use or as a business aid.

Unfortunately, the variety of the GA segment means that it sometimes takes a back seat to other areas of aviation. We do our industry a disservice by not giving the proper attention to general aviation, whether that describes a business operator, someone who flies on personal business, or the recreational, just-for-fun aviator.

The majority of airports and heliports do not have scheduled airline service at their locations. Instead, they service the needs of general aviation. According to a 2012 FAA report, this described 88 percent of all U.S. airports.

GA also leads in aircraft sales. On average, more helicopters are sold to the business and private/recreational segment of general aviation than to commercial operators.

Most pilots are more than likely involved in business and private/recreational operations, not commercial flying. This highlights another reason that the private/recreational segment of our industry is so important: it is a gateway for the majority of future pilots and aviation maintenance technicians. A flourishing GA segment is part of the solution to the shortage of skilled aviation professionals.

We need the support of the GA community in other ways too. As we in helicopter aviation fight for our access to airspace, for increased support for new and existing heliport facilities, and for the prevention of overburdensome regulations and legislation, the support of the recreational/private community is essential to meeting our goals.

HAI is dedicated to addressing the concerns and needs of our GA members. We partner with the FAA Safety Team outreach program, where we support and sponsor safety seminars for general aviation pilots throughout the United States.

We also conduct helicopter-specific flight instructor refresher courses (FIRC) at our annual event, HAI HELI-EXPO®, which will be held in Dallas, Texas, March 6–9, 2017 (exhibits open March 7–9). HAI members can also take the King Schools online FIRC at a discount; visit rotor.org/FIRC for details.

In our work to eliminate all accidents in the helicopter industry, HAI and the International Helicopter Safety Team have discovered that the highest occurrence of accidents takes place in the GA segments associated with recreational, personal flying, and flight training. The U.S. Helicopter Safety Team is planning to address this sobering statistic with focused teams preparing to reach out to these GA segments. Safety has to be the first priority for all of us in aviation.

HAI also conducts an outreach program for helicopter flight schools and other training facilities with a focus on safety and career development. Participating in our Fly Neighborly noise abatement campaign is another way in which GA pilots can take steps to ensure that they will be able to fly another day.

However, we at HAI can always do a better job of engaging with our GA members. With that in mind, I respectfully ask those in the GA community to let me know how we can better serve your needs. We stand ready to do that and truly want to hear from you.

That’s my story and I am sticking to it. Let me know what you think at tailrotor@aol.com.

As always, fly safe — fly neighborly.

Best Regards,

Matt Zuccaro is president and CEO of HAI.
Be a Vertical Aviation Leader

Who We Serve

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Five Ways to Become a Better Pilot

In aviation safety, we constantly work to increase awareness of safety issues among pilots. This is not an easy task. We are all aviation professionals and, frankly, they, you, and I have heard it all before. The truth is that each of us has the knowledge necessary to fly safely. So why don’t we?

When I read the accident reports, the chain of circumstances that builds until it finally sends an aircraft down is sometimes unbelievable. Members of the armed forces are prepared to die for their country; it seems that many pilots are prepared to die for their right to not follow standard operating procedures.

Safety is always a work in progress, and we need to recognize that one of the principal duties of a professional pilot is to manage the risks associated with aviation. Whether that’s written down in your official job description or not, the FAA has made you the final authority on safety for a flight.

It’s the pilot who can say yes or no to flying that aircraft from point A to point B; it is the pilot who can prevent most accident chains from going forward.

Here are five things that you can do to become a better, safer pilot.

**Improve Piloting Skill**

Flying is a skill. As new pilots, we were excited to just keep the helicopter in the air. Then we practiced until we were masters of the machine. Now that we have the skill necessary to fly our missions, we should continue our professional development by working on advanced piloting skills, including situational awareness, aeronautical decision-making, and professionalism.

Some of these skills can be refined outside of the cockpit. Utilize simulators to sharpen your aeronautical decision-making. Practice situational awareness while driving a car or walking on the street. Strive every day to do the right thing, even when no one is looking. Keep these skills sharp, and they will be easier to draw on when you fly.

**Practice Risk Management**

Early in our careers, we measured our ability by being able to complete the missions we were asked to do. Later, we recognized that our real value to the organization is to set appropriate limits on what we can accomplish.

Learning to say no is difficult, but effective communication is one of the marks of a professional aviator. As pilots in command, it is our responsibility to manage the expectations of our passengers and management so that we do not allow them to put us in situations that have unacceptable levels of risk.

**Seek Out Continuing Education**

One study showed that people who participated in the FAA WINGS Program had an accident rate much lower than the pilot population at large. Another study looked at members of aircraft type clubs, such as the Bonanza Club or the Cirrus Club. It turns out they also had the same low accident rate.

The conclusion? Participation in continuing education and networking with your peers is an effective tool to reduce your chances of being in an accident. FAASTeam safety seminars, HFI Rotor Safety Challenge sessions — these are proven ways to lower your accident rate.

**Learn the New Technology**

Today, we are seeing a dramatic increase in new aviation technologies, such as glass cockpits, advanced navigation displays, and synthetic vision. But after the wow factor fades, many of us have not taken the next step — to learn the new technology inside and out. We need to know how to use them properly.

Whenever we use a new piece of equipment, we should know the proper procedures for its use, the instructions for maintaining its continuing airworthiness (ICA), and the methods for recognizing and dealing with failure modes.

Without sufficient training in their use, these tools that are meant to improve operational safety and efficiency can end up doing the opposite.

**Mentor and Be Mentored**

The aviation safety community has recognized that what will improve the accident rate more than anything else is to create a positive safety culture, where management and employees share a belief in the importance of safety and work together to create a zero-accident flight operation.

The best way to create that culture is to mentor each other and create a positive attitude around continuously improving workplace safety. No matter where you are in the food chain — new guy or veteran pilot — step forward and be an advocate for safety and professionalism.

Our collective wisdom and embrace of a positive safety attitude will make all of us better pilots and, hopefully, reduce the helicopter accident rate.

Stan Rose is HAI’s director of safety outreach.
2017 HFI Rotor Safety Challenge

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60+ Free Safety Education Events for Registered HAI HELI-EXPO Attendees and Exhibitors

View 2017 schedule, session descriptions, and more at rotor.org/takeethechallenge

Take the HFI Rotor Safety Challenge!
Attend at least six Rotor Safety Challenge events and receive a certificate of recognition. FAA WINGS and AMT program credits are also available.
Whether you are a student considering a career in the helicopter industry or you work at a flight or airframe and powerplant (A&P) school to train the next generation of helicopter industry professionals, membership in HAI can help you accomplish your mission.

Time and again, our work on our members’ behalf has paid off. For example, HAI has been working to oppose legislation that would restrict flight-training benefits available to U.S. veterans. If enacted, the bill would threaten the ability of veterans to join the aviation industry (especially the vertical-lift sector) and might cause one of the best pools of potential new pilots to dry up. HAI has been successful in blocking the bill — so far.

HAI is also working with one of its Affiliate Members, the Aviation Technical Education Council, and the FAA in an ongoing endeavor to modernize and reorganize the certification of aviation maintenance technicians. Students should receive up-to-date foundational training that matches the changing needs of our industry.

HAI staff are urging that the A&P certification process be revamped to be more flexible and to make the transition to performance-based standards that will be appropriate now and in the future as the industry evolves.

**Member Benefits for Schools and Students**

As helicopter operators, flight training schools are eligible to become Regular Members of HAI. A&P schools are eligible to become Associate Members, the membership category for industry vendors and suppliers.

As HAI members, flight training and A&P schools and their services will be listed in the online membership directory and in HAI Mobile, the go-to app for the international helicopter community. HAI members also receive discounts on attending or exhibiting at HAI HELI-EXPO®, the world’s largest helicopter trade show and exposition, as well as on advertising in HAI media.

Flight schools that want to “fly to a higher standard” can join the association to use the HAI-APS standards for flight training to help reduce accident rates and improve their safety cultures. The HAI Accreditation Program of Safety is only open to HAI members.

In addition, all staff of Regular and Associate Members are eligible to receive the benefits of membership, including discounts on HAI Professional Education courses and on the King Schools online helicopter flight instructor refresher course (FIRC).

**Networking, Education, and Career Development at HAI HELI-EXPO**

At HAI HELI-EXPO 2017, which will be held in Dallas, Texas, March 6–9 (exhibits open March 7–9), everyone connected to the helicopter industry will have plenty to see and do, both on and off of the exhibit floor.

Students should consider attending the HFI Career Roundtable and the HFI Helicopter Industry Career Fair. Both events are free and will be held on Tuesday, March 7. The roundtable offers students and anyone interested in rotorcraft careers the opportunity to meet with industry professionals; the career fair connects job seekers and companies in the helicopter industry.

Attending the rest of HAI HELI-EXPO 2017 requires a registration fee, but it will be worth it to tour 700+ exhibits and see 60+ aircraft on display. Registered attendees also can take in some of the 63 Rotor Safety Challenge safety education sessions, 14 HAI committee...
meetings, or the many industry meetings or forums.

HAI HELI-EXPO offers so many opportunities for networking and professional development — come to Dallas and see for yourself. One- or two-day passes are available, and students receive a significant discount on registration.

Join HAI and tap into its wealth of resources and information. To learn more or to join, please visit rotor.org/join.

Join HAI and Prepare for Your Aviation Career

Student membership in HAI is free for the first three years. After that, the annual dues are an affordable $35 per year until you complete your course. Any full- or part-time student enrolled in a flight training school, A&P school, college, or university is eligible to apply. To learn more about HAI membership or to join, please visit rotor.org/join.

HAI’s sister organization, Helicopter Foundation International (HFI), offers 19 scholarships annually for aspiring pilots and maintenance technicians. Becoming an active member of HAI is one way for students to demonstrate their interest in and commitment to a rotorcraft career. Applications for the 2017 scholarships are due by November 30; you can learn more and apply online at rotor.org/scholarships.

Join HAI and tap into its wealth of resources and information. It’s also a great place to start building lifelong professional relationships. If you have questions regarding HAI membership or if we can be of assistance, please contact me or any member of the HAI staff at 703-683-4646 or member@rotor.org. 

Louise Martin is HAI’s director of membership.

HAI is expanding its team of dedicated professionals. We are recruiting for several full-time positions located in our Alexandria, VA, headquarters. Our positions range from aviation specific to administrative. Come join the HAI team and work in the city named one of the top 100 places to live.

A list of current openings and position descriptions is available online at rotor.org/employment. Please email resumes@rotor.org with additional questions. HAI is an Equal Opportunity Employer.
Where Does a Pilot’s Responsibility for Maintenance Begin and End?

Most people in aviation know the Federal Aviation Regulations (FARs) give the pilot in command final authority for operation of an aircraft. They also know the pilot in command is directly responsible for the safe conduct of the flight. So even if you have never heard of “the miracle on the Hudson” or have not seen the movie Sully, you know the pilot is in charge and responsible.

What about responsibility for what happens on the ground before an aircraft ever takes off, like maintenance? How can the pilot in command possibly be responsible for maintenance he did not perform, may not have seen performed, or cannot confirm was performed properly?

Think about the number of people involved in maintaining an aircraft, and you begin to see the scope of the problem.

Overlapping federal regulations and conflicting state laws delegate maintenance responsibility among numerous people. However, the pilot in command is still responsible for conducting a thorough preflight inspection before each flight and ensuring that the aircraft is airworthy and safe for flight.

Here are a few suggestions to help you fulfill those responsibilities.

Making Sense of Regulations, Industry Standards, and What a Jury May Think

The starting point for looking at what a pilot should do is usually the FARs, and there is plenty of guidance to work with — 14 CFR 91.3(a), 91.7(a), 91.403(a), and 91.405(a) are a few of the regulations that make the pilot responsible, even down to ensuring that proper maintenance logbook entries are made.

Then there are obligations imposed by company procedures, preflight checklists, and industry practices. Ideally, these procedures give specific guidance about how a pilot should ensure that maintenance requirements have been met.

In the legal world, we combine regulations and normally accepted practices to determine what a “reasonably prudent pilot,” or in the commercial world, what a “very cautious, competent, and prudent pilot” would do under the same or similar circumstances. Although the circumstances determine exactly what a pilot should or shouldn’t do in any particular situation, a general common-sense standard applies.

“Reasonableness” Is Best Guide

Fortunately, reasonableness still controls, so when there is a dispute about a pilot’s maintenance responsibilities, the outcome in most court cases makes sense. For example, in a noncommercial situation, a pilot or owner can hire a licensed mechanic to perform maintenance and reasonably rely on that mechanic to perform the work properly.

Of course, the pilot may still be responsible if she knew or should have known of a defect that was left uncorrected. For example, if a pilot should have caught a maintenance problem during the preflight and did not, responsibility for a bad outcome is normally shared between the person who caused the problem and the person who failed to catch it — with the exact distribution of fault based on the relative culpability of the actors.

In the commercial context, even if an operator delegates maintenance work to someone else, the operator normally retains responsibility for

Pilots may need to pay closer attention to what maintenance providers are doing — even if it seems like getting into their business.
that work. This is consistent with commercial operators being held to a higher standard of care: passengers are entrusting their safety to that operator, with little or no opportunity to evaluate who is performing the maintenance.

In a recent case where a maintenance provider admitted to not performing critical parts of a required inspection, the maintenance company’s defense lawyer then blamed the aircraft owner/pilot for not ensuring the maintenance provider had done what he had been hired to do. Such a defense borders on ridiculous and the case settled before trial, but it does point out that owners and pilots may need to pay closer attention to what maintenance providers are doing — even if it seems like getting into their business.

The Pilot Is Required to Ensure Proper Maintenance Logbook Entries

Under the FARs, no person, including the pilot, may operate an aircraft without complying with the manufacturer’s mandatory replacement times and inspections or other approved inspection program. This means pilots are required to know the inspection criteria for their aircraft — and to ensure that those criteria are being complied with.

14 CFR 91.405(b) also specifically requires the pilot to “ensure that maintenance personnel make appropriate entries in the aircraft maintenance records indicating the aircraft has been approved for return to service.” While most pilots understand that a preflight includes a review of maintenance paperwork, some pilots may not know they are responsible for making sure the logbook entries are done correctly.

A Simple Suggestion

Checklists are proven tools to sustain your focus through the mundane and to prepare you to handle the dramatic or unexpected.

When it comes to verifying maintenance, if you do not already have a checklist, make one to ensure you are confirming component times and inspection intervals. Confirm that any special maintenance requirements have been satisfied, as required by 14 CFR 91.405. To ensure you comply with 14 CFR 91.405, learn what maintenance record entries are necessary for a return to service and add those to your checklist.

Do not be shy about examining maintenance records for the aircraft you are about to fly. No one has a more personal interest in the condition of the aircraft than the person flying it.

Jon Kettles, “Your Aviation Lawyer,” is an aerospace engineer and ex-military helicopter and fixed-wing pilot with fixed- and rotary-wing airline transport pilot and certificated flight instructor – instrument ratings who has been practicing aviation law for more than 20 years. Jon can be reached at jon@kettleslaw.com.
Obstructive Sleep Apnea

If you’ve had an FAA medical exam within the past few years, you likely have noticed your aviation medical examiner (AME) now asking you whether you snore loudly at night or whether anyone has ever noticed you stop breathing while you’re asleep.

These questions are aimed at assessing your risk for obstructive sleep apnea (OSA), a condition that can disrupt sleep and cause daytime fatigue or subtle reductions in cognitive performance, and increase risk for heart attack, stroke, and other serious conditions.

Some of you may recall that a few years back, the FAA was going to mandate that all pilots with morbid obesity (body mass index or BMI greater than 40) undergo a sleep study. This was in part due to a recommendation from the National Transportation Safety Board but also because more than 90 percent of morbidly obese people have sleep apnea.

Many pilot groups, including HAI, objected to the planned mandate, so with stakeholder input, the FAA put in place a process that allows your AME to screen you for sleep apnea in whatever way they deem best. You may be asked some obvious questions first (for example, have you been diagnosed with sleep apnea or treated for it), but then each AME follows his or her own process for determining if you are at high risk for OSA. There is no automatic deferral of your application based on BMI alone.

Let’s start with the condition itself. Obstructive sleep apnea is typically caused by excessive tissue around the throat, which leads to intermittent obstruction of the airway during sleep. This closing of the throat causes loud snoring and periods of apnea, or absence of breath.

Obesity usually causes the excessive tissue build-up around the neck, but up to 20 percent of those with sleep apnea are not obese. Sometimes it’s just your anatomy.

The periods of apnea send your body into overdrive as it is deprived of oxygen. There is a surge of adrenaline, increased heart rate and blood pressure, and a bed partner may notice you gasping for breath.

People with moderate to severe OSA may wake up hundreds of times each night. What’s interesting, however, is that typically you don’t fully wake up while this is occurring. When you wake up the next morning, you may think that you slept well. However, your body and brain are deprived of rest, causing the performance drops discussed earlier.

Obstructive sleep apnea is diagnosed in several ways. Often a patient might be spurred to action by a bed partner fed up with loud snoring.
or a doctor’s suspicions based on weight or chronic medical conditions. If medical professionals suspect sleep apnea, screening is the next step, which starts with a sleep study. This is usually done at a medical facility, although the FAA also accepts a home version.

In a laboratory sleep study, technicians will hook you up to monitors and watch you sleep through the night, looking for signs of sleep apnea, such as loud snoring, apneas, and low blood-oxygen levels. A sleep study can also be performed at home, where you sleep hooked up to a portable monitor.

If the sleep specialists diagnose sleep apnea, they usually recommend treatment with either a continuous positive airway pressure (CPAP) machine or a dental device that adjusts your jaw to open up your airway, both of which are approved by the FAA to treat the condition. A CPAP machine uses a mask or prongs that are worn while sleeping to supply a constant flow of air under pressure, so your airway never collapses and remains open.

Let me give you an example of how someone can have sleep apnea and not know it. A very obese patient of mine a few years back recounted how he had been diagnosed with OSA.

His wife had noticed that he snored loudly and at times stopped breathing. He was referred to a sleep specialist and told he should undergo a sleep study — which sure enough yielded a diagnosis of severe obstructive sleep apnea.

When he returned to try out a CPAP, he took one look at the mask and machine and protested that he would never be able to sleep using the apparatus. As they placed the mask on his face, he was about to tell them to forget about it.

The next thing he knew, he was waking up eight hours later after “the best night’s sleep of my life.” This is a great example of why obstructive sleep apnea is so insidious. Without realizing it, many sufferers have adjusted to a life of fatigue and oxygen deprivation. Once their OSA is treated, they experience truly restful sleep.

Remember that OSA is a disqualifying condition. Once you are diagnosed, be sure to self-ground in accordance with 14 CFR 61.53. You can get back to flying pretty quickly once your obstructive sleep apnea is treated, but make sure you work with an AME who is experienced with getting pilots through the process.

Dr. Charles H. Mathers is an FAA senior aviation medical examiner and is board certified in Aerospace Medicine and Internal Medicine. He serves as medical director for the Aerospace Medicine Center at the University of Texas Medical Branch in Galveston, Texas, which specializes in the evaluation of pilots with complicated health conditions, fitness for duty evaluations, and monitoring of pilots in the HIMS program. He has been a private pilot since 2004.

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Civilian helicopter operators in the United States can now buy one of the world’s safest helicopters at a good price from the U.S. Army as it upgrades its UH-60A and -L Black Hawk fleet to the -M model — and the army gets to keep the money.

Under the three-year-old Black Hawk Exchange and Sales Team (BEST) Program, Black Hawks are initially offered to federal and state agencies and then back to Sikorsky, the manufacturer, with the remainder auctioned to the public by the General Services Administration (GSA). The money from aircraft sales goes to fund the purchase of new UH-60Ms by the army.

Gerald Dwyer, director of the Special Projects Office of the Utility Helicopter Project Management Office, says the government has sold 136 UH-60As to 19 customers, allowing the Army “to buy five UH-60Ms with no appropriated dollars.”

UH-60A and -L Models
From 2014 to 2025, 400 to 800 UH-60A and -L models have been approved for disposal. However, Dwyer says, the -L model is not yet being sold. “We’re still working our way down though the Alpha fleet.”

The biggest differences between the two models, Dwyer says, is the capacity — the L model is a 9,000-lb external-load aircraft, while the A model can lift 8,000-lb loads — and the gear box. “The -L model has the improved durability gearbox, the main gearbox that increases the TBO [time between overhaul] on that item, and has other improvements that make the aircraft better. But the main thing is the gear box which gives you the higher TBO.”

However, Dwyer adds, “there haven’t been a lot of people on the civil side rushing to turn an -A into an -L.” The conversion from an -A to an -L is extremely expensive. If the transmission in an -A model needs to be replaced, Dwyer says that...
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most operators simply buy another Alpha or buy a transmission from a parts source.

“The -L models will be coming out eventually,” he says, noting that the BEST Program is scheduled to operate through 2025. “The price [for the -L models] will be whatever people are willing to pay.”

Operators should also consider their engine options, says Dwyer. “Any General Electric T700 engine can go into the UH-60. The Cadillac of the fleet is the Alpha model with the 701D, making it the lightest UH-60 model with the biggest engine. That is the aircraft of choice for hot and high operations.”

Pros and Cons

There are fiscal and physical advantages, as well as disadvantages, for civilians in buying these ex-army helicopters. While the winning bids can range from $200,000 for a nonflying aircraft and $3.5 million or more for a flyable one, the average is around $650,000, Dwyer says. Throw in $1 million or so for conversion, and the buyer has a well-proven utility twin turbine with an 8,000-lb payload for around $2 million (this figure will vary widely depending on the selected aircraft and conversion options).

Disadvantages include a 160 gallon-per-hour fuel burn and an estimated major periodic maintenance cost of just over $600 per flight hour, according to Conklin & de Decker Associates, based on figures for the S-70, the civil version of the UH-60 (see table 1).

Another advantage: the UH-60 is one of the safest helicopters available on the civilian market today. The aircraft was built to be used in combat, replacing the Vietnam-era UH-1 Huey, and it has served in virtually every combat action since then.

“The aircraft on the civil market today just don’t have the crashworthiness and redundancies offered by the UH-60,” says Bart Brainerd, president of Firehawk Helicopters, based in Leesburg, Florida. One of the first UH-60 customers, Firehawk purchased the first of its five UH-60s under the BEST Program in 2014 to expand its fleet of four S-70s.

The Auction Process

The seven-day auction process for a UH-60 starts when a new UH-60M is about to come off the Sikorsky production line. An army unit then pulls one of its UH-60As off the books, demilitarizes it by removing all military-oriented equipment, and flies it to an Alabama consolidation site where the contractor Science & Engineering Services ensures the aircraft is in shape to be auctioned.

GSA alerts the civil industry to the auction through sources such as the Aircraft Dealer Network and other channels. Dwyer said he also contacts potential bidders by calling or visiting them, as well as attending trade shows.

Usually 20 or so bidders start the process by making a $100,000 bid deposit to GSA online, entitling them to inspect the aircraft. According to Dwyer, it’s like eBay — all the bids are submitted in the last five minutes.

While the average winning bid is now around $650,000 for a good aircraft with acceptable remaining component times, the lowest bids tend to be for unflyable aircraft, which have gone for as low as $200,000.

Even unflyable helicopters, though, can go for higher prices, if what’s keeping them grounded is simply a bad part, such as a fuel pump, that can easily be replaced. Winning bidders are responsible for obtaining an approved end-user certificate (EUC) and then for the remainder of the purchase price, for which they receive a bill of sale and the paperwork to register the aircraft with the FAA.

New owners must get a type certificate (TC) for the aircraft, a roughly five-month process, but they get all the records and manuals showing that the aircraft has been well maintained by the army. According to Dwyer, this is important for the FAA. “It knows the new owner will fly and maintain the aircraft in the same way, which simplifies the TC process.”

Losing bidders can leave their $100,000 deposit in place for a future bid or get it back.

Travis Storro, chief operating officer of Timberline Helicopters, an Idaho company that flies three BEST program UH-60s, says current availability of UH-60As for the civil market is excellent, “as long as you are a U.S. citizen and willing to wait about three months for the EUC to get approved before you pick up your aircraft from the GSA auction site.”

The Cost to Convert

Converting the UH-60 to civilian operating requirements runs about $1 million to $1.5 million, “depending on the aircraft and the final configuration specs,” Storro says. “The conversion can be fairly labor-intensive if you want to have a quality product when it’s completed.” Timberland converts its UH-60s itself, other than the main and tail rotors, which are sent to HeliBlade in Anderson, California.

A standard conversion, which takes around six months, requires disassembling the aircraft, including removing all panels, doors, windows, interior, floor panels, and flight controls. Also removed are excess military wiring and systems not necessary for civilian operations, such as head-up display, combat identification gear, missile warning systems, and flares and chaff dispensers, all of which amounts to about 150 to 200 lbs on average.

Finally, all exterior and interior paint

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<tr>
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<tr>
<td>Lubricants</td>
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<td>Maintenance labor2</td>
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<tr>
<td>Parts airframe/engineering/avionics3</td>
</tr>
<tr>
<td>Engine restoration4</td>
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<tr>
<td>Major periodic maintenance</td>
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<tr>
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<tr>
<td>Total variable costs</td>
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<tr>
<td>Cost per nautical mile</td>
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<td>Average speed</td>
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Note: type of operation: utility; size of operation: 1–2 aircraft
1 Fuel cost: $3.99; gals/hr blk fuel time +15%: 162
2 Maintenance labor cost per hour: $95; maintenance hours/flight hours: 4:77
3 Includes engine parts cost: CT7-2C engine model, 1998 aircraft model year
4 Overhaul cost source data provided by CDAR Research

Source: Conklin & de Decker Associates, Inc.
is stripped to facilitate inspection of the fuselage.

The aircraft must then be reassembled, prepped and painted, and civilian audio system and radios installed, along with any other desired avionics and mission-specific equipment. After flight-testing and all required inspections, the UH-60 receives its type certificate as a restricted-category civilian aircraft.

**Restricted Category Certification**

One drawback of buying a UH-60A is that the aircraft is certified under a Part 91 restricted certification, meaning it cannot be used to carry passengers or cargo for hire. Because U.S. military aircraft are certified by military authorities and not the FAA, they face additional restrictions when being recertified for use in civilian aviation. No one has done a full Part 135 standard type certificate for the UH-60A yet, Storro says.

In addition, while army-operated Black Hawks are instrument rated, aircraft that have been converted for civilian use do not retain that certification. For one, the army removes the GPS and transponder before the sale. In addition, many of the aircraft sold have inoperative VOR (VHF omnidirectional range) and ADF (automatic direction finder) systems. The buyer would have to install and certify new navigation systems to meet instrument flight rules (IFR) equipage requirements.

Restricted-category aircraft cannot be operated over densely populated areas, in congested airways, or near busy airports where passenger operations are conducted. This pretty much rules out flying instrument approaches or performing instrument rules. The restricted category only allows day-and-night visual flight rules and prohibits flight into known icing.

“For a restricted-category utility helicopter, it’s pretty hard to say that IFR flights are necessary to accomplish the work activity associated with the special purposes of agricultural aircraft operations, forest and wildlife conservation, and external load operations. I doubt the FAA would buy that argument,” Storro says.

According to Sikorsky, company representatives have met with most of the civil operators who have purchased the UH-60A to determine their needs and is currently assessing ways “to help this new UH-60A community successfully operate their aircraft.”

**Third-Party Sales**

The BEST Program also provides UH-60As to third-party companies, such as Skycore Aviation and AGD Systems, which purchase the aircraft through GSA and then offer them to domestic and international operators.

These aircraft can be resold as foreign military sales or direct commercial sales. However, sales of UH-60s to foreign military organizations must meet International Traffic in Arms Regulations (ITAR), which adds cost, time, and difficulty to the transaction. AGD Systems of Boca Raton, Florida, has more than 30 UH-60A Black Hawks for conversion and sale; all international sales will be conducted as foreign military sales.

A third-party company can also resell the aircraft to either foreign or domestic civilian customers through direct commercial sales, which uses a faster, more streamlined approach to purchasing the aircraft, according to Chris Burgess, president of Skycore Aviation, based in Chesapeake, Virginia. Skycore provides helicopters, personnel, and training to its customers, 90 percent of whom are outside the United States.

Burgess noted that the foreign market is brand-new: “military” Black Hawks sold to foreign governments are actually civilian S-70s sold through direct commercial sale. “Nobody has sold a [UH-60] Black Hawk overseas yet. Because of the BEST Program and the divesture of these programs, we decided to get into the new market.”

Converting the Black Hawks for conversion and sale; all international sales will be conducted as foreign military sales.
foreign customers is not difficult, says Burgess. “The issue is the certification that the aircraft will be operating under. If it is shipped overseas, it is operated under [local] authority.”

Skycore is offering three UH-60As under its Black Hawk 360 Solutions program, which includes phased maintenance inspections (both PMI-1 and PMI-2) and updated calendar and hourly inspections. The aircraft are “ready to go for a customer who can then decide what type of avionics and what type of configuration they want. We also have access to additional aircraft in California,” says Burgess.

**UH-60 vs. UH-1**
The newly available UH-60As and the well-established civilianized Hueys tend to be complementary, according to Timberline’s Storro, whose company flies both the UH-1 and the UH-60. The UH-1 lifts around 3,000 lbs, depending on fuel requirements, “and is perfectly suited to the missions it has performed for years, such as firefighting, logging, and smaller power-line projects.

“But it doesn’t have the performance to do the larger scale construction projects where everything is bigger,” he says. “The Black Hawk fits perfectly into the scale because it handles the 3,000- to 8,000-lb lift range.”

He also notes that with the optional upgrade to the T700-GE-701D/CC engine for improved hot/high performance, “the Black Hawk can be equipped to outperform anything in its weight class.”

Although the smaller, less complex Huey would seem more economical to operate, its time out of production is becoming an issue. Although more than 16,000 were built, Bell ceased production nearly 30 years ago in 1987.

BEST Program head Dwyer notes that for the UH-1, “the days of having large numbers of spares is over.” Some components are now only available from a single source. According to Dwyer, this “has thrown the cost of operating a UH-1 up so much that it often exceeds the cost of flying a Black Hawk.”

The UH-60 is going to be “the wave of the future in utility operations,” Storro says. “The Black Hawk’s lift capacity, reliability, and cost of operation makes it unbeatable. Coupled with the fact that no manufacturer has built a utility helicopter that fits our mission profile in the last 20 years means the aircraft has no real competitor.”

—Douglas Nelms is a former U.S. Army helicopter pilot and current freelance aviation writer based in Haymarket, Virginia. He recently retired from full-time aviation journalism after a career stretching back 40 years, including serving as senior editor of Air Transport World and managing editor of Rotor & Wing. A single/multi-engine instrument-rated pilot in both fixed- and rotary-wing aircraft, Nelms now restricts his active flying to writing pilot reports on new helicopters coming down the line.

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Yamaha Motor Corp., U.S.A., in May became the first company cleared by the FAA to use an unmanned aircraft system (UAS, or drone) to aerially treat crops in the United States. The development puts that firm first in what could be a valuable market.

Brittany Pederson, a viticulturist (grape specialist) whose company is using the UAS to conduct spray missions in California vineyards, lauded the Yamaha vehicle’s performance. “I think the Yamaha RMAX has great potential in the wine industry,” she says.

UAS spraying offers advantages over conventional methods. For example, the UAS flies lower and slowly, which makes the spraying more effective, and workers experience less exposure to dangerous chemicals.

It can also reach remote areas that are difficult to reach for a worker spraying on foot.

The UAS flies lower and slowly, which makes the spraying more effective, and workers experience less exposure to dangerous chemicals.

First Used in Wineries
RMAX use in the United States initially involved application of a fungicide for control of powdery mildew, a common disease affecting grapes and other crops, in Napa County, California. The Yamaha model used, the RMAX, weighs about 140 pounds empty and can carry about 60 pounds of liquid or granular application, usually flying at up to 12 mph. See figure 1 for a complete list of RMAX specifications.

According to Brad Anderson, a market development manager at Yamaha’s Unmanned Systems Division, Yamaha performed about 10 applications in Napa during the 2016 growing season, which goes from March through July. “At this point we have not had any significant activity on any other crops in the U.S. but this is an area we will soon expand and explore,” he says.

“Our plan is to be a full-scale spray services provider for the 2017 season providing our services to interested growers and vineyard management companies in the Napa/Sonoma region.” The company is targeting hillside vineyards now being sprayed by people with backpack sprayers.

“At this time we are still in the process of finalizing our pricing for next season, but the pricing will be dependent upon the terrain,” he says.
For Lease Only
Yamaha does not plan to sell the RMAX. Instead, it plans to lease the aircraft to organizations that are licensed and qualified to operate the units.

The reason, Anderson says, is that Yamaha wants to “control the end use of the products and ensure they are being used properly by the right people.”

RMAX pilots must have a sport-rated pilot license; in addition, to spray in California they need a commercial pilot’s license. The pilots also are required to go through Yamaha training on the RMAX. That three-week course includes one week of theory, bookwork, and simulation and two weeks of flights under an instructor’s supervision.

Another reason for Yamaha’s lease program, says Anderson, is that the company wants to “ensure the proper maintenance is completed and done correctly. Our units have a maintenance schedule and we want to ensure that the schedule is followed.”

Successful Initial Trial
Pederson, of the Napa, California, vineyard development and management company Silverado Farming, says that the RMAX showed itself during the spraying season to be “comparable to conventional spray operations in terms of effectiveness in preventative disease spray applications.” In-house trials yielded similar results, she says, “with trace-to-no disease presence in a difficult mildew year.”

She terms the spray coverage lower than is customary but says “distribution of the spray particles seemed to be even throughout the vine, even in the height of the season when canopies are over 5 feet tall.”

The RMAX’s ability to evenly distribute a sprayed product is important, according to Pederson. “Its ability to effectively spray narrow-spaced vineyard rows has a great advantage over the conventional equipment. Backpack spraying, which is a difficult, time-consuming, and potentially hazardous task, can sometimes deliver variable coverage throughout the plant.

“The RMAX delivers a probable solution to one of our largest challenges in terms of vineyard spraying,” she adds. “Consistent coverage is important to take full advantage of the fungicide’s protection.”

The equipment offers a service comparable to conventional crop-protection application equipment, Pederson says, although “each vineyard and operation is quite unique, and therefore operating costs may vary site to site.”

FAA Exemption for Expanded UAS Mission
Yamaha was able to begin the program under a May 2015 Section 333 FAA exemption. The federal exemption to provide commercial agricultural-related services was the first for a UAS and allowed Yamaha to begin spraying on U.S. farms, subject to state and
local approval. The exemption was amended in December 2015. According to Anderson, in addition to meeting all the conditions and limitations listed in its Section 333 exemption, Yamaha must meet the requirements for agricultural aerial spraying in any state where it wants to operate. In California, it had to register as a pest-control business with the state and its pilots had to take examinations to be certified. The company must also register in counties where it wants to operate.

In granting Yamaha the exemption, the FAA cited the safety record of the RMAX, which has been used for two decades in Japan for agricultural work. Yamaha began developing the UAS in 1983 as a result of a push by Japanese officials. In light of that country’s aging farm workforce, the government was looking for labor-saving agriculture devices.

To date, the RMAX has flown more than 2 million flight hours treating crops in Japan alone. It has also been approved for use in Australia and South Korea.

In its filings with the FAA, Yamaha noted that the RMAX had treated more than 2.4 million acres of agricultural land in Japan alone, and that over a 20-year period, “there have been no injuries due to problems with the aircraft in Japan, Australia or South Korea.”

In the limited cases of a problem with the aircraft, according to the exemption, “the RMAX has either been safely landed and shut down
by the pilot or fallen to the ground without personal injury. There have been no collisions with other aircraft.”

No longer in production, the RMAX fleet in Japan will gradually be replaced with a newer model, the Yamaha FAZER. That model is lighter and can carry 50 percent more in payload. According to Anderson, the company only has a U.S. exemption for the RMAX, but it hopes to be able to operate the FAZER in the United States eventually.

The Yamaha program “is important because it demonstrates the importance of UAS beyond imaging applications. It has also been important as the first UAS over 55 pounds approved by the FAA for commercial use,” says Phillip Finnegan, director of corporate analysis at the Teal Group, an aviation analysis group.

Sign of Things to Come?
As far as the future goes, Yamaha’s Anderson says most of the company’s U.S. research and activity has focused on spraying wine grapes. “However, as that now becomes commercial, we plan to focus on other crops and nonagricultural opportunities.”

The success of the RMAX could be the harbinger of big things to come in U.S. agriculture for UAS manufacturers. Farming in the United States is worth $183 billion, and about one-ninth of world agriculture land is in the United States.

According to the Teal Group’s 2016 World Civil Unmanned Aerial Systems Market Profile and Forecast, precision agriculture — both spraying and imaging — promises to be a substantial long-term UAS market and, in the long run, the largest commercial one. For the moment, spraying, where the RMAX has 85 percent of the UAS market, is the more widely used agricultural application.

“In many ways,” the report says, “agriculture is an ideal area” for UAS operations, in part because it takes place away from population centers and most other air traffic. “Operating areas are low, flat, rural areas in which risks to aircraft and populated spaces are quite limited.”

While UAS performing aerial spray missions is new in the United States, that is not the case elsewhere in the world. There are now 2,500 RMAX vehicles flying worldwide, spraying more than 2.4 million acres a year, including rice, wheat, soybeans, and vegetables, the firm says.

According to Finnegan, Yamaha is the first company to enter the U.S. market, although others can be expected to get involved. DPI UAV Systems in Pennsylvania “appears to be interested in the spraying market and shows a UAS that can be used for spraying on its website,” he says.

In addition, Finnegan says the Chinese firm DJI “has introduced a smaller system in China and Korea although plans with regard to the United States are not clear.”

However, the Teal report also cautions that the unmanned spraying market has limitations: “Applications that work in Japan and the Asia-Pacific region will not necessarily work in the very different agricultural conditions of the United States.”

In the United States, according to the report, most spraying is done using Air Tractor fixed-wing aircraft, which are more economical for large fields. “Still,” the report says, “there will be niche applications in Europe and the United States for high value agricultural production such as wine, almonds, strawberries, blueberries and onions.”

Steve Hirsch, who is working with HAI’s communications staff, is a longtime journalist with broad experience in covering international business and developing countries.
The staff here at HAI continues to lean forward on a number of fronts in support of efforts important to the rotary-wing community. However, you and other members of that community may not be aware of our work regarding a relatively new area of aviation: unmanned aircraft systems (UAS).

HAI staff continue to engage in this important and burgeoning aviation sector with a clear focus on the safe and effective introduction of these aircraft into the National Airspace System (NAS). A secondary goal is to promote and assist with the implementation of this technology into the helicopter community. A number of helicopter operators have already recognized the value of UAS to their customers and are working to employ them in their daily operations.

Evolution of Technology and Perception
If you think about it, it’s remarkable that the general view toward unmanned systems has changed so drastically over just the past few years. Even five years ago, much of the dialogue around UAS focused on the frailty of the systems and their operational limitations. Many considered them disposable toys, incapable of any meaningful contribution and ill supported by existing technology.

Many of those arguments may have been true back then, but a great deal has changed as the technology has matured. Yes, some UAS are still frail and limited in function. However, does the UAS aviation segment have the potential to make substantial contributions to business and society? Today, the undisputed answer is yes. In many cases, apprehension has been pushed aside by a realization that UAS capabilities have a very real value to the customer.

HAI Forms UAS Committee
In recognition of the fact that UAS are here to stay, HAI recently established an Unmanned Aircraft Systems Committee. Chartered in the summer of 2015, the committee membership consists of a balance of leaders drawn from manufacturers, operators, academics, and government agency advisors.

The committee’s charge is to support and represent HAI members through the development of programs, policies, and guidance to facilitate the safe integration of UAS into the NAS. This is especially important for our members, as UAS and helicopters both spend more time at low altitudes than other types of aircraft.

Another key objective of the committee is to assist HAI members in identifying potential opportunities related to unmanned systems use and to promote positive, cooperative communication between manned and unmanned users in their shared airspace. The committee’s first public meeting, held in Louisville at HAI HELI-EXPO 2016, drew quite a large crowd — indicative of the industry’s interest in, and perhaps curiosity about, unmanned aircraft.

Research and Rulemaking Efforts
HAI has also worked to build bridges between government and industry by taking part in a variety of research and rulemaking efforts. In the fall of 2015, HAI staff participated in the FAA’s Extended Visual Line of Sight (EVLOS) Pathfinder Work Group held in Washington, D.C.

The group was tasked with evaluating risks and developing corresponding mitigation recommendations to support the study of UAS operations in the EVLOS environment. In this operating scenario, the remote pilot in command relies on one or more remote observers to keep the UAS in sight at all times, to relay flight information via radio, and to assist the pilot in maintaining...
safe separation from other aircraft. The week-long event produced the recommendations necessary for the FAA to move forward with a study of EVLOS operations.

HAI also had an important presence on recent regulatory advisory initiatives. In November 2015, HAI President and CEO Matt Zuccaro was invited to participate as a member of the highly publicized FAA UAS Registration Task Force. Drawn from the full scope of stakeholders with equity in UAS integration, the task force was assigned the challenging duty of developing recommendations regarding which UAS should be registered, as well as providing input on an efficient registration process. The results of this task force were subsequently used by the FAA as the foundation for the registration requirements.

In February 2016, HAI participated in the FAA’s Micro-UAS Rulemaking Advisory Committee. The group provided recommendations to the FAA related to the operation of these small aircraft over “nonparticipants” — those not actually involved in operating the UAS.

Recommendations from the group were presented to the FAA to assist with the development of the final Part 107 rule governing small UAS operations, which was released in June. Although that rule did not include the work of this committee, the FAA has stated that the Micro-UAS Committee’s report remains under consideration and will be reflected in future updates to the rule.

Zuccaro Named to Drone Advisory Committee
Most recently, Matt Zuccaro was appointed to the newly formed FAA Drone Advisory Committee (DAC). Established as a broad-based, long-term advisory committee, the DAC will provide advice to the FAA on a wide range of UAS-related issues.

Reportedly, more than 400 individuals applied for membership on this 35-person committee. The FAA’s inclusion of HAI on this committee is indicative of the important relationship between the helicopter and UAS communities in terms of shared airspace and, to some extent, shared missions.

The Big Picture
HAI’s aim to this point has been to build and strengthen relationships among regulating agencies, key segments of the UAS industry, and our members. There’s been a great deal of work done to this point, and there remains a great deal to go. As always, the safety of the NAS remains first and foremost in all we do.

As we continue this work, I think there are two recurring concerns that need to be mentioned.

One of them relates to the perceived slow speed at which the regulatory structure is being put in place to support UAS in the NAS. I get it. The drone community is excited about the potential of this new technology.

However, I think we need to keep
the big picture in perspective. From my vantage point, I see the FAA taking very seriously its duty to ensure the safety of those operating in the NAS. The most complex airspace in the world, the NAS sees, on average, more than 100,000 flights each day. According to the FAA, roughly 5,000 aircraft are in flight above the United States at any given moment.

Now let’s add to the NAS hundreds of thousands of new aircraft, with new operating methodologies. Don’t forget, you’re also adding in hundreds of thousands of operators, many of whom are brand-new to aviation. The FAA is tasked with creating regulations, standards, policies, processes, and procedures for technology that sometimes has not been tested to aviation standards and, in some cases, does not yet exist.

Let’s face it, for 100-plus years, nearly all our focus has been on manned aviation. The entire system is built around that model. It’s going to take time to recast some longstanding molds to create an effective regulatory system that achieves the integration — not segregation — of manned and unmanned aircraft in the same airspace.

The other concern relates to the current state of UAS technology. There’s no doubt that the capability is rapidly advancing, but it still has a way to go. Work continues on the technology that will enable UAS to meet the many requirements necessary to operate in the existing NAS.

As just one example, see/sense-and-avoid technology is an absolute must if UAS operations will be routinely conducted beyond life of sight. This work is critical and the results must be fully tested and validated to the very high standards of aviation safety before being approved for use.

I’ve had the opportunity to work with some innovative people from the drone community, and there are some great ideas being developed to ensure safety within the airspace. However, I’ve also encountered a few who are willing to cut corners or rush implementation in order to support their agendas. I’ve met some folks who “just don’t understand” why they can’t fly their drones beyond line of sight right now.

The bottom line is that trading long-term safety for near-term sales or to meet a perceived need to rush UAS into the NAS should be unacceptable to everyone. The good thing, based on my observations, is that the overwhelming majority of stakeholders from both manned and unmanned aviation adhere to this focus on safety.

HAI will continue to lean forward with our industry and government partners to support the integration of UAS. With a unified focus on safety, education, mature technology, and professionalism, we’ll be able to achieve the long-term goal of getting these new aircraft safely integrated into the system.

Chris Martino is HAI’s vice president of flight operations.
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As a regional partner of the International Helicopter Safety Team (IHST), the U.S. Helicopter Safety Team (USHST) is a team of government and industry professionals working to address safety issues in the U.S. civilian helicopter industry. The goal: to better understand the causes of accidents so it can develop best practices for improving overall safety in the helicopter industry.

Recently, the USHST met to develop its strategy for the next several years. The result, USHST 2.0, focuses the team’s attention on several areas and on a new goal.

Increased Focus on Fatal Accidents
Moving forward, the USHST is focusing its attention on reducing fatal accidents. Of course, every accident is worth preventing, and the USHST is dedicated to working toward a civil helicopter community with zero accidents. However, by prioritizing accidents where lives were lost, the USHST is concentrating its prevention efforts on those accidents with the worst outcomes.

By focusing on fatalities, the USHST is also aligning with the proven methodologies used by the Commercial Aviation Safety Team (CAST) and General Aviation Joint Steering Committee (GAJSC). The work of CAST has been credited with reducing the fatality accident rate of U.S. commercial aviation by 83 percent over the last 10 years — an enviable record, and one that the USHST would love to beat.

Setting the Target
The USHST is setting as a target a 20 percent reduction in fatal helicopter accidents by 2020. As a benchmark, the USHST is using a fatal accident rate of 0.76 per 100,000 flight hours, which is the average rate for the prior five years that have reliable data derived from the FAA General Aviation Survey. The goal is to reduce fatal helicopter accidents to 0.61 per 100,000 flight hours.

Can we do it? Actually, through 2016, total accidents have decreased significantly since the IHST was formed. The helicopter accident rate has been cut by nearly 50 percent compared to 10 years ago. Additionally, compared to a decade ago, fatal helicopter accidents are down close to 40 percent and the fatal accident rate continues to trend down.

Government and industry efforts to improve safety have been effective. USHST 2.0 was created to direct additional safety efforts at targeted areas that will have the greatest chance of delivering significant improvements.

The USHST plans to consistently measure fatal accident rate progress while focusing its attention on action items that will keep the accident trends moving in the downward direction. The team will use several “mile markers” as guides to measure progress over the next several years (see figure 1). As of the end of September 2016, the fatal accident rate was 0.55. With several more months of flying to go, we are currently below the end-of-year target of 0.69.

In It to Win It
In 2016, the USHST completed a comprehensive analysis of U.S. fatal helicopter accidents occurring from 2009 to 2013. Half of the 104 fatal accidents analyzed stemmed from just three types of accidents:

- Loss of control
- Unintended flight into instrument meteorological conditions (IIMC)
- Low-altitude operations.

The USHST decided to focus much of its safety efforts on these three types of accidents. Again, this is not to say that other types of accidents are not worth preventing. However, the USHST has decided to go after these top offenders first. After all, these three types of accidents were responsible for more than 100 deaths, more than the next eight types of accidents combined.

Currently, the USHST is forming several focus groups to develop safety recommendations aimed at mitigating these types of fatal accidents. By
focusing on these three areas, the USHST plans to make significant progress toward achieving its goal of reducing fatal helicopter accidents by 20 percent by 2020.

**Reaching Out**

One reason for the USHST’s data-driven approach is that it enables the team to drive resources toward the areas of the industry that are experiencing the highest number of accidents. Of the accidents analyzed, the segments experiencing the most fatal accidents include:

- Personal/private
- Helicopter air ambulance
- Commercial helicopter operations
- Aerial application.

The USHST has already begun to strengthen its outreach efforts to these helicopter industry segments. Special USHST outreach groups will identify points of contact within these industry segments, involve key people in seminars and industry meetings, and attend conventions and safety gatherings relevant to these identified sectors. Their goal is to engage with the targeted segment and increase safety awareness, as well as to learn from that community any issues that are impeding improvement of that segment’s safety record.

**Focused Attention**

In order to reduce fatal helicopter accidents by 20 percent by 2020, the USHST is focusing its immediate attention on some of the following areas:

- Enhance outreach efforts to specific helicopter industry segments that will deliver targeted advice relevant to that segment’s unique operations, with special emphasis on personal/private flying, commercial operations, aerial agricultural application, and emergency medical services.
- Concentrate its efforts in the safety areas involving personal protection equipment, aircraft certification standards, aeronautical decision-making, and safety risk management.
- Enhance instrument proficiency in helicopter pilots while stressing the importance of conservative aeronautical decision-making, personal minimums, meaningful preflight inspections, and adequate flight planning.

**Double Check**

As a result of its accident analyses, the USHST has realized that ineffective use of checklists and disregard for following standard operating procedures (SOPs) has directly contributed to a significant spike in fatal helicopter accidents. Many helicopter pilots believe SOPs exist only for those flying large helicopters. Wrong! Every pilot should develop and implement SOPs for all flight operations, regardless of the type of helicopter flown.

Many pilots allow the habit of using a checklist to fade over time. This is unfortunate. Even if you fly the same helicopter every day, using an approved checklist consistently is smart because complacency kills. A properly executed checklist is a resource that improves safety during all phases of flights.

The USHST has also determined that pilots with limited experience in a make and model of aircraft should follow a strict regimen of using checklists. Never assume you know any helicopter like the back of your hand. Take the extra minutes to do things right and by the book. The USHST promises you’ll never regret investing a
little extra time checking your aircraft to ensure all systems are a go.

Planning for Change
Proper preflight planning and good mental preparation pays huge dividends for helicopter pilots, especially when it comes to handling unexpected weather and mechanical issues. Well thought-out tasks prepared for on the ground often yield positive results when decisively executed in flight.

Pilots are encouraged to take immediate action should they encounter unexpected weather. If the weather starts getting crummy, there’s a high probability it will only get worse before things get better.

One resource available to help pilots in deteriorating weather conditions is called a “trigger point.” According to this philosophy, when pilots find themselves in deteriorating conditions that require them to reduce airspeed by a predetermined amount in relationship to normal cruise speed or to reduce altitude, they have reached a trigger point.

The very act of reaching a trigger point means a pilot should consider abandoning his or her original flight plan. The pilot’s next decision is choosing how to break the accident chain: whether to land, change direction, or continue the flight under IFR (instrument flight rules) conditions. An example is a National EMS Pilots Association campaign, which advises pilots: “Down by 30? Turn. Land. Go IFR. But do not continue."

HAI’s Land & LIVE campaign is another example. Pilots who are experiencing degraded flight conditions for any reason — fuel, illness, weather, mechanical problems — are encouraged to get their helicopters safely on the ground as quickly as possible. When the flight is not going well, “land the damn helicopter” is HAI President and CEO Matt Zuccaro’s sound advice.

Weather or Not
The USHST is attacking weather-related accidents from another angle as well: increasing instrument proficiency in helicopter pilots, whether or not they are flying IFR or VFR (visual flight rules).

The notion of “use it or lose it” is certainly true when it comes to maintaining instrument proficiency. Because helicopters are predominantly operated in VFR conditions and as most helicopters are not even IFR certified, instrument flight skills can get rusty quickly.

On average, it takes only 178 seconds — less than 3 minutes — for non-instrument-rated airplane pilots to lose control of their aircraft after inadvertently flying into instrument meteorological conditions. Because helicopters are inherently less stable and often less equipped, one could easily assume that it takes less time for equally qualified helicopter pilots to lose control of their helicopters in similar conditions.

Certainly, IIMC is one of the top three leading causes of accidents. Drawing from the statistics, more than two-thirds of all weather-related helicopter accidents result in at least one fatality, a rate three times as high compared to all other general aviation accidents. So IIMC is not only a leading cause of accidents, those accidents also tend to involve loss of life.

The USHST wants to remind helicopter pilots that they have options for escaping IIMC: climb, descend, land, or reverse course. Descent is often considered most risky, as it involves flying closer to the ground in poor visual conditions. Climbing, reversing course, or making a precautionary landing are likely the safest options if the pilot or aircraft is not instrument certified or cannot commit to instrument flight.

Regardless of technique, maintaining positive aircraft control should be the pilot’s highest priority. Pilots who remain calm and make subtle input changes during these hair-raising situations are more likely to maintain positive control compared to those who do not.

If you are already instrument rated, you should on a regular basis maximize your flight time under simulated instrument conditions with a qualified instructor. If not already instrument rated, make the investment. Instrument training enhances aeronautical decision-making and will vastly improve piloting skills — an investment well worth the time and money.

Bottom line: be prepared for those days when perfect weather conditions suddenly disappear. Invest in your skills and understand what your options are when flying in instrument conditions. And remember, seconds truly count when trying to escape IIMC.

Taking Action
The USHST has also discovered through its analysis that a lack of adequate preflight planning can lead to hair-raising experiences. Pilots who approach flying using a defensive mentality often experience greater satisfaction in knowing they have thought through various scenarios beforehand and haven’t left much to chance.

Join the Fight
To strengthen its purpose of reducing helicopter accidents, the USHST is calling for more industry experts to join its efforts. Best practices and safety recommendations are only as good as those who help to implement them in the field.

For information on how you can join the USHST for the purpose of saving lives by reducing fatal helicopter accidents, please contact me via email (steven.sparks@faa.gov). We encourage you to join our team — the stakes are much too high for you to miss out.
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Congratulations! You now have all the freedom you wanted back when you were wearing a uniform. The bad news is that you now have all that freedom. It’s up to you to form new habits that will enable you to successfully navigate a civilian aviation career.

You are leaving a system that tells you where to be, at what time, and in what uniform, and moving to one that relies more on personal responsibility. No longer will you be told what socks to wear or when to get your medical. It is now all on you.

Making the transition from the military to the civilian environment is quite a change, and it will require more of you than remembering not to salute your boss. Here are a few tips to surviving your first year as a civilian pilot.

Build Your Brand
The most important skill to surviving your first year? Smile and be pleasant. Your go-to response should be “I'd love to and I’ve got the time.” Help out whenever and wherever possible; no task is too small nor is any task beneath you.

The person you help can be anyone you meet — you will be surprised what administrative personnel, maintenance technicians, and visitors will remember (and possibly pass on to your boss). Above all, be polite. Remember, they may not remember what you said or did, but they will never forget how you made them feel. Be known for your smile and a friendly, positive, helpful attitude.

My friend Ryan talks about the importance of the other CRM — customer relationship management. “Business and interaction among customers and fellow coworkers is about building and maintaining relationships.”

This is accomplished, in part, by building your personal brand. In marketing, a brand is the promise the company makes to the consumer. Say “Mercedes” and people think of luxury and safety. Apple’s brand is well-designed, technically innovative consumer products.

So if your brand is to be the friendly, helpful new pilot, how do you build that? You create that perception through your work ethic, your personality, and your professionalism. Think about the messages you are sending. Is your body language positive, your language and tone professional, your attitude friendly and helpful? If not, why not?

Job 1: Learning
As much as possible, for the first 60 to 90 days, watch everything and comment on nothing. That old saying “keep your mouth shut and your eyes and ears wide open” works here. Observe how others do things and the flow of the operation. Do not attempt something without fully understanding what is expected of you and what your boss or manager would consider to be a successful outcome.

Spend this time trying to absorb
the company’s “tribal knowledge” — the information not in the standard operating procedures or policy manual. Sometimes the most important things to know are not written down.

Look at your work mates and see who is successful and who is not, and why. Observe their actions and the consequences so you can emulate the positive and avoid the negative. Seek out a mentor with whom you can consult to learn the environment, politics, and etiquette of your business. Ask questions; you’re the new guy, it’s allowed.

During the first year, don’t do someone else’s job unless they specifically ask for your help. Of course, if you have safety concerns, you should speak up. But keep your improvement ideas to yourself. Let people get to know you and feel comfortable with you before you start telling everyone there is a better way. Also, believe it or not, after three months on the job, you still have a lot to learn. Your colleagues may see your helpful comments as threatening or arrogant.

Finally, in this high-tech world, you have the opportunity to embarrass yourself not just with your local colleagues but also with fellow employees around the world. One push of the “Reply All” button will send a searing barb about the boss to the entire western division of the company instead of to your friend across the aisle. Pay attention to details. This also applies to text messages, especially work group messages. And don’t even get me started on your Facebook/Twitter/Snapchat posts.

Remember your brand: you are that positive, friendly, helpful new hire. A big part of successful branding is to consistently deliver on your brand promise — branding that promises one thing and delivers another is seen as inconsistent or, worse, dishonest.

Football coach Nick Saban calls this the Process: “Don’t worry about the scoreboard, don’t worry about winning, just focus on doing your job at the highest level, every single day, and the wins will come.” You don’t have to be a sports fan to understand what he is saying. Begin your new job as someone focused on learning how to do the job that you were hired to do, every day, the best that you can.

No One Trains Like the Military
In most cases, after being hired you will attend some sort of training. For many of us, this will be an aircraft qualification course. This may be your first experience with civilian training, and there is a world of difference between civilian and military training.

I recently talked about this with my good friend Michael, who was a military trainer and who also worked for one of the largest civilian training organizations in the world. “The military likes you to learn things verbatim, to be exact, and wants you to be able to build the aircraft from memory,” he says. “Civilian training is more about the need-to-know approach, ‘what can I do about it from

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“Civilian training is more about the need-to-know approach, ‘what can I do about it from the cockpit.’ They are more concerned with you getting the gist of it. It’s the ‘green is good, red is bad’ approach.”

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may require additional review by your aviation medical examiner or the FAA.

If staying current on your medical certificate slips your mind and you are ramp-checked by the FAA or — God forbid — in an accident, your company is liable and could lose its license to operate, meaning that flight department can be shut down. Flying without an active medical could also invalidate your company’s insurance coverage. Being involved in an accident under these circumstances could, again, lead to the end of the flight program or even the company. Good luck finding a job after that.

**Sound Like a Professional**

Think about being a true professional in everything you do. One example is your radio procedures and calls. If you have picked up or sometimes use nonstandard terminology or phraseology in your communication, lose it.

In the United States, particularly in the visual flight rules environment where a majority of helicopter flying is done, nonstandard terminology is often tolerated. This is less true in the instrument flight rules environment.

If you get an overseas position or if you are in the dual-rated club and get to fly internationally, nonstandard communication often confuses controllers, ties up airtime, and ultimately makes you look like you don’t know what you are doing. There is a section in the Aeronautical Information Manual that talks about standard radio procedures. If you practice them now, you might just look like you know what you’re doing.

Speaking of language, lose the military jargon. Not everyone understands it, and you run the risk of coming across as arrogant or as someone who isn’t comfortable in the civilian environment.

**The Good Kind of Recognition**

We work in a mobile profession, and much of our work takes place out of the office, away from the boss. It’s easy for your efforts to not be directly recognized, so learn to wave your own flag and take credit for your efforts.

This does not mean that you should be telling your boss everything you do. One CEO told one of his VPs, “I want to see the back of your head, not your face.” In other words, don’t tell me what you do, show me what you do. But during department meetings, annual reviews, or other occasions, be prepared to report on your contributions to the organization.

If you make a mistake, apologize and move on. As Colin Powell once said, “Bad news isn’t wine, it doesn’t improve with age.” Tell your supervisor your mistake and take your lumps; he or she will respect you more for doing so.

However, on the other side of the coin, never take the blame just because you are the new guy. Politely, but firmly, stand up for yourself.

Along those same lines, never, I mean never, surprise your boss. Whether it’s good news or bad, if she needs to know, tell her. Do all in your power to keep her from being
surprised by others, too. No boss appreciates looking unengaged or out of the loop when someone tells him news he should have heard from his subordinates.

Don’t Forget the Big Picture
Many times we get upset about things at work that affects our personal life. The flight schedule seems to top that list. But if you look at the big picture, you’ll see that as a pilot, yours is a support role. You were hired to support the activities your company does to make a profit. Your personal life doesn’t always fit into that equation.

If you’re honest, there is a certain amount of give-and-take with flight schedules. You may only recall the negative — when work kept you from a family outing or dinner with friends. Try to remember the times it provided you with the flexibility or the means to attend those occasions too. Remember your branding: be someone who gives more than you take.

Finally, don’t always look for kudos for doing your job. Many employers feel your paycheck is kudos enough.

Some of what we’ve covered may seem pretty basic:
- Maintain a cheerful, helpful attitude
- Dress, talk, and act like a professional
- Take responsibility
- Learn what your boss wants from you and try to give it to him every day.

But if you don’t get these fundamentals right, you aren’t going to impress anyone with your piloting skills. When choosing which pilot to hire, companies will pick the capable one who also knows how to be a good team member — every time. Do your job to the best of your ability and try to be that go-to employee in your organization.

Consider your first year as a civilian pilot to be an extended interview. Any good boss has the pulse of her organization and knows whom she can depend on. Make it your goal to be on that list — and good luck!

Marc Stanley served for 26 years in the U.S. Army, first as a helicopter maintenance technician and then as a pilot. He is now a civilian, flying corporate missions. Marc was recently elected to the HAI Board of Directors and is also a presenter at HAI’s Military to Civilian Transition Workshop, which will be next held in Dallas during HAI HELI-EXPO 2017.
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Discussions about safety management systems (SMS) often include reassuring statements such as, “You probably have many of these SMS components in place already.” For the most part, this is true. Standard operating procedures usually require SMS fixtures such as a parts inventory and tool control or incident reports.

So if you already have some SMS elements in place, how will a formal SMS program make a difference in your operational safety? It is those missing pieces of SMS that are usually the key elements in taking all of those parts and making a functional, efficient, and effective safety system.

Consider a hangar floor full of various aircraft parts. Individually, they function perfectly as designed. You may even have an engine together and running on a test stand. But it is not until they all are put together and turned into a flyable aircraft that those parts deliver the services you purchased them for.

A modern SMS takes a traditional safety program and creates a system that enables those separate pieces to deliver measurable reductions in risk.

Measure Results and Modify as Necessary
One critical piece to the safety puzzle that most traditional programs are missing is safety assurance. Is all of the time and money you spend on safety working? How do you know? Too often, a safety measure is simply put in place and assumed to be working. We can do better — and to be effective in our efforts to improve safety, we have to do more.

This series of Rotor articles was designed to help operators effectively implement SMS in the real world.

Our first article (Summer 2015, p. 58) introduced a simple SMS model (figure 1). That article discussed how hazard reporting and data collection feeds the SMS engine.

In the second article (Winter 2016, p. 88), we looked at how we analyze risks to determine the severity and likelihood of each risk, with the goal of focusing our efforts on hazards that pose the most risk to our operations.

The third article (Summer 2016, p. 62) covered the art of designing ways to control and mitigate risks.

Now, in the fourth and final article of the series, we will look at the next step in the SMS process: risk assurance. This is where we measure the results of our risk controls: Were they effective in reducing risk? Do they need to be adjusted? Let’s look at how you can use risk assurance to ensure that your safety program is working.
SMS in Action

Let’s say we have determined that bird strikes are a hazard at our operation. The first step in responding to that hazardous condition is to assess the level of risk it presents.

Remember the matrix you used for your risk assessment? Hopefully it had both colors and numbers such as the sample in figure 2 from the IHST SMS Toolkit. It is not important if the red section is paired with higher or lower numbers — we just need a way to distinguish the low-risk hazards from the higher risk ones. In our matrix, a Category 1 hazard presents the highest risk to our operation, and a Category 20 presents the lowest risk. The numerical risk value is based on both the likelihood of a hazard leading to an incident and the likely severity of the resulting incident or accident.

Our safety committee evaluates the likelihood of a bird strike and determines that they are probable. In addition, the committee believes that a bird strike could create a critical-level accident. The resulting score: bird strikes represent a Category 5 risk.

In other words, the safety committee has determined that a bird strike is likely to occur, and when it does, it is likely to result in an accident that will result in serious damage and/or injury. Sounds like some risk control is required in order to improve the safety of the aircraft and crew.

After conducting some hazard analysis (as explained in our Summer 2016 article), the committee decides to equip all flight crews with helmets and to require crew members in the front seats to have a visor down at all times. These risk controls are aimed at lowering the severity of a bird strike.

In addition, the committee found a large percentage of bird strikes appeared to be near a specific geographical area, a nature preserve. Hoping to reduce the likelihood of a strike, they implement new training for staff designed to help them plan flights that avoid this high-risk area as often as possible.

Create Metrics

So far, our safety committee has defined the hazard — bird strikes — and rated the level of risk it posed to our operation: Category 5. Next, the committee identified several approaches to lessen the severity and likelihood of bird strikes. Now it’s time to create metrics around our risk controls.

Metrics are important because they provide context for our risk controls. Metrics tell us where we begin, where we want to go, when we reach our target, and whether our efforts are or are not working.

For example, we note that there were four bird strikes in the last six months. Only 10 percent of our flight crews have helmets with a visor system. This is our starting line.

The committee sets two follow-up dates with associated objectives to help us reach our goal.

The first objective is that within 90 days, all training is complete, helmet bids are received, and a purchase plan is in place. When
implementing a new risk control, it’s a good idea to create a 90-day phase-in period. The majority of new ideas fail within three months, so building in an early evaluation will enable you to spot implementation issues and possibly tweak strategies.

Next, the committee sets a longer-term objective: after nine months, there will be a 50 percent reduction in the number of bird strikes and 80 percent of crews will have helmets and be wearing them. This longer term objective is nine months out because the committee wants six months of data after the initial 90-day set-up phase.

Why not set an objective of 100 percent for both crew compliance and bird-strike reduction? Remember, these are objectives, not goals. The goal is 100 percent, but in the real world we understand that often it takes time to get there. Stay realistic and keep the objectives achievable.

**Measure Implementation and Risk**

At our follow-up dates, it is time to hook up the gauges and check the performance of our SMS engine. We want to measure two specific indicators: implementation and risk.

First, how well was the proposed risk control implemented? We all know that some risk control ideas do not materialize as planned, if they even make it off the paper at all. That idea that sounded so great in the conference room sometimes does not work so well in the cockpit.

So how did we do? Were the helmets purchased? Have flight crews been avoiding the nature preserve as planned? Did they all get trained?

The answers should be more than just yes or no. Just as you created metrics for your objectives, express your progress in numbers as well. How many helmets were purchased? What percentage of training was completed? How many times have crews still flown over the nature preserve?

Second, we want to reevaluate the risk score. Has there been a shift in either the likelihood or severity? If so, what is the score now? Again, we want a number. Safety performance needs to be a fact, not an opinion.

Let’s say that after six months of utilizing new flight-planning procedures designed to avoid the nature preserve, we had two bird strikes. This is 50 percent less than the number of strikes in the six months before the new procedures.

Looking at our risk matrix (figure 2), we see that we can lower our likelihood category to occasional, or remote, depending on the definitions set for each category by your committee (see Winter 2016, p. 88 for more information on category definitions). Simply reducing the likelihood of a bird strike lessened the risk. If we continue to implement this new procedure, we may see the number of strikes decrease even further in the following six months, changing that risk score even more.

If we have been successful in purchasing and using helmets with visors, the severity element of our risk score will be lowered as well. Let’s say that regular use of helmets and visors lowers the severity of a bird strike to marginal.

**Safety by the Numbers**

By implementing our risk control plan, we have lowered the risk posed to our operation by bird strikes from a Category 5 (probable and critical) to a Category 11 (occasional and marginal). We now have a definite, quantified answer when asked about the benefits of implementing the risk controls.

When questioned about the increased fuel costs from using alternate flight routes or additional funds for helmets, the best answer a safety officer working outside of the SMS process could give is often “Yes, it seems to be working.” This is a subjective statement that could easily be argued against.

With the benefit of the data-driven SMS process, we have a much better answer when flight crews question the necessity of doing additional work or adjusting to new equipment. Now our answer is “Yes, it is working. Our incident rate has decreased 50 percent, and the severity of a bird strike — the risk of one turning into a critical incident — has been decreased from a high to moderate risk level. Overall, the risk score associated with this hazard has improved 54.5 percent.”

Your results may not be a 100 percent reduction of the risk. In fact, in the real world, they probably won’t. We can lower the likelihood of a bird strike and lessen its severity, but without taking birds out of the air, there isn’t a way to eliminate the risk. But SMS is not about eliminating risk. It’s about analyzing hazards, targeting the ones that pose the most risk, and employing data-driven strategies to decrease the risk.

**Focus on What Works**

You devil’s advocates out there have noticed that this is a best-case scenario; in the real world, things do not always go according to plan. You are right.

How often have you encountered safety training, equipment, or procedures that simply do not work? For most, several examples come to

<table>
<thead>
<tr>
<th>Severity</th>
<th>Frequent</th>
<th>Probable</th>
<th>Occasional</th>
<th>Remote</th>
<th>Improbable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Catastrophic</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>II. Critical</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>III. Marginal</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>IV. Negligible</td>
<td>13</td>
<td>16</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>

![Figure 2. A sample risk assessment matrix.](image-url)
mind. It’s bad enough that they don’t accomplish their purpose of making us safer. Even worse, those lame-duck items linger around, dragging down our operations and adding work to an already busy day for no discernable reason.

Why is it so difficult to abandon them? Often it is because of fear. Safety policies and procedures, once established, become unquestioned gospel. Few of us are willing to get rid of them unless we are 100 percent certain that eliminating the element in question will not lead to disaster down the road.

We all have ineffective safety “stuff” in our operations. SMS can help us fix that. Remember, one way in which SMS is a different approach to safety is its emphasis on metrics and data. We use a numeric score in our risk assessment matrix so we can keep focused on the hazards that pose serious risk to our operations and not be sidetracked by those that don’t. When we plan risk controls, we use metrics to create a baseline of where we started and metrics to define what success looks like. During our risk assessment, we measure progress numerically, so we can keep controls that work and adjust or eliminate those that don’t.

**Real-World Implementation**

Unfortunately, in the real world, risk controls are not always successful. But because our risk controls are based on metrics that can be analyzed, we can go back and see what part of the implementation plan did or didn’t work. Let’s look at the four different scenarios (figure 3) that can occur when you implement a risk control in an effort to improve a risk score.

**Effective Implementation, Improved Risk Score**

This scenario is the best case possible: your implementation plan was carried out successfully, and your objectives were met. The result is an improved risk score.

Continue to measure the performance of your risk control and tweak the implementation plan as necessary. We need to ensure the risk control continues to perform as expected, and to try to reduce risk even more if possible. Also, data is generally not considered valid until you have about two years’ worth. Continuing to monitor performance will help confirm the improvement was not just coincidence.

**Poor Implementation, No Improvement in Risk Score**

Sometimes, when we look at the implementation portion of a risk control, we see that the risk control was not implemented as planned. There are numerous reasons why this could happen: lack of funding, poor training, uncooperative staff, incompatibility with real-world operations, and so on. As a result, the targeted risk score is not improving. Instead, it is the same or even worse.

It is time to tell your safety committee that the plan is not working because of poor implementation. Some plans are great on paper, but
difficult or impossible to implement. Don’t be in love with the plan, be in love with results. The team needs to determine what is stalling the process and either fix it or design a new implementation plan.

**Poor Implementation, Improved Risk Score**

Another possible result is that the risk score has improved despite the lack of implementation. This usually indicates that your planned risk control has little influence on the targeted hazard. For example, let’s say that bird strikes have decreased even though aircrews are still flying the same routes over the nature preserve.

When this happens, you should go back to the safety committee and look at all of the hazard elements uncovered in your analysis (see the Summer 2016 article for more information on hazard analysis). Is there another one that may have a more powerful effect on risk? Is there a different way to attack the same element? For example, a different altitude or different route around the preserve?

**Effective Implementation, No Improvement in Risk Score**

The fourth option is a risk control that was implemented as designed and yet, the risk score for the hazard has not improved. Again, this happens when we target an element of the hazard that does not have a major influence on the overall risk. In our case, it may be that flying over the nature preserve did not really influence the risk of a bird strike.

As in the “Poor Implementation, Improved Risk Score” scenario above, it is time to change the plan.

Go back to the safety committee and brainstorm what else influences the risk level and redesign your implementation plan.

**Keep Only What Works**

Whatever the reason, unless you have positive performance in both implementation and risk, stop what you are doing. Something needs to be fixed. Do not continue simply because the plan was given the “safety” stamp of approval.

“*Safer*” is a quantitatively verified reduction in the likelihood or severity of an identified hazard at your operation. There is no reason to settle for anything less.

It may seem embarrassing when our plans do not work out. However, it is important to let everybody know that a poorly performing risk control will not be tolerated. This sends a message that any safety-related equipment, policies, and procedures are there because they actually work, not to satisfy the requirement that a box be checked on an arbitrary safety checklist. By emphasizing your interest in effective safety measures, you will reinforce confidence in those risk controls that do survive the performance test.

**The End?**

Here we are at the end of our process to control the risk of bird strikes … or are we?

That’s a trick question, really, because safety is an ongoing process — a journey, not a destination. Conducting 100 days of accident- and incident-free operations does not mean that the 101st day is risk-free.

One of the strengths of SMS is that it recognizes that managing safety is a continuing process. All of the performance information from our risk assurance efforts — both good and bad — should be analyzed and harvested for data to be fed back into the front of our SMS engine. It is all useful hazard information that can be used to improve our future risk analysis, risk control, and risk assurance efforts.

Remember, performance markers are the objectives we set to help us achieve our goals. They are bricks in the road to a safer workplace. Regular checks on this data lets us know where we are on that pathway, and what we need to adjust to keep us on the road.

Nothing is sacred but the goal of conducting our operations as safely as practical. Anything that does not help us meet that goal is subject to change. Empower yourself with the facts needed to make the necessary decisions.

Safety officers are often asked, “Does all this work on safety actually make us safer?” The question cannot be answered without defining what safer is. It is not necessarily the absence of accidents — that may mean we are just lucky. And many years of accident data show that having a collection of safety documents and policies or posters on the wall does not make us safer.

Safer is a quantitatively verified reduction in the likelihood or severity of an identified hazard at your operation. There is no reason to settle for anything less. R

Bryan Smith is a member of the U.S. Helicopter Safety Team (USHST) — part of the International Helicopter Safety Team — and serves on the USHST SMS Workgroup. He is also the safety program manager for the Airborne Law Enforcement Association (ALEA). Bryan is a full-time pilot for a sheriff’s office in central Florida, where he flies a variety of public-safety missions.
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Managing Distractions and Priorities during Flight

In Order of Priority

By Steve Sparks

Much like flying a helicopter, driving a car safely on busy streets and highways involves setting priorities on the thing that matters most: getting from point A to point B safely. Many accidents occur not because drivers and pilots lack skill but because they get distracted by unimportant issues. Lack of focus on time-critical priorities is becoming a leading cause of human error, and thus accidents, both on roads and in the air.

Distraction in Action
What qualifies as a distraction? Distraction means: to draw apart; to turn aside; to draw or direct to a different object or in different directions at the same time. In other words, to be distracted, the attention of a pilot must be drawn away from the task or tasks that he or she should be focused on.

The distraction could be a trivial matter, such as a new text message or discussing weekend plans with the co-pilot, or it could be a serious issue concerning weather or flight operations. What matters is that the item draws the pilot’s attention away from the most important task: flying the aircraft.

Throughout training, pilots are constantly reminded to aviate, navigate, and communicate, in that order. This common prioritization schedule is often emphasized as a defense mechanism to cue pilots away from nonessential activities. The challenge for helicopter pilots is to schedule their activities in a way that ensures safety-critical items remain the top priority.

Multitasking? Not So Much
Generally speaking, humans are only able to perform two tasks concurrently in limited situations, even
if they are skillful when each task is performed separately. A pilot may be exceptionally skilled at programming the flight management system and at maintaining situational awareness, but while that same pilot is conducting one of these tasks, the precision of the second often suffers.

If an ongoing task requires considerable mindful resources, it is nearly impossible to effectively perform a secondary task simultaneously with success. Humans — and that includes pilots — are just not that good at multitasking.

If an ongoing task is interrupted by a lower priority event, pilots have two choices: they must learn how to allocate their attention to handle both tasks concurrently or they can return to the higher priority one and deal with the lower priority task when time permits. While certain distractions reveal themselves sequentially, others demand attention simultaneously and can easily disrupt the pilot’s conduct of the flight.

Let’s look at what causes some of these distractions, along with some effective coping strategies you can use on your next flight.

Setting Priorities
When trying to sort through priorities, helicopter pilots must consider the level of urgency and the criticality of the event. Urgency relates to timing: urgent matters by definition call for immediate attention. Criticality refers more to the importance of the situation. A situation may be critical, meaning a turning point or juncture will be reached, but it is not necessarily urgent. The turning point may not occur for some time.

Another factor to consider is the amount of time necessary to resolve a situation. Some distractions, such as a passenger request or noncritical radio call, can be resolved quickly, leaving the pilot free to return to more important tasks.

However, always retain awareness of how much time you can spend on the lower priority task before you need to return to the higher level one. If, for example, your initial attempt to resolve a radio call doesn’t work, do not become so fixated on working to resolve the problem that you forget to perform higher priority functions.

Urgency, criticality, time expended for resolution: these factors are consciously and subconsciously considered by helicopter pilots each time their priority schedule changes.

Attention on Deck
Tunnel vision, or fixation, often translates into degraded pilot performance. Situations that demand pilot attention for prolonged periods of time will often have an adverse effect on other aspects of flight. While some situations require more focused attention on a particular area or task, others require pilots to divide their attention among several different actions. As these scenarios play out, it is often difficult to prioritize effectively, especially when things get busy.

The ability to handle concurrent
tasks is essential, but at times, it is difficult because events often present themselves unexpectedly. Learning how to allocate time among various tasks efficiently is critical for ensuring safety.

A major factor influencing time-sharing skills in the cockpit is technology. Aircraft systems, cockpit layouts, and automation have a strong influence on how priorities are set and managed. Having an understanding of how to best channel pilots’ visual attention provides a framework to design tools and devices in such a way as to help prevent human error.

Aircraft designers also use auditory announcements to capture pilots’ attention. Auditory announcements are very likely to capture pilot attention, regardless of what activity they are attending to at that time, and so using these types of messages ensures pilots are supplied with timely information for increasing situational awareness and for making sure tasks are completed on a timely basis.

Auditory distractions often cause the most harm to pilot performance because they can capture attention for long periods of time. Pilots are more likely to attend to auditory distractions because of the amount of attention required to capture, process, and respond to such events. Flight alert systems such as enhanced ground proximity warning systems (EGPWS) use digitized voice commands to capture attention, causing pilots to respond more rapidly.

Unfortunately, several helicopter accidents have occurred because pilots have misinterpreted auditory information from other pilots, air traffic control personnel, company dispatchers, and other crew members. To help counteract the consequences of auditory disruptions, system designers are experimenting with data-link technologies to help reduce distractions and ensure accuracy.

Data-link technology provides a means for presenting instructions to pilots in text form to help mitigate or reduce the chances of their misinterpreting information. This method of transmission also provides a backup reference that pilots can revisit to confirm the instructions when time permits.

Options and Solutions

Priorities are always competing with one another for your attention. Several ways to help manage distractions include: developing standard operating procedures (SOPs), consistently following checklists, and ensuring positive aircraft control at all times.

If a task cannot be completed without interruption, give it extra time with added focus. Tune out unwanted distractions by maintaining your full attention on the task at hand. Resist the temptation of trying to do too much with too little time.

Flight instructors, check airmen, and other training providers must make prioritization and distraction management part of their routine training agenda. The cockpit is a busy place, and it is essential that pilots understand how to properly and effectively handle priorities and distractions. These are such important tasks that instructors and trainers should take into consideration how to teach them to pilots from diverse backgrounds that influence their cognitive, learning, and performance outcomes.

The top priorities for a pilot are always to aviate, navigate, and communicate, in that order. For all those nonessential tasks, you can fugeddaboutit.

Dr. Steve Sparks is an aviation safety inspector with the FAA’s General Aviation and Commercial Division specializing in human factors, helicopter operations, and educational outreach initiatives. He serves as coordinator for the U.S. Helicopter Safety Team (USHST) and is also the chairman of the General Aviation Working Group for the International Society of Air Safety Investigators (ISASI).

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**A pilot’s top priorities are to aviate, navigate, and communicate, in that order.**
David Pierson Joins HAI as Director of Marketing and Sales

HAI is pleased to announce the addition of David Pierson to the Business Development team as director of marketing and sales. Dave comes to us from the National Geographic Society where he was manager of marketing and sales for their renowned photography and video archive.

Dave’s additional experiences include marketing in the financial services and consumer electronics industries, but he spent the lion’s share of his career as manager of international marketing communications for Northrop Grumman. At Northrop Grumman, he communicated for their Airborne Radar, Air Traffic Control, and Electronic Countermeasures Divisions.

“I’m really very happy to be back ‘home’ in the industry I grew up in. It feels great to be a part of this amazing, highly respected team,” says Dave.

Dave graduated from Syracuse University with a degree in magazine journalism and lives on the Eastern Shore of Maryland.
November 8–10
Rotorcraft Virtual Engineering Conference
Royal Aeronautical Society
Liverpool, UK
aerosociety.com/Events/Event-List/2051/Rotorcraft-Virtual-Engineering-Conference

November 11–13
21st Annual Helicopter Association of Canada Convention and Trade Show
Helicopter Association of Canada (HAC)
Edmonton, Alberta, Canada
h-a-c.ca/convention.html

November 12–16
Dubai Airshow
Dubai, United Arab Emirates
dubaiairshow.aero

November 14–16
HAI Annual Firefighting Safety Conference
Helicopter Association International (HAI)
Boise, Idaho, USA
https://www.rotor.org/Hiddenforms/FallMeetingRegistrationForm.aspx

November 17–18
Fifth Asian-Australian Rotorcraft Forum
AHS International
Singapore
vtol.org/arf

December 5–8
50th Annual Convention & Exposition National Agricultural Aviation Association (NAAA)
Long Beach, California, USA
agaviation.org/convention

December 6–7
10th Rotorcraft Symposium
European Aviation Safety Agency (EASA)
Cologne, Germany
easa.europa.eu/newsroom-and-events/events/10th-rotorcraft-symposium

December 9
New Mexico Helicopter Safety Day
Vista Grande Community Center
Albuquerque, New Mexico, USA
faasafety.gov/spans/events/EventList.aspx

December 13–15
Air Medical Transport Conference V2.0
Association of Air Medical Servicers (AAMS)
Charlotte, North Carolina, USA
aams.org/events/amtc

January 24–26
Seventh AHS Technical Meeting on VTOL Unmanned Aircraft Systems
AHS International
Mesa, Arizona, USA
vtol.org/events/vtol-unmanned-aircraft-systems

February 7–9
Southeast Region Safety Seminar
Airborne Law Enforcement Association (ALEA)
St. Augustine, Florida, USA
alea.org

February 22–23
Rotorcraft Handling Qualities Technical Meeting
AHS International
Huntsville, Alabama, USA
vtol.org/events/rotorcraft-holding-qualities

March 2–4
2017 International Women in Aviation Conference
Women in Aviation International
Lake Buena Vista, Florida, USA
wai.org/17conference

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Phil Fillingham has had the kind of aviation career you used to read about in boys’ magazines: moving from one adventure to another while braving bears, bugs, disease, mechanical failure, and bandits. At 98 years old, Fillingham reflects on a white-knuckle career traveling the world and living his boyhood dream: to be a pilot.

**An Early Passion for Aviation**

Fillingham was born in 1918 in the village of Cobham, 20 miles from London, where he lived a somewhat Dickensian childhood, other than an early fascination with aviation. He recalls with relish playing with toy airplanes, following the results of seaplane races, and when he was 10, seeing the R34, a British dirigible, flying low over his house and blotting out the sky.

Although he started his adult life as a clerk in London — he’d been barred from the Royal Air Force (RAF) because he didn’t have a college degree — the Bank of London moved him in 1939 to Patagonia, the southernmost region of Argentina. After several stops along the way, he arrived at his posting in Rio Gallegos, after a 18-day trip on a ship where no one else spoke English.

Rio Gallegos was a frontier town, bereft of trees and paved roads, although most of the ranchers spoke English, a vestige of settlement by Falkland Islanders. After a few years, Fillingham was ready to join the British war effort, but he was constrained by his contract to the bank until May 1944, when he was able to return to England and sign up with the Royal Navy. After pilot training in Portsmouth, he was off to New York and then Canada, for further training.

It was in Canada where he met his wife, Monica. They went on to have six children and were married nearly 55 years before her death in 2000.

**Finally in the Cockpit**

It was also in Canada where Fillingham finally got to do some flying, soloing on a wooden Fairchild PT-19 Cornell on January 5, 1945, before receiving further qualifications and his wings on June 11, 1945.

After additional RAF training, Fillingham ended up on the HMS Ocean, out of Malta, where he saw his first helicopter, a U.S. Navy HO3S-1 — a Sikorsky S-51 — on a visiting U.S. aircraft carrier. Returning to England, he continued his training and work as a pilot, including soloing in a glider, but he requested rotary-wing instruction and converted to helicopters in 1948, soloing in November after only 4½ hours of dual instruction and checkout at hover.

Six weeks later, he was the officer in charge of the helicopter unit at the Royal Portland Dockyard-Detached flight, where he continued to gain experience on the Sikorsky R-4, the helicopter he’d checked out on. His work on this helicopter included torpedo trials, radar calibration, air and radio tests, personnel transport, and demonstrations. He also practiced autorotation, conducted dual helicopter flights, was involved in search and rescue, and responded to photography requests. The parachute and dinghy pack he...
wore added enough weight that getting the helicopter airborne required some assistance from the wind.

In 1949, Fillingham carried out more flight testing on the Sikorsky R-4, R-6, and S-51; Bristol Type 171 Sycamore; and Cierva Air Horse helicopters. He also trained new Royal Navy students on the R-6, while conducting autorotation tests on the R-4 and R-6. He also test-flew an instrumented R-4 under the hood. All of this was done as a helicopter test pilot at RAF Station Beaulieu in Hampshire, England.

**Flying the Canadian Bush**

In 1950, after almost 300 hours of helicopter flight time, Fillingham left the Royal Navy. With little in the way of pilot work in England at the time, though, he headed back to Canada — at a time when there were only six helicopters in the whole country. He applied to all Canadian operators but with no luck.

He dodged a bullet, as it were, when, just before starting work as a truck driver for Sears, he got a call from Ottawa-based Spartan Air Services, which needed a pilot for its air survey business. Fillingham learned how to fly Spartan’s Bell 47D and then went off to Knob Lake in Labrador as a bush pilot doing topographical mapping survey work for the Canadian government. The job was not cushy; Fillingham lived out of a tent and used the lake for bathing and drinking water.

He then flew a Bell 47D-1 under contract for the early construction of the Quebec North Shore and Labrador Railway, stretching north to Labrador. Winter conditions were difficult — the helicopter and blades had to be covered every night and a portable Harmon-Nelson heater run every morning to thaw out the helicopter so it could start. Not only...
did he have to land the helicopter on wooden planks so the floats wouldn’t stick to the frozen ground, but belts were constantly failing and had to be replaced, sometimes after only a few hours.

A belt failure forced him to land in a forest area, although he was able to find an open space and land on a frozen lake. Nevertheless, it took 10 days to get replacement belts, at which point the helicopter was buried under 3 feet of snow.

That winter also included a frightening takeoff in an overloaded Noorduyn Norseman from a small lake; a fire protection job at Maniwaki, Quebec, for a first-time roof-top landing; and a barometer traverse job across uncharted Gaspé Peninsula on the way to Newfoundland to do a triangulation survey for a Canadian government topographical survey. Instead of a tent, Fillingham was lodged in a caboose rented from the railroad.

He experienced his second forced landing in 1951, in Newfoundland, while on survey work. This one was caused by a fuel line break as he was over forested country. The engine cut out at 300 feet and he had to perform an autorotation into trees. Fillingham and his surveyor passenger were OK, although the helicopter didn’t make it.

They made the 12-mile trek to a bay, along the way running into a bear — the startled bear headed one way and Fillingham and his companion headed the other — before reaching the bay. Attached to a pole on the pier was an old hand-crank telephone, which they were able to use to get a rescue boat.

Losing the helicopter cost Fillingham his job, but he was able to find work on a railroad line in Manitoba, braving daytime temperatures between -10°F and -25°F in helicopters without heaters, and then work for the same company doing spraying work.

Off to Central America
Fillingham next was recruited by Frank Lee, vice president of a then-little company called Petroleum Bell, which later evolved into PHI, one of the world’s biggest helicopter operators. Lee offered him a job flying in Venezuela; Fillingham first had to obtain his U.S. commercial helicopter rating, which he did in October 1952.

Fillingham went from flying over the frozen North to flying a Bell 47D-1 on geodetic surveys in 106°F heat over mosquito-infested Venezuelan and Colombian jungles. The dense canopy offered little in the way of landing zones, and there was a constant possibility of spark plug fouling on the No. 5 cylinder of the 186-horsepower Franklin engine (this was before the introduction of TCP).

On many missions, Fillingham’s companion was an armed military guard for protection from the bandits who operated in the area. Nights were spent in remote jungle villages in the company of swarms of mosquitoes, relying on local remedies to deal with mosquito bite infections and amoebic dysentery.

During his time in the region, he had to fly around the 18,700-foot Pico Cristobal Colon, the tallest peak of the Sierra Nevada de Santa Maria Mountains. During a 1953 mission, engine failure spurred a forced landing in a cactus forest, stranding him for almost a month while he waited for repairs and dealt with extreme heat, centipedes, and water that had to be boiled and strained several times because of contamination from defecating cattle.

Fillingham transferred to PHI in October 1953 to work in Lafayette, Louisiana, flying gravity work and water-bottom testing, as well as offshore ferrying and flights for Humble Oil. His next assignment was back to South America, where, at the end of 1954, he went to work in Colombia to support a jungle seismic survey team.

He next took on an assignment to fly Sikorsky S-55 and S-58 aircraft in connection with Orinoco Mining Company iron-mining operations. He was told he needed to be checked out by one of the Venezuelan pilots. Problem was, the Venezuelan pilot had never seen an S-55. So Fillingham, who had flown that aircraft during oil exploration missions in the United States, had to teach the fellow the aircraft so he could in turn administer Fillingham’s S-55 check ride.
Unfortunately, the dense canopy so limited helicopter landing zones that the helicopter part of the project was canceled. Fillingham went back to the United States for offshore drilling work in the Gulf of Mexico.

His next assignment was high-altitude flying in 1955 in the foothills of the Sierra Nevada Mountains. He got the job because the chief pilot would not fly above 10,000 feet. The flying was survey work and it was challenging.

To keep weight down, batteries and starters had to be pulled from the engines, which were then hand-cranked. The lack of oxygen at mountain altitudes sometimes required 20 minutes or more of cranking, or backward jump takeoffs. The team accomplished the survey in three months; the previous survey had been completed using mules and took five years to complete.

In all, Fillingham worked for PHI for 11 years. His assignments included survey work in Alaska, where their team cook’s tent was ravaged by bears, and transporting passengers out to Gulf oil rigs that were as much as 150 miles out and tough to find. Fillingham sometimes had to do a square search in order to locate the rig so he could refuel and fly back to base.

After leaving PHI, Fillingham flew a variety of missions for Tenneco Chemicals, including pipeline patrol and offshore and local transport. In 1976, he took over the company’s flight operations in Mahwah, New Jersey, where he flew the New York-Boston-Washington, D.C., corridor. Although he had plenty of experience with the challenges of flying in remote areas, he now had to learn how to operate in high-density traffic and total radio control.

In 1978, after 15 years with Tenneco, Fillingham hit 60 and was forced to retire. During his time with PHI and Tenneco, he flew a variety of helicopters, including the Hiller 12E, various Bell 47 models, Sikorsky S-55s and -62s, the Sud Aviation Alouette II, the Bell 206 JetRanger, and the MBB Bo 105.

Life as an Itinerant Helicopter Pilot

Fillingham kept flying, though, working briefly to ferry a Kentucky millionaire coal miner out to his site at 5 a.m. each morning and back at 5 p.m., about 100 miles each way. For the next several years, he flew for contracts all over the United States.

In 1981, Fillingham was flying fire suppression flights at a dizzying rate. From June through September, he jumped around, fighting fires, doing rescues, and flying sling loads in places including Arizona, Utah, Colorado, Idaho, and Wyoming.

On one of those trips, Fillingham performed an extraordinary rescue. He was called to save an injured mountain climber trapped on a ledge about 12,000 feet up.

Using sling-load experience, Fillingham had a 100-ft line and stretcher attached to his helicopter. Ascending with two mountain climbers aboard to help, he hovered near the ledge.

When he could not get close enough to the ledge, he rocked the cabin back and forth until the two climbers were able to get a grip on it. He then lowered his helicopter to give them some slack so the rescue climbers were able load the injured climber onto the stretcher and Fillingham was able to lower him to an ambulance on the ground. Fillingham received Forest Service and Park Service commendations for the rescue.
“Take Advantage of Every Opportunity”

At the end of September 1981, Fillingham returned to his home in Monroe, New York, after a career that had included 13,674 helicopter and 581 fixed-wing hours.

In 1984, Fillingham survived a heart attack, which put him in the hospital for six weeks, but he embarked on a second career as a photographer for his weekly newspaper. For years he made additional money on weekends taking pictures, and he has a massive collection of photos from his career.

After the death of his wife, Monica, Fillingham reconnected with Helen McQuibban Andrews, a woman he had dated back in Patagonia in the early 1940s. He had proposed to her then and was soundly rejected. Age and health issues now keep the couple apart, although they still communicate through letters. Fillingham now lives with his daughter Mary in Monroe, New York.

Fillingham is a Twirly Bird member and a 2004 recipient of the Les Morris Award, the organization's highest honor, reserved for members who have made an exemplary contribution to the helicopter community.

In reminiscing about a career spent exploring “this wondrous world,” Fillingham offers some advice to young people — really, to all those who find themselves at a critical crossroad.

“We all start life as a blank slate,” he says. “As time goes on, various opportunities occur to each of us. Some tuck them away in their memory as a positive — others do not. None of us knows what’s around the next corner.

“Growing up poor, how could I even imagine that I would spend five years in South America, a year in Canada being taught to fly — my life’s ambition — married to a beautiful woman, fatherhood. All this before I was 30. It happened because I took advantage of every opportunity presented to me.”

Martin J. Pociask is curator for Helicopter Foundation International.

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# Market Trends

## U.S. Turbine Sales, July–September 2016

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<th>Jul-16</th>
<th>Aug-16</th>
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<td>Total Turbine</td>
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## U.S. Piston Sales, July–September 2016

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<tr>
<td>Total Piston</td>
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## Non-U.S. Piston and Turbine Sales, July–September 2016

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<tr>
<td>Total Turbine</td>
<td>42</td>
<td>67</td>
<td>72</td>
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$500 First Prize: The best overall photo will be featured in the Winter 2017 ROTOR, and the photographer will receive a $500 cash prize.

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• Any photographer is eligible to enter, whether professional or amateur, HAI member or nonmember.
• Each photographer may upload up to 5 photos in each category, for a maximum of 25 photos.
• Only certain file types are accepted. See the complete list of rules at photo.rotor.org.
• Each photo must contain at least part or all of a helicopter.
• All photos must be the original work of the entering photographer.
• All entries must be uploaded to photo.rotor.org by midnight ET on Dec. 1, 2016.

For a full list of contest rules, visit photo.rotor.org.
Louis Magnan has been around aviation for as long as he can remember. His father had his fixed-wing commercial pilot’s license and is a Transport Canada–licensed aircraft maintenance engineer (AME).

Louis aimed to go to university to study engineering. However, college is mandatory before university in Quebec, so after high school, Louis began looking into different technical college programs. He chose a cooperative program focused on becoming an AME.

While enrolled in the co-op program, Louis alternated between work and school from one semester to the next. He had the chance to work for two helicopter operators during the program and really enjoyed the industry. The co-op program took a little longer to complete than others — four years instead of three — but it gave him the opportunity to gain valuable experience as an AME apprentice. This later proved essential as Louis graduated during the largest economic recession in recent history.

Before Louis graduated from his co-op program in 2009, he had the chance to work weekends for a fixed-wing maintenance, repair, and overhaul shop at an airport in Montreal. Although it wasn’t the type of work he enjoyed the most, he considered himself lucky to have a job and started full-time as soon as school was over.

During that summer, the company began a series of layoffs. Louis next found a position at a small fixed-wing charter operator.

However, Louis missed the versatility and travel associated with the helicopter industry and heard about the HFI Bill Sanderson Aviation Maintenance Technician Scholarship. Thinking that having a type course on his résumé would be a good way to have something to offer to a potential employer, Louis applied for the Bill Sanderson scholarship and was awarded one in 2010.

Louis used the scholarship money to offset expenses associated with attending his type training courses:

- An AS350/Arriel 1 course from Eurocopter Canada (Saint-Hubert, Quebec)
- A 206/RR250 course from the Bell Academy (Les Cedres, Quebec)
- A PT6T course from Westpoint Helicopter Services (Kelowna, British Columbia).

In addition, Louis recently took an AS355F difference course from Airbus Helicopters Canada in Les Cedres, Quebec.

Louis now holds Transport Canada aircraft certification authority for the AS350 series, Bell 206 series, AS355F series, and the Bell 212/412. This means he is qualified to sign off on maintenance for those aircraft. He also holds a specific ultrasonic nondestructive testing certification authority for Bell 212 main rotor blade grips.

Louis has been working for Canadian Helicopters Limited in Les Cedres, Quebec, for the past five years. “I was what they call a pool engineer, somebody who travels with the aircraft on different job sites until last year, where they asked me to transition into a based lead engineer position. I am now working on their AS350 12-year inspections, although a lot of my time has been devoted to aircraft importations and exportations and other special projects.”

Louis acknowledges that rotorcraft maintenance is a difficult business to get into. However, he recommends always being ready for the next challenge, even though it might not be one you’re looking for. “I can truly say I’ve learned something from every situation I’ve had to deal with,” he says.

HFI offers up to 19 scholarships each year to help support students studying to become part of tomorrow’s vertical aviation industry. Applications for 2017 are now being accepted for:

- Bill Sanderson Aviation Maintenance Technician Scholarships
- Commercial Helicopter Pilot Rating Scholarships
- Maintenance Technician Certificate Scholarships
- Michelle North Scholarship for Safety.

Learn more and apply at helicopterfoundation.org/scholarships. The application deadline is November 30, 2016.
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