2018 Photo Contest Winners

Lower Your Risk of Bird Strikes  
*p 22*

Brexit and British Aviation  
*p 16*

Did the Pilot's Success Contribute to the Accident?  
*p 66*
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About the cover: Amateur photographer John Luciano took this shot of a Boeing CH-47 Chinook operated by Columbia Helicopters working on the 2017 Canyon Fire in Orange County, California. The lights, sunset, and aircraft combine to make a magical image, earning Luciano an Honorable Mention in this year’s Rotor Magazine Photography and Video Contest.

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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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HAI Belongs to You

The significance of being the first HAI chairman from the government services seat on the association’s Board of Directors is not lost on me. When I first joined HAI, I was not sure that this was even a possibility.

In This Together
Much credit goes to former HAI President Roy Resavage for reaching out to me as president of the Airborne Law Enforcement Association to bridge a void that existed between the two groups. I recall Roy telling me that while the helicopter world is a small one, there is enough to go around for everyone.

An advocate for the entire helicopter community, Roy invited me to meet his successor, Matt Zuccaro, and he held a meeting between just the three of us during which he shared his vision. Matt has continued with Roy’s initiative. For this, I am grateful to them both.

The helicopter community is indeed a small one, and we need to look after each other. Much like law enforcement and our thin blue line, those of us in the helicopter industry are constantly facing challenges, and we are stronger facing them united. There is no place any more for the us vs. them, public safety vs. private sector, fire vs. police mentality. We need to find ways to work together and promote the industry for the common good of all helicopter operations.

Become an Active Member
Active members in an association can have a profound impact on it and the industry they serve. I can think of several colleagues who, while serving as volunteers on HAI committees, have made a difference in industry issues such as regulations, safety, and noise reduction.

The two top reasons people join associations are to access specialized information and to network. HAI programs, and especially HAI HELI-EXPO®, provide opportunities to do both. There is no other place in the world that brings together all facets of the helicopter industry like HAI HELI-EXPO. It truly is the one don’t-miss event of the year for the helicopter world. Your HAI membership provides discounts to this annual event. This benefit alone is worth the cost of signing up!

HAI exists for you and because of you. Your active participation in your association is an investment in yourself. Become actively involved in HAI: join a committee, write an article for ROTOR, teach a Rotor Safety Challenge session, exhibit your products, run for the board. The opportunities are boundless and the rewards priceless.

Dan Schwarzbach is the current chairman of HAI’s Board of Directors, a senior police officer for the Houston Police Department, and the executive director of the Airborne Public Safety Association.

New Year, New Name, New Event
As most of you are aware, besides my duties with the Houston Police Department, I am also the executive director of the former Airborne Law Enforcement Association (ALEA), which January 1, 2018, rebranded as the Airborne Public Safety Association (APSA).

This name change was the last step and most outward sign of internal changes that had been taking place within the association for several years. The primary reason for the changes was to be more inclusive of the entirety of those involved in public safety aircraft operations, including law enforcement, firefighting, search and rescue, economic medical services, natural resources, public utilities, and emergency management, as well as providers of the goods and services to these segments.

So how does this relate to HAI? For several years, HAI has generously provided meeting space for the Helicopter Rescue and Response Association (HRRA) to conduct their Rescue Summit, held annually in conjunction with HAI HELI-EXPO.

Because of APSA’s wider focus on all public safety aviation, the HRRA board of directors voted to dissolve the association and merge their membership into APSA. Therefore, Rescue Summit 2018 will be an APSA-produced event, with HAI continuing to provide the meeting space.

If you are involved in helicopter search-and-rescue for a public safety entity, or if you are simply interested in learning more, I invite you to attend Rescue Summit 2018. Dates and location are listed above; visit publicsafetyaviation.org for more information, including online registration and the training agenda.
Visit the U.S. Forest Service and Department of the Interior at HAI HELI-EXPO 2018

Aerial Firefighting Sessions at HAI HELI-EXPO 2018

- Aerial Firefighting and Natural Resources Committee Meeting
  Wed., Feb. 28
  8:00 AM – 10:30 AM
  N111

- Annual DOI/USFS Interagency Fire Briefing
  Wed., Feb. 28
  10:30 AM – 12:30 PM
  N237/N239

You can also visit representatives of the U.S. Department of the Interior (Booth #C1941) and the U.S. Forest Service (Booth #C1942) on the HAI HELI-EXPO 2018 show floor.

Visit heliexpo.rotor.org for updated information or check your Program & Exhibit Guide on site.
Never Forget Where You Came From

Amid all the excitement associated with the approaching HAI HELI-EXPO® to be held in Las Vegas, I think it is appropriate to pause and acknowledge the 70th anniversary of Helicopter Association International (HAI), which was founded on December 13, 1948. Beginning with that initial meeting of 14 helicopter pioneers, HAI has reflected the industry it represents.

In acknowledgment of the founders’ location, the original group took the name California Helicopter Association. Back then, flight training cost $55 per hour, and you could purchase a tour ride for $5.

In 1951, the association had grown to 17 operator members flying 50 helicopters in multiple states. Thus, it decided to change its name to Helicopter Association of America (HAA). Over the years, operational and technological advancements, coupled with public acceptance, fostered international growth and an industry expansion of missions.

As HAA grew and international membership increased, another name change was implemented. In 1981, HAI was born. Today, we continue our advocacy on behalf of our 3,500 members who safely fly more than 5,300 helicopters 2.3 million flight hours a year.

During my 50 years in this industry, I have many fond memories of taking part in conversations with my peers. During these sessions, we sit back, relax, and try to impress each other with our war stories and exploits, and what a great time we have had being part of the helicopter community.

Just when I think I have seen and done it all, I experience a reality check that brings me back to ground. It comes when I meet or talk with the true pioneers of this industry, those ladies and gentlemen who started it all — before my generation had even entered the world. I have been extremely fortunate to have had the opportunity to interact with so many industry founders over these many years and have truly cherished each encounter.

Until you hear the stories from those who experienced it, you cannot appreciate what it took to establish the helicopter industry. The problems we experience in today’s operating environment pale in comparison to the challenges our predecessors had to deal with. In many instances, they had to make it up as they went along as there was no experience base or precedent. Many now-vibrant sectors of our industry began by someone saying, “Why don’t we try …” In the early days, financial reward was not the driver as much as a passion for the machines and their potential.

I sincerely appreciate the tenacity, focus, and optimism of our founders. Without their efforts, none of us would have been able to do what we do.

While I hold tight to our history and beginnings, I also look to our future. In an effort to recharge my batteries, whenever I can, I visit and speak with instructors and the young men and women who are studying to be pilots and maintenance technicians.

Their enthusiasm, commitment, and passion for all things helicopter is infectious. Their faces and voices reflect the future of the helicopter community, and their joy and pride in their work connects them to a proud tradition. Try to remember the first time you soloed, if you’re a pilot or, if you are a maintenance technician, the first time you signed the logbook to return an aircraft to service, and you will know what I mean.

The other benchmark that gives me optimism about our future is the true commitment in all sectors of the international helicopter community to safety as a first priority, above all else. This emphasis on safety in operations is the highest it has ever been in our history. Our goal of zero accidents is within sight.

On your travels throughout our world of helicopters, if you happen to have the opportunity to meet one of this industry’s founders or long-time participants, I suggest you stop what you’re doing. Relax, listen, enjoy, and say thank you. I guarantee you will learn something and be better for it.

HAI has a long-standing commitment to the preservation of our heritage via our charitable arm, Helicopter Foundation International (HFI). Take a minute and visit helicopterfoundation.org for ways you can assist in this effort. You will also see on p. 78 a list of HFI activities to be held at HAI HELI-EXPO 2018. Supporting the foundation offers us a way to connect with both our industry’s past and its future.

Bottom line: if not for our founders, we would have to get real jobs and have much less fun. Do not forget where you came from. I am a helicopter pilot and proud of it.

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

Fly safe — fly neighborly!

Best Regards,

Matt Zuccaro

Matt Zuccaro is president and CEO of HAI.
2018 Salute to Excellence Awards

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Buckle Up; It’s Bumpy Out There

Turbulence is one of Mother Nature’s most feared invisible forces. It can cause helicopters to behave like contortionists, shaking violently while trying to escape its clutches. Unfortunately, current technology does not allow us to accurately predict its location or intensity.

It seems that crosswinds and turbulence are delighted to hang out near helicopter landing sites, just waiting to ensnare their next victim. Operators are encouraged to obtain additional practice with their most trusted flight instructor to be prepared for any unexpected turbulence that may occur. Pilot proficiency is the surest way to send this despicable villain howling away in the wind.

PIT Stop
When discussing turbulence, there is a strange phenomenon roaming the halls of aviation. This can influence pilot performance, regardless of experience. No, this phenomenon is not mentioned in any FAA handbook, so don’t waste your time looking. Here’s a hint — it’s man-made.

The phenomenon is pilot-induced turbulence (PIT). Unfortunately, some pilots create more turbulence from their own sloppy flying than what is caused by Mother Nature. PIT is often worse than plain old turbulence itself. Sound strange?

For pilots striving for smoothness, professionalism, and passenger comfort, PIT is easy to notice and even easier to feel. Yes, this habit can be hard to break, but it is also easy to solve. A little self-awareness goes a long way in smoothing things out.

With this in mind, pilots are cautioned to pay closer attention to their own jittery habits while on the flight controls, because passengers ultimately feel the effect. PIT can be reduced and even avoided with proper training and practice.

Mechanical Turbulence
Mechanical turbulence is another factor we need to consider, especially during landings. Mechanical turbulence is generated by seemingly harmless winds blowing around man-made or natural contours, causing airflow to churn from its natural state. These conditions often lead to unpredictable circumstances for unsuspecting pilots. Mechanical turbulence can interfere with a pilot’s stabilized approach without warning, throwing them off-kilter.

The unintended consequences from hangars and other poorly planned structures near landing sites can be devastating, but pilots can reduce their risk by maintaining a little extra airspeed while on approach to a landing zone. Awareness is key here: by expecting increased turbulence when landing in tight areas surrounded by buildings or structures, you will be better able to compensate for it.

Clear as Mud
Clear-air turbulence is one of the strongest forces in Mother Nature’s recipe book. It is often generated from rapid atmospheric changes, narrow pressure gradients, erratic jet streams, and thunderstorm development. Clear-air turbulence packs a mean punch, leaving pilots feeling dazed and confused.

For unexpected encounters with clear-air turbulence, pilots should try to maintain aircraft attitude. From a priority perspective, maintain attitude control, slow the aircraft to or below minimum controllable airspeed, and confess your situation to air traffic control. In most cases, pilots are wise to make an unplanned stop to wait these conditions out, rather than pressing on.

Buckle Up
Since turbulence can lurk at any altitude, pilots and passengers should keep their seatbelt shoulder harnesses fastened at all times. This is the surest way to prevent injury and to defend against unintentionally bumping flight controls or switches in the cockpit. There have been cases where turbulence has knocked pilots unconscious from hitting their heads on cockpit structures. Talk about being knocked for a loop.

Landing in gusty crosswind conditions requires skill in a multi-dimensional phase of flight. Pilots have to quickly handle a variety of forces being exerted on the aircraft. Keeping one’s cool while maintaining positive control is the name of the game.

Plan for the Unplanned
Prior to landing, pilots should always rehearse what their Plan B is going to be, should excessive turbulence factor in. Contingency planning eliminates a lot of pressure on pilots and can increase safety exponentially. Executing a timely go-around in response to a botched landing is smart. Cutting your losses early and getting away from the surface is the surest way to avoid disaster.

Regardless of technique, landing in gusty turbulent conditions requires helicopter pilots to continue flying their aircraft even after touchdown. Just because a pilot feels the landing skids touch the surface does not mean it’s time to take a breather. Any momentary letdown could result in loss of control, so remember, never ever stop flying the aircraft until it is safely secured on the pad.

Steve Sparks is HAI’s director of safety and serves as coordinator for the US Helicopter Safety Team (USHST). He is a dual-rated pilot and has a doctorate in applied aviation and space education. Steve can be reached at steve.sparks@rotor.org.
R44

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Not too long ago, I was taking off in an airplane, turning avgas into fun. I had the propeller pointing to the sky, climbing away from the ground and the airport below, when smoke began to roll out from under the instrument panel.

It was a nice clear day with blue skies and no other traffic in the area of the nontowered airport, so I just leveled off and did a 180-degree turn to return to the airport. I turned off the avionics master switch and landed back at the airport without further incident. A couple of days of troubleshooting ensued to find the instigator of my smoky encounter.

As it turns out, a nut from years past had fallen from someplace behind the instrument panel, perhaps lodged in a wire bundle or maybe wedged in a spot on a mounting flange, and landed right smack in between two poles of the master switch. The nut welded itself in place and caused the wires attached to the master switch to burn through, producing the smoke in the cockpit.

I searched for where it could have come, but nothing was missing a nut. The threads showed no sign of recent use. My guess is that during some maintenance or avionics upgrade, the technician dropped or lost the nut and, after a brief search with no success, simply replaced it with another one.

Years later, during my brief flight, I had found it. Lucky me. Two weeks earlier, I was flying that same aircraft in instrument meteorological conditions on a cross-country flight. Imagine what my situation would have been if that nut had fallen into the same position during that flight. As a minimum, it would have been high excitement.

Lucky me indeed.

This story isn’t unique or unusual. I think lost hardware is high on the list of things we try to avoid. It happens though, especially if the conditions are not as good as we would like. Maybe we are working on the ramp or at night, or both. Maybe it’s cold or wet, or both. And what if there is a time constraint we are trying to meet? What’s the fine line between moving quickly and moving too quickly?

A fellow pilot was attempting to start a helicopter at a hospital to transport a patient when he had a hot start on one of the engines. That seemed odd — a good pilot in a well-maintained machine — but the result was that the engine had to be inspected before subsequent starts could be performed.

A close examination found a couple of large paper towels had been ingested into the intake, choking off the cooling air needed for a nice start sequence. The patient didn’t get the necessary flight and had to be transported by ground, increasing the time of transport by a factor of three.

In 1975, while inspecting the Spirit of St. Louis, the airplane that Charles Lindbergh flew on the first solo transatlantic flight in 1927, technicians at the National Air and Space Museum discovered a set of pliers laying under the floor fabric behind an instrument panel. The tool appeared to be part of the original aircraft toolkit and is presumed to have been there since the airplane left the Ryan Aircraft Company factory in 1927.

We have gotten much better over the years, but tool control has long been a cause for concern in many operations. Unaccounted-for tools have contributed to many accidents or incidents in years past. As an industry, we have gotten the message on tool control and it’s likely if you visit a hangar, you will see that your maintenance technician has a nice set of expensive tools laid out in a handsome toolbox, with each tool having its own shadow spot.

Statistics show that few accidents are caused by maintenance errors these days, and the machines we are working on and maintaining are well-designed and manufactured. Even the older aircraft are retrofitted with new and improved components.

We have the perfect opportunity to turn this remarkable maintenance status into a phenomenal record of no accidents or incidents attributed to technician error. Let’s work together to reduce our input to accidents by keeping accountability of all things we touch in the maintenance process — including stray hardware and paper towels.

Maintain Accountability

Zac Noble is HAI’s deputy director of flight operations and technical services. He is a dual-rated ATP, CFII, and A&P/IA. Zac can be reached at zac.noble@rotor.org.
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Engage with Your Government

We live in interesting times. Your perspective on the recent government shutdown may range from enthusiasm to exasperation, or somewhere in between. You may view yourself as Republican, Democrat, leaning right, leaning left. Maybe you are red, blue, or purple.

President Trump has now been in office for one year. Maybe you feel he is draining the swamp. Or maybe you feel he is just adding to the quagmire. The beauty of America is that while respecting the rule of law, we can engage at all levels to provide our voice and perspective on the direction of our great country.

The Rule of Law
The US helicopter industry is heavily regulated, with many of those regulations derived in the pursuit of safety. From aircraft certification and training requirements to how we fly from one destination to another, everything from A to Z seems to be addressed through government regulation and oversight. For all of our reactions (good or bad) about regulations — and the resulting paperwork — they can provide benefits.

One result of our system is the certainty it provides. Did the avgas you just purchased meet the listed specifications? How did the new charter outfit you just hired obtain their operating certificate? By meeting the FAA's requirements, or did somebody pay off someone? In some countries, you would have to wonder, but our robust system of regulation and oversight — supported by our respect for the rule of law — means that we don’t wonder but instead go about our business.

Currently, part of the conversation in the halls of government is to what degree should industry participate in the rule-making process, and how much should government regulate. Very quickly, the dialogue can degrade to immovable positions of us vs. them, business vs. government, my ideology over yours.

As a young staffer working for a U.S. senator, I was always amazed when constituents would call, fired up because the senator “was working with that devil from the other state.” I always respectfully tried to let the constituent know that the staffer working in the other state was getting the same calls, berating his senator for working with the devil from our state. As strongly as you feel about your position, the opposing party feels just as strongly.

While Congress clashes over large policy issues such as the size of the government and what roles the government should engage in — issues that well-meaning, patriotic people can have fundamental disagreements on (and will continue to disagree on) — we should not lose sight of the certainty and safety our system has produced. Working together, industry and government have created common-sense approaches to our industry’s regulations and laws. They can and should continue this work to improve our legal framework.

The Power of Association
This sounds great on paper, but how does one accomplish that? How does a pilot flying all day to make payroll also engage the government? That’s where your association comes in.

HAI represents you in Congress, and it’s our job to be your voice in Washington, D.C. We are here when you can’t be, and in politics, as the saying goes, if you’re not at the table, you’re on the menu. When it comes to the fight against privatizing the U.S. air traffic control (ATC) system, HAI is working hard to keep our industry off the menu. We have prevented ATC privatization from moving past the House in the FAA reauthorization bill and are working to ensure that it is not attached to a potential infrastructure bill the House will soon draft.

Just as we see better results when industry and government work together to create regulations and laws, the results are more effective when the association and its members work with one voice. We saw that with our legislative efforts on ATC privatization. HAI, along with the other general aviation associations, was the first line of defense in stopping the bill. However, once our members got involved and voiced their opposition to their elected officials, we saw the power of our collective voice.

Politicians are truly interested in listening to their constituents. Whether that’s because they want to represent your views or need your support to win reelection is open to interpretation. But the point is that you will be listened to.

That is the power of grassroots advocacy. However, unless you have a dazzling following on Twitter or other social media platforms, one single voice may not cut through the clutter. That’s why an association is so important. A single strand from a rope is easy to break. However, the collective strength of all the strands woven together into one rope creates a power that can be close to unbreakable.

When our members speak out, it empowers all members of the association, which HAI then leverages in Congress. Offices are always very interested in how many members we represent in their specific district or state. Representing a large, active membership from the home district gets representatives’ attention very quickly.

Working together, we can have an impact on Capitol Hill. It doesn’t require much of your time either.
You can be involved as much or little as you like. It can be as simple as emailing, texting, or sending a Facebook post about your opposition to ATC privatization to your elected officials. You can do all that by simply texting ROTOR to 40649. You will receive a link that takes you to the HAI advocacy page where you can edit prepopulated letters to send to your representative.

**The Real World**

If you have a little more time, consider inviting your elected officials to your business. What better way for us to educate officials than by showing them how things work in the real world!

Invite your representatives to your company. Let them see your economic impact to the region, meet with your employees, and hear how regulations can impact your business. We can describe a situation all day long in Washington, D.C., but it won’t have the same impact as seeing it firsthand.

There is a reason why a picture is worth a thousand words.

Congress has their long summer recess in August. When you read this, some of you may still be shoveling snow and can only dream of summer. But if you don’t commit and plan now, August will come and go without a visit by your representative. If you need help with preparing for a visit or even figuring out who your elected officials are, contact me at cade.clark@rotor.org. HAI is here to help. Your outreach and interaction with your representatives will strengthen the entire industry.

Finally, don’t forget to register to vote, and most importantly, make sure you do go vote. Circle the dates of the primary as well as the general election on your calendar. This is your opportunity to cast your ballot and register your voice. There is always a lot of attention paid to the general election, but primaries can be just as important. And remember, when we talk about elections, that includes federal, state, and local. Your local elections are just as important as the one where we elect a president.

So enjoy the interesting times we live in. Don’t pull back thinking your voice can’t be heard or doesn’t have an impact. It already has! Just look at ATC privatization.

Get engaged. It doesn’t matter if your efforts are large or small. What matters is we stand united. Left or right, red, blue, or purple. We can work together and with the government to get common-sense regulations and laws enacted. We can keep our freedom to fly and let Congress know that our ATC is not for sale. Your association is standing strong with the entire membership to keep the rotors turning.

Cade Clark is HAI’s vice president of government affairs. Cade can be reached at cade.clark@rotor.org.
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HAI Professional Education Courses at HAI HELI-EXPO 2018
During the darkest days of World War II, Prime Minister Winston Churchill told the British people, “We shall never surrender.” That’s the attitude the global civilian helicopter industry is taking toward “Brexit,” the term for Britain’s vote in June 2016 and resulting decision to leave the European Union (EU). Analysts expect short-term pain and uncertainty but no lasting damage to helicopter demand or operations.

An Industry Gaining Momentum
In fact, for many helicopter companies doing business with or in the United Kingdom (UK), business has never been better. The major rotorcraft OEMs report record order backlogs. Work and production levels accelerated to new highs in 2017. This momentum is expected to continue in 2018, regardless of Brexit.

Rising oil prices are the major reason. As the largest operating sector within the civilian helicopter industry, energy transport is considered a leading indicator for its health. The civilian helicopter market is benefiting from recovering crude prices, a favorable catalyst that will help the entire industry recover.

Major offshore operators such as Bristow and CHC already are reporting an uptick in contracts and demand; the domino effect is bound to be significant for operators and OEMs. The Organization of Petroleum Exporting Countries’ successful extension in late 2017 of its production cut, combined with a shrinking of the global supply glut, has been buoying energy prices during the latter half of the year.

Crude now hovers at $65 per barrel, above the $50-per-barrel threshold that energy companies need to break even. When the bottom lines of energy companies improve, they feel confident enough to invest again in rotorcraft activities.

As the largest helicopter operator of its type, Houston-based Bristow Helicopters is thriving from the renewed push for deepwater drilling around the world. Shallow oil prospects are always drilled first. For that reason, the prolific oil discoveries of the future lay beneath water deeper than 600 feet, the level typically considered the deepwater mark.

What’s more, new discoveries in the Gulf of Mexico have broken existing deepwater records, pushing rigs into water that’s 3,000 feet deep or more — and it’s this type of ultra-deepwater drilling that’s proving a particular boon for Bristow. Fast, safe, and efficient transport to these remote rigs requires seasoned helicopter operators with the most advanced helicopter models.

Accordingly, Brexit isn’t expected to make a significant dent in operator prosperity. The major OEMs that supply these operators aren’t fretting about Brexit. Bell Helicopter, Sikorsky, Airbus Helicopters (formerly Eurocopter), and Leonardo (formerly AgustaWestland) report business as usual. Their optimistic projections for 2018 remain unchanged.

This hopeful assessment carries over to other major operating sectors, such as helicopter air ambulance and airborne law enforcement.

Brexit Moving Forward
Ironically, now that the vote is over and the Brexiteers have won, the “Remain” camp is gaining ground. For the first time since British newspaper The Independent and research firm BMG Research started polling UK residents for their opinion on Brexit, those who wish to remain with the EU are in the majority.

According to the most recent December 2017 figures, the so-called Remainers are now 10 percentage points in the lead over the Brexiteers. More than half of the 1,400 people asked by the researchers said they’d prefer to stick with the EU, up from 45 percent in November.

The result of the Brexit vote was traumatic at first. In April 2017, Tory Prime Minister Theresa May formally delivered her exit letter to EU President Donald Tusk, invoking Article 50, the provision in the EU Lisbon Treaty that outlines the steps to be taken by a country seeking to leave the union. European Commission President Jean-Claude Juncker proclaimed that Brexit “is a failure and a tragedy.”

Will there be another referendum? Don’t bet on it. The British government has shut down any speculation that there might be a revote on whether the United Kingdom should leave the EU. It’s also worth noting that those who didn’t cast their vote in the 2016 referendum are the majority of those leaning toward remaining. It’s too late; they should have spoken up when they had the chance. Most British citizens who actually voted for or against are unchanged in their views.
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Hard vs. Soft Brexit

Certain industries in Britain will indeed bear the brunt of Brexit. In particular, London could lose its status as the financial trading center of Europe. Frankfurt will likely gain a big slice of London’s banking, cementing Germany’s economic dominance of Europe. New York City also benefits; deregulation enhances its allure.

But for helicopter operators and manufacturers, the picture remains bright overseas. Growth across the globe is now synchronized, which means developed and developing countries alike are thriving. The bull market in global equities is likely to enter 2018 alive and well.

European traders in December 2017 welcomed news of progress in the Brexit talks, where UK and EU officials are hammering out the terms for Britain’s exit. The EU is the second-largest economy in the world if viewed as a single country. Without a favorable deal, British firms (and that includes those in the helicopter industry) would be stranded outside the single market.

To be sure, Brexit will have a negative impact on Britain’s £229 billion annual trade with the EU. An advantage of EU membership is free trade among member nations, which makes exporting goods to EU countries easier for British companies. Once Britain leaves the EU, trade barriers will rise.

A “hard” Brexit (that is, a Brexit conducted on the strictest terms, with Britain retaining no special relationship with EU countries) means that Britain would lose free trade with Europe, as well as all trade deals and treaties that the EU has negotiated with other nations. Britain would be compelled to operate under World Trade Organization rules. That would mean higher tariffs on imports to Britain, which would translate into higher prices for manufactured goods such as helicopters.

Brexit also could result in UK business aviation operators abandoning British aviation registries and aircraft operator certificates in favor of their EU counterparts. This would enable them to take advantage of more streamlined and favorable regulatory oversight, as well as cross-border simplicity.

At first, Brexit talks were rocky. But much to the relief of the helicopter industry, British and EU leaders expressed comity in mid-December 2017. Downing Street said the “divorce bill” would amount to about £39 billion, a figure both sides can live with. The European Commission president called it a “breakthrough.” European stocks rallied.

A “soft” Brexit, where Britain retains some ties to the EU, is becoming more likely. That’s good news for the helicopter business.

“How will Brexit affect the helicopter business? There’s no data on this right now, and no certainties either,” says Richard Aboulafia, vice president of analysis at the Teal Group, an aerospace consultancy based in Fairfax, Virginia. “The civilian helicopter industry is optimistic that it
Aboulafia says the biggest question mark looms over the world’s biggest civilian helicopter sector: energy transport. “There are two big oil and gas markets in Europe, and in a strange quirk of history, one of them — Norway — isn’t an EU member, and in a few years, the other one — Britain — won’t be, either. That’s why makers of civilian helicopters for offshore oil and gas transport are largely unconcerned.” However, Aboulafia notes that the financing of large oil and gas machines might be complicated by Brexit. We don’t know how the financiers of helicopter deals will react, and how it will change where they are based.

Another complication is Leonardo. In 2016, Leonardo-Finmeccanica became a single industrial company by integrating the activities of its subsidiaries AgustaWestland, Alenia Aermacchi, DRS Technologies, Selex ES, Oto Melara, and WASS. The former AgustaWestland is now a 50 percent EU company. It might shift more work to Italy as a reaction to Brexit, especially since Britain is leaning away from giving preference to local assembly.

As Aboulafia puts it: “A lot depends on the deal that is ultimately cut for Brexit. But right now, it appears that the UK is willing to pay more to make it easier for people. That implies minimal disruption to the helicopter industry.”

Implications for Manufacturers and Operators

Initial impressions that the helicopter industry is optimistic about Brexit are borne out by the latest polling data. A recent survey conducted by Helitech International found that the rotorcraft industry is largely unconcerned about the effects of Brexit. More than half of respondents said they believe Brexit won’t affect their business at all, while 30 percent believe it will have a direct effect. The rest are undecided.

Brexit will initially depress the revenue and earnings of Europe-based corporations and add stresses to the European financial system. But Europe is growing robustly, and economic tailwinds on the Continent should overcome the temporary challenges of Brexit.

European- and American-based helicopter makers see no lasting damage from Brexit on demand for their products and their bottom lines, other than the current uncertainty and additional hassles of sorting through the regulations. The civilian helicopter business is booming, and Brexit is unlikely to change that.

But while overall demand for helicopters won’t diminish, one possible consequence of Brexit is that European-based helicopter customers will become more insular and choose indigenous manufacturers of helicopters and related parts from countries that are EU members, rather than British-based companies. This dynamic could depress demand for UK-based companies such as engine maker Rolls-Royce.

Andrew Drwiega says much remains unknown about Brexit’s potential effects on civilian rotorcraft. A British citizen and long-time helicopter expert, Drwiega currently serves as an aerospace editor at Media Transasia Thailand. He formerly served as an editor at Aviation Maintenance and Rotor & Wing magazines. From his perspective, the crux of the Brexit issue is employment laws.

“We have yet to see what impact Brexit might have on employment laws regarding European helicopter pilots working in the UK and British pilots working in Europe, especially if that work is across one or more countries,” Drwiega says. “This could also impact engineers and maintainers, especially Europeans working in the UK if salaries do not keep pace with those in Europe.”

Drwiega doesn’t see much dislocation as far as regulatory bodies are concerned. But he says Leonardo may seize Brexit as an excuse to cease making helicopters in expensive, labor-intensive England.

“It is difficult to visualize the UK civil aviation industry operating outside the European Aviation Safety Agency,” he says. “Brexit and Leonardo’s own financial woes might give Leonardo, the UK’s last remaining volume helicopter manufacturer, the excuse that some industry observers say it has sought to cease helicopter manufacturing at its plant in Yeovil, England. The
option of turning the factory into an MRO [maintenance, repair, overhaul] and training facility after AW159 manufacturing has been completed must have been contemplated by the company.”

Richard Aboulafia closely observes European aviation regulations and regulators, particularly in Britain, which boasts a large and storied aerospace industry. Aboulafia commented about a potentially nettlesome problem: how Brexit will affect British helicopter and fixed-wing operators and the country’s aviation regulator, the Civil Aviation Authority (CAA).

Aboulafia says regulators will likely smooth over post-Brexit contradictions and gaps for airplanes and rotorcraft. “After Brexit, helicopter operators in the UK will need to obtain licenses and other approvals and permissions under the requirements of UK law, which is known as the Air Navigation Order [ANO], rather than under European Union law, as is presently the case,” he explains.

EU aviation laws and regulations are promulgated and enforced by the European Aviation Safety Agency (EASA). Aboulafia noted that the CAA still hasn’t published a plan of action for Brexit. However, he thinks any disruption from Brexit on aviation will be minimal.

“I expect the UK’s CAA to adopt current EASA requirements by simply replicating the requirements as a Civil Aviation Publication and referring to these in the ANO,” he says. He adds that this transition is unlikely to impose new and significant burdens on civilian helicopter operators.

One Sector Looking Up

One clear positive development from Brexit already is kicking in: charter and air tour operators in Britain are reporting booming business, as more corporate customers demand business charter flights and site tours across the country.

As deals are initiated or renegotiated because of Brexit, helicopter transport companies are busily flying executives around Britain and the Continent. Paradoxically, international deal-making is enjoying a “Brexit boost,” and that is generating helicopter demand.

It’s a reminder that money knows no borders, especially in aviation. R

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John Persinos is managing editor of Personal Finance and chief investment strategist of Breakthrough Tech Profits. He is also an analyst at the Teal Group aerospace consultancy. Persinos has received numerous journalistic awards, including the Royal Aeronautical Society’s Aerospace Journalist of the Year Award in 2001 for his work as editor-in-chief of Rotor & Wing magazine. He served as editor-in-chief of Aviation Maintenance magazine and publisher of the website Aviation Today.com, and also attended the Bell Helicopter Training Academy. Contact him at johnpersinos5@gmail.com.

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My mind was racing. I can still remember the sick feeling in my stomach as I arrived at the scene of our downed H130. I had just received word that one of our aircraft carrying our pilot and seven passengers had experienced a catastrophic bird strike. The initial report was that the aircraft was inoperable and that emergency medical crews were en route. I had no idea what to expect.

As I approached the aircraft, I stopped short. My heart sank as I noticed blood streaked across the broken windshield and spattered throughout the interior. I was amazed that a bird strike could cause such catastrophic damage. A helicopter air ambulance (HAA) crew had just arrived, quickly ushering a passenger onto their aircraft for medevac. This was the moment that permanently changed the way I viewed bird strikes and convinced me that something had to change.

Based in Las Vegas, Maverick Helicopters is one of the world’s largest helicopter tour operators. Our fleet of 47 helicopters offers scenic flights of the Grand Canyon, Valley of Fire, the Las Vegas Strip, and the Hawaiian island of Maui.

Maverick has been consistently recognized as a leader in aviation safety, having recently been awarded the FAA’s prestigious honor, the Diamond Award, for our dedication to maintenance, training, and aircraft safety. Despite maintaining the highest commitment to safety, our company faced a recurring and serious problem with bird strikes — including six major, near‑fatal incidents — between 1999 and 2009.

Bird Strikes on the Rise
Maverick is not alone in dealing with the growing threat of bird strikes. According to the FAA, bird strikes to helicopters have increased more than 700 percent since the early 2000s. Additionally, Helicopter Association International reports that air medical services are now reporting an average of one bird strike every week — and the problem is getting worse. The US Fish and Wildlife Service has warned the rotorcraft industry that the Canada goose population in North America increased from 500,000 in 1980 to more than 3.8 million in 2017. During the same period, the snow goose population increased from 2.1 million to 6.6 million.

Our Wake-Up Calls
In 2007 and 2009 our fleet sustained two near‑fatal bird strikes that served as frightening and effective wake‑up calls.

On August 27, 2007, a Maverick‑owned Airbus H130 helicopter struck an adult golden eagle while approaching Pearce Ferry Airport in Meadview, Arizona. The eagle hit the left‑center window post, fracturing it, and blowing out the center and left‑pilot windshield, and cracking the right windshield. The eagle continued upwards, striking and fracturing the upper window post above the pilot and continuing to hit the main rotor blades.

One portion of the eagle, the leg and thigh, entered the aircraft, striking the left‑center passenger in the face and scratching the pilot’s face. A second passenger in the right‑center seat sustained a laceration on her leg caused by broken windshield plastic, requiring stitches. The left‑center passenger sustained serious facial injuries and was flown by HAA to Las Vegas. Had the eagle struck the pilot, it would have most likely incapacitated him, causing a fatal accident for all eight people on board.

On August 8, 2009, a Maverick‑owned Airbus H130 helicopter struck an adult cormorant while leaving Las Vegas and approaching the Lake Mead National Recreation Area. The cormorant hit the left‑pilot upper doorpost, breaking the windshield. It then glanced off the door post and continued past the left...
side of the aircraft. Broken pieces of plastic lacerated the pilot’s chin, later requiring stitches. Similar to our first incident, had the cormorant struck the pilot, it would have most likely incapacitated him, causing a fatal accident to all eight people on board.

The two bird strikes alone cost Maverick more than $500,000 for aircraft damage repairs, lost revenue during suspended service, and medical care for our pilots and passengers.

Following these two near-fatal bird strikes, we realized our bird-strike problem needed to be solved. After the cormorant event, I truly feared the next bird strike would result in human fatalities. We had to do something to try to prevent it.

It is our practice to ensure that our operational safety standards exceed industry standards. After these incidents, Maverick was determined to find a solution to ensure the safety of our pilots and passengers.

**Airlines and Pulsing Lights**

In 2009, we delved into thorough research and investigation to find a solution. After reviewing data from large commercial aircraft operators and a US Department of Agriculture study, we learned about the proven safety benefits of pulsing the aircraft’s exterior lighting. Initially, the concept of pulsing the aircraft’s exterior lights seemed to be too simple a solution to significantly reduce the lethal threat of bird strikes. However, we quickly found extensive field data and supporting science that shows how pulsing lights maximize aircraft visibility and significantly reduce bird strikes.

The most extensive data reflecting the effectiveness of forward-facing pulsing lights comes from a three-year study by Qantas Airlines. Qantas conducted a long-range study of the system’s effectiveness.

Over a period of three years, Qantas conducted a test with its 737-400s and its 737-800s. In summary, the Qantas study concluded that the use of pulsing lights reduced its bird strikes by 30 percent on its 737-400s and 66 percent on its 737-800s.

Upon completion of the study, Qantas outfitted its entire Boeing 737 fleet with the Pulselite System, and it continues to install the system on its new aircraft. This definitely caught our attention.

The second major airline to modify its fleet with forward-facing pulsing lights was Alaska Airlines. According to the FAA and ICAO bird-strike databases (FAA: wildlife.faa.gov; ICAO: icao.int/IBIS), Alaska Airlines experienced a 33.5 percent decrease in bird strikes in the three years following its installation of the pulsing light controller, compared to the three years prior to installation.

More recently, the FAA conducted a study that resulted in an advisory on the danger of steady-state lights attracting birds and wildlife. The study confirmed the effectiveness of pulsing lights in deterring collisions with birds and wildlife.

**Pulselite for Helicopters**

We contacted Precise Flight, of Bend, Oregon, the manufacturer of the Pulselite System, to discuss outfitting our fleet. Precise Flight’s Pulselite System is the only FAA-certified

<table>
<thead>
<tr>
<th>Year</th>
<th>Before Pulsing Lights and Protocol</th>
<th>After Pulsing Lights and Protocol</th>
<th>Change</th>
<th>Change %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of Operation</td>
<td>10.5</td>
<td>8.0</td>
<td>(2.5)</td>
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<td>Flight hours</td>
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<tr>
<td>Near-fatal bird strikes</td>
<td>6</td>
<td>0</td>
<td>(6)</td>
<td>-100%</td>
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</tbody>
</table>

With pilot and crew thankfully safe on the ground, first aid was administered to the Maverick pilot’s facial lacerations before he received stitches.
onboard solution that can pulse an aircraft’s existing exterior lights. The Pulselite System is a lightweight electrical system controller that allows the pilot to pulse the exterior lights of the aircraft (similar to the alternately pulsing siren lights of a police car, ambulance, or fire truck).

Maverick Helicopters began installation of the Pulselite System onto our fleet of 34 Airbus H130 helicopters in 2009 and 2010. Between 2011 and 2017, we added 13 additional Airbus H130 helicopters, which were also equipped with the system. In addition, we internally adopted a standard operating protocol to engage pulsing lights at all times during operation of the aircraft.

Since installing the Pulselite System and implementing the pulsing protocol, Maverick has operated for eight years (285,000 flight hours) without experiencing a single major bird strike. Table 1 details our flight hours and bird strikes before and after implementation of pulsing landing and taxi lights and the new operating protocol.

During the past eight years, we have experienced an elimination of major bird strikes, which has provided an estimated $1.3 million in savings to Maverick. Our flight operations and flight paths remained consistent before and after our fleet modification. We therefore believe the elimination of near-fatal bird strikes to be the result of pulsing our landing and taxi lights.

As our colleagues in the rotorcraft community continue to share their bird-strike stories, we felt we had an important responsibility to share our company’s best practices with our peers in the industry. If this story helps save at least one life, it is valuable for us to share.

Best Practices and Lessons Learned
The Helicopter Safety Advisory Conference’s Recommended Practice for Bird Strike Avoidance states, “The use of pulse lights and or landing lights is recommended when operating in the vicinity of bird activity.” In addition, Flight Safety Foundation’s Basic Aviation Risk Standard for Offshore Helicopter Operations suggests that aircraft operating in a high-traffic risk environment should be fitted with pulsing lights.

At the 2016 North American Bird Strike Conference, Steve Jangelis, pilot for Delta Air Lines and chairman of the Safety Committee for the Air Line Pilots Association stated, “Pulsing exterior lights has been proven to reduce bird strikes, and it absolutely helps in collision avoidance by maximizing aircraft visibility. I support all technologies that increase flight safety, and pulsing exterior lights is an important one.”

In addition to decreasing bird strikes, we’ve found that alternately pulsing the landing and taxi lights of our aircraft increases visibility and decreases the risk of midair and ground collisions. When we conducted more industry research, we learned that for this reason, pulsing landing lights is a requirement for all U.S. Forest Service firefighting rotorcraft fleets. They are also installed on many law enforcement helicopters, HAAs, and U.S. Coast Guard helicopters.

Maverick Helicopters has learned the valuable lessons of bird-strike mitigation the hard and expensive way. After experiencing both the financial and emotional effects of bird strikes, we believe our success with pulsing the landing and taxi lights of our aircraft can help our colleagues in the rotorcraft industry save money and lives.

John Mandernach is vice president of maintenance for the Maverick Aviation Group. If you have questions or would like to speak to Maverick Helicopters for additional information, please call 702-261-0007 (main phone) or 702-303-5572 (direct phone), or email jmandernach@flymaverick.com.

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Sell It Faster and Get the Highest Resale Value

10 Tips for Selling Your Helicopter

By Mark V. Clancy

Selling a helicopter can be a daunting endeavor. High-value assets like these require more than just sticking a sign in the window and parking it on the corner. If you’ve ever sold an aircraft, chances are that you found it took a long time to get an offer. Getting a reasonable one took even longer. Here are some tips to ensure you get the value you want from your helicopter.

1. Take a Buyer’s Perspective

Thinking from the buyer’s perspective is often not a seller’s first inclination, but doing so will enable you to see your aircraft a bit differently. Reviewing the value proposition of your helicopter, making a detailed comparison with other helicopters on the market, and implementing improvements will undoubtedly increase resale opportunities.

2. Consider Improving Component Value

Too often, we see “down on component value” helicopters on the market. These are helicopters that have a substantial amount of retirement, overhaul, engine, and/or major inspections coming due in the near term. These maintenance expenses can range from 1 percent of the helicopter retail value to more than 30 percent, depending on the vintage, make and model, and condition.

This is a hurdle many buyers don’t want to jump. Commercial buyers who’ve been awarded a contract often don’t have the time to perform the maintenance and mission-equipment reconfiguration necessary to put a helicopter into commission. For private buyers, there are often concerns about spending above and beyond the helicopter purchase price, especially for maintenance items that carry latent risks that could be uncovered during an engine overhaul or a major airframe inspection.

Because of this concern, however, private buyers often overlook some very good helicopter acquisition opportunities. Wholesale buyers, such as dealers or lessors, are generally attracted to helicopters requiring substantial work scopes, but most sellers have retail price aspirations that are a challenge when there are so many helicopters for sale.

You’ll find that a minimal to moderate investment to ensure sufficient component and inspection time remaining for the next year or two will yield measurable value differential and attract more buyer interest.

3. Consider Exterior and Interior Refurbishments

Most pre-owned helicopters have been operated for years with the original or old paint that has faded and chipped. Or they have a unique or personal paint livery that doesn’t appeal to a wide audience of buyers. Likewise, interiors become dingy over the years, resulting in worn seats, old plastic, crazed glass, and other cosmetic defects.

New exterior paint and an interior refurbishment can make a big difference. A neutral, solid paint color (such as white), with new interior plastic, fresh seat cushions and covers, replacement glass, and new carpet with floor protectors make a helicopter look new again.

While these improvements may cost from $50,000 to $100,000 (depending on if it’s a single- or twin-engine helicopter) and take three to six weeks to perform, it’s an investment that will likely pay off. A neutral paint color also makes it easy for a buyer to apply custom striping or logos.

4. Invest in an Avionics Update

Depending on the year of manufacture and the likely buyer type, consider an
avionics update. The last few years have ushered in substantial avionics improvements and new airworthiness requirements such as ADS-B.

Consider removing unused or outdated mission equipment and installing a new nav/comm system, GPS, radio altimeter, ADS-B, and an updated audio panel. This type of upgrade can run from $20,000 to $60,000, depending on the helicopter, and take a few weeks, but it will enhance the aircraft’s functionality and longevity, while attracting consideration from more serious buyers. A knowledgeable broker or service center will know what avionics are likely to be valued by buyers and will provide you with specific recommendations to consider.

It’s likely that component value improvements, exterior and interior refurbishment, and avionics update will at least match the resale investment, save buyers considerable time, and pay dividends with an increased sales price and reduced resale period.

5. Have Complete, Accurate Documentation and Technical Records
One sure way to find yourself with a “no-buy-pre-buy” inspection is by having incomplete, disheveled, or inaccurate maintenance records. While most operators have a professional mechanic, engineer, or service center responsible for maintaining the helicopter records, we have seen too frequently varying degrees of completeness and accuracy with aircraft records.

Hiring an independent mechanic or engineer to conduct an audit of all aircraft maintenance records prior to putting the helicopter on the market will help ensure that the prepurchase inspection goes smoothly and doesn’t create an opportunity for buyers to negotiate the price down.

6. Stage Your Helicopter
Once all the maintenance, refurbishment, and upgrade work is completed, it’s time to commission professional photos of the exterior, cockpit, and interior. Grimy-looking photos taken in dark hangars or with dreary weather backgrounds, or grainy thumbnail images taken with low-quality phones or cameras make for a poor first impression.

Be sure your helicopter is clean. Choose an appropriate location with a scenic background, and take the photos on a blue-sky day. Get several photos of the exterior, cockpit, and interior.

Good photos make a strong impression on buyers. If you’ve made a substantial investment in an upgrade

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**Did You Know?**
Approximately 5.5 percent of single-engine turbine helicopters are available for sale, with an average of 667 days on market. Similarly, the twin-engine market encompasses 4.7 percent, with a slightly longer 673 days.

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and refurbishment of your helicopter, having a photographer or professional broker take a series of photos at an attractive venue on a nice day should yield some attention-grabbing images.

7. **Price the Helicopter Right**

One of the most challenging aspects of selling a helicopter is determining an appropriate asking price. Sellers are often influenced by book values more so than by market values, and they decide on a price without understanding the value comparisons.

Some sellers price using the “I don’t have to sell” mind-set and thus their asking price has no realistic market value basis. But more commonly, prices are specified as “make-oﬀer” in an effort of attracting buyer attention. This is not an effective approach.

The most effective way to establish an attractive market asking price is by first knowing the sales price of similar helicopters, then by making substantive value comparisons before settling on an asking price. Better yet, hire a helicopter appraiser or broker familiar with the make and model you’re selling.

8. **Relocate the Helicopter to a Buyer-Accessible Location**

Occasionally, helicopters are located in remote locations rather than in major metropolitan areas. This can be an issue for buyers. They often take into consideration how easy it will be to travel with their mechanic or pilot to inspect a helicopter.

Whether it’s operational or in long-term storage, consider relocating the aircraft to an easily accessible service center with trained mechanics and engineers who can provide maintenance, improvements, a records audit, or technical assistance. This can also be a convenient location where the helicopter can be prepared for postsale shipping transport or readied for a fly-away departure.

9. **Take Advantage of the Professional Broker Difference**

During a buyer’s market, such as the one we are now in, it becomes increasingly challenging to sell your own helicopter. Sellers often benefit by engaging a professional broker who is knowledgeable about the seller’s makes and models.

A good broker understands the current market, can perform detailed valuations, is able to recommend prudent presale work scopes, maintains a database of recent sales comparisons, knows how to market helicopters, and has an extensive network. In addition, developing a relationship with a professional broker provides an opportunity to gain market insights and recommendations about helicopter acquisitions and sales.

10. **Have a Resale Back-Up Plan**

If your helicopter is still on the market after an extended period, then it’s time to consider some alternatives.

If, at this point, you haven’t engaged a professional broker, now is the time. He or she can help you evaluate the situation, assess what has been done, and determine if any changes in approach would be appropriate.

Consider the possibility of offering the helicopter on a short- or medium-term lease. If your financial institution approves and you’re familiar with leasing, this may be a good alternative. Otherwise, you could contact a broker experienced with leasing who is able to offer marketing services to attract a credit-worthy lessee. If these aren’t attractive options, then be prepared to wait it out.

**Making Your Helicopter Attractive to Buyers**

With high-value assets like helicopters, getting the best price in a timely manner can be challenging. While the suggestions offered here are good general practices, the work scope solutions may not always be the best for all helicopters or seller situations. But by developing and implementing creative resale strategies that ensure helicopters are “ready-to-go,” have differentiated value, and are priced right, you can expect to receive an optimum market price and sell your helicopter in a relatively short period of time.
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On a cold, brisk December day, the sound of a Bell UH-1H Huey helicopter filled the sky over Marine Corps Base Quantico in Virginia. While the sound of the venerable 70s-era helicopter is routine around a military installation, the flight itself was a glimpse into the future of rotary-wing aircraft.

Taking part in a demonstration before the media and US Department of Defense officials, the autonomous helicopter flew three “missions” without any direction from the pilot, who was aboard only as a safety measure. While the military currently envisions using the autonomously operated aircraft for logistics-related missions in combat theaters, it is likely that commercial applications will follow.

The Future of Helicopters
Aurora Flight Sciences, working with the US Marine Corps and the Office of Naval Research (ONR), touted the demonstration flight as an example of its new Autonomous Aerial Cargo/Utility System (AACUS), which the company asserts will make any helicopter completely autonomous. The Manassas, Virginia–based company has been a leader in engineering products for the rapidly developing unmanned aircraft systems market.

The Marine Corps and Aurora Flight Sciences initially envision the autonomous helicopters working to support troops in the battlefield requiring resupply, and the three demonstration flights were designed to test that scenario. This resupply structure would free manned aircraft to support combat missions or other flights where human decision-making elements remain necessary.

“This is more than just an unmanned helicopter,” said Dr. Walter Jones, ONR executive director, addressing the group gathered for the demonstration. “AACUS is an autonomy kit that can be placed on any rotary-wing platform and provide it with an autonomous capability. Imagine a Marine Corps unit deployed in a remote location, in rough terrain, needing ammunition, water, batteries, or even blood.

“With AACUS, an unmanned helicopter takes the supplies from the base, picks out the optimal route and best landing site closest to the warfighters, lands, and returns to base once the resupply is complete — all with the single touch of a handheld tablet,” said Jones.

The Marines are also looking forward to adapting this emerging technology with their equally advanced personnel in mind. “We’ve developed this great capability ahead of requirements, and it’s up to us to determine how to use it,” Lt. Gen. Robert Walsh, commanding general, Marine Corps Combat Development Command, told the crowd. “The young marines today have grown up in a tech-savvy society, which is an advantage. We’ve got to keep pushing and moving this technology forward.”

Optional Equipment: The Pilot
Aurora Flight Sciences envisions that some of the autonomous aircraft would carry a pilot. This would allow the Marines or other users to expand the mission envelope as required. For example, the pilot could disengage the system to redirect supplies where they
are more urgently needed, or switch to a search-and-rescue mission, should the need arise.

“AACUS gives revolutionary capability to our fleet and force,” says Dennis Baker, AACUS program manager. “It can be used as a pilot aid to operate in GPS- and communications-denied arenas, or allow fully autonomous flights in contested environments, keeping our pilots and crews out of harm’s way.”

Aurora Flight Sciences equipped the helicopter with a variety of laser-guided LiDAR sensors and cameras running from nose to tail. At this stage of development, the electronics package required for communications, guidance, and flight operations is roughly the size of a large suitcase, although spokesmen for Aurora Flight Sciences project a smaller final version. According to the presentation at the demonstration, sensor size, weight, and capability can be scaled to match aircraft size and speed.

Once it is ready for its mission, the AACUS-equipped helicopter is capable of planning and following its own flight path to the designated landing zone (LZ), correcting to avoid obstacles such as other aircraft, towers, wires, and objects within the LZ.

The safety pilot onboard the autonomous aircraft for the demonstration flights was Jason Jewell, project test pilot for Aurora Flight Services. At this point in the technology, the pilot is still required to participate in the flight and mission. “First, I start the computer and leave it running for the day,” says Jewell. “For each mission, I coordinate with the ground operator. He sends the mission, and he tells me when he’s happy with the route and ready to launch.”

“I then throttle the aircraft up to full RPM. Then I arm the AACUS system and engage it,” continues Jewell. “It’s a two-step process, so there’s no question as to whether it’s engaged or not. Then I get back on the radio to let the controller know that he’s clear to launch. He presses the launch command, and at that point the aircraft is off. I don’t have to touch the flight controls except when the aircraft is on the ground.”

The Demonstration Flights

According to Aurora Flight Sciences, after a short training course, anyone can use an app on any hand-held device to order needed supplies and then direct the helicopter to fly to their position. For the demonstrations, Aurora Flight Sciences provided Marine Sgt. Dionte Jones with 15 to 30 minutes of training on the app. Using a small tablet computer, Jones then called for the aircraft from a point several miles away, ordering it to make three supply runs to different locations before landing it in an LZ located among several buildings.

In a real-world scenario, logistic coordinators at a staging area would conduct the load calculations of the resupply helicopter, factoring in the altitude temperature and lifting capacity of the aircraft. Crews would then load the supplies onto the aircraft, or into sling loads, making sure they met the center-of-gravity requirements for the helicopter.

During a span of about an hour, the autonomous Huey flew the three resupply missions under different scenarios, including one where marines specifically left a cargo container in the middle of the LZ. As the helicopter approached the LZ, it detected the obstacle and adjusted its landing site accordingly. The marine controlling the app can also “wave-off” the helicopter if required.

AACUS can also recognize and adjust for unsafe landing sites such as sloped terrain, mud, or water. The aircraft will continue to search for a suitable landing point, up to limits established by the controller. “That’s something we get to define,” adds Jewell. “For today’s demonstration, we established a 50-meter radius. So if it (AACUS) can find enough space in that 50-meter radius to put the helicopter in, it will.”

“One of the unique things about this is that you can send the aircraft to land anywhere, and bring the survey capability with you,” says Jewell. “Some systems require a surveyed landing point or runway, and that’s not the case with our system. You can give it the grid coordinate, and it will bring the survey capability with it to
find the safest spot to land.

“If you were to put the landing point in the middle of the forest and it was all trees, it would wave off” continues Jewell. “It would do that a number of times and then say ‘This is an impossible landing zone’ and then move onto the next landing zone.”

Although the platform for the demonstration was a Bell product, future demonstration flights may include helicopters from Boeing, which acquired Aurora Flight Sciences in late 2017 as part of a plan to increase Boeing’s presence in the field of unmanned aircraft. Previously, Aurora Flight Sciences had partnered with Boeing on other commercial and military projects.

“The combined strength and innovation of our teams will advance the development of autonomy for our commercial and military systems,” said Greg Hyslop, chief technology officer and senior vice president of Boeing Engineering, Test and Technology, in an October press release from Boeing. “Together, these talented teams will open new markets with transformational technologies.”

While the demonstration flights focused on military applications, Aurora Flight Sciences foresees the technology moving into the civil helicopter market. Since the day’s discussions centered on logistic support, examples for the civil market included support of offshore or onshore petroleum sites and firefighting. Some witnesses of the demonstration also speculated about adapting the technology to eventually carry passengers who would control the flight using a similar app.

**The Future for Pilots**

Is this the end of the career path for helicopter pilots? Jewell wasn’t ready to write off his profession. “I would still recommend this profession because I don’t see this as a zero-sum game. I see this more as a tool in a toolbox that we’re going to use for some dull, dirty, or dangerous missions. This would mean the trained pilots wouldn’t have to use their considerable skills for routine missions or put their lives at risk.”

Jewell, who is a Marine Reserve Bell Boeing V-22 Osprey pilot and a Naval Test Pilot School graduate, also elaborated on safety. “In my side gig with the Marine Reserves, I fly the V-22, and we sometimes have hard landings. Why do we have hard landings? Because it’s difficult to land in the dust at night. If an aviator has something that will help him do that safely, he’ll take advantage of it.

“What you saw today is a Vietnam-era aircraft with cutting-edge autopilot and pathfinding technology on it,” finishes Jewell. “It’s great to work on a program that I think will save lives someday when it makes it to the battlefield.”

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Dan Sweet is HAI's director of public relations and communications. Dan can be reached at dan.sweet@rotor.org.
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Setting the Standard in Safety

Beijing Capital Helicopter: China’s First Accredited Helicopter Operation

By Jenna Scafuri

In the helicopter industry, safety is the first priority. But with so many different types of operators and missions, how can we ensure that there is an equivalent level of safety across the board?

The HAI Accreditation Program of Safety (HAI-APS) is one way helicopter operators can maintain a high standard of safety. In September 2017, Beijing Capital Helicopter (BCH) became the first accredited helicopter operation in China, as well as the first international operator to earn HAI accreditation.

Industry Trendsetters

An affiliate of Hainan Airlines Group (HNA), China’s fourth-largest airline, BCH offers charter flights, aerial tours, business transportation, aerial prospecting, and medical airlift via its fleet of Airbus helicopters, including four H125s and three H135s. One of China’s leading integrated helicopter service providers, BCH has expanded its Eurocopter-built rotorcraft inventory with the addition of a VIP-configured Airbus EC135 P2+ for passenger transport and tourism missions.

Since its creation in 2011, BCH’s commitment to safety and professionalism has led to further expansion of its rotary-wing services. The company now offers maintenance services to operators and a growing base of customers in the northern China region via its service center located within the Beijing Badaling Airport.

In September 2017, BCH became the first international operator to undergo an HAI-APS audit. Even though BCH already was operating at a high level of safety, company management recognized that there is always room for improvement.

BCH was interested in being a leader in Chinese aviation as helicopter operations expanded, and saw HAI-APS accreditation as an opportunity to set the standard in the industry. They were eager to become trendsetters in safety.

“We pursued accreditation to not only enhance our level of safety, but also to raise the standard of operations in China,” says Wang Lejun, BCH safety director. “HAI-APS helped us reach that goal. Through the audit process, we gained the tools we needed to succeed. This is a milestone for Chinese general aviation — we’re making history.”

Getting Started

BCH’s road to accreditation started with a phone call to HAI headquarters. Wang Xinyu, president of BCH, was interested in accreditation after a visit to HAI earlier in the year. From there, HAI Director of Safety Steve Sparks advised him of the necessary steps to become accredited, which included:

- Purchasing the IS-BAO and Helicopter Mission-Specific Standards (HMSS)
- Conducting a gap analysis
- Revising and developing existing policies to meet IS-BAO and HMSS standards
- Preparing for the audit by reviewing the audit questionnaire
- Undergoing the audit.

“One of the biggest challenges in the beginning of the process was the language barrier,” says Bill Payne, the auditor who conducted the BCH audit. In order to conduct an audit, all of BCH’s manuals first had to be translated into English.

While the translated manuals offered most of the required information, there were still times when clarification was needed. “However, I was very impressed with
the BCH team’s command of the English language on-site,” Payne says. “Once we were there, everything went smoothly from a communications perspective.”

**Demonstrated Professionalism**

During the four days of BCH’s on-site audit, Sparks and Payne were impressed by the quality of its operations. Professionalism was evident in everything from its maintenance operation to its mentoring program — all of which exemplified BCH’s safety culture.

**Safety Culture**

As the audit team walked into BCH’s facilities, housed on the 11th floor of HNA corporate headquarters in Beijing, it was clear that safety was ingrained in the culture of the entire organization. BCH’s helicopter operations are modeled after its airline parent company, HNA. BCH processes and procedures mirror a FAR Part 121 operation. With the backing of one of the largest airlines in the country, safety culture is a priority for BCH.

“Safety is very important to this company, and they take it seriously,” says Payne. The organizational structure reflected this. “There is a separate general safety manager who

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**Why Accredit?**

HAI-APS is a voluntary program that helps helicopter operators reduce accident and incident rates by improving their safety cultures. HAI-APS utilizes the International Standard for Business Aircraft Operations (IS-BAO) as its foundation, then builds upon IS-BAO standards to provide the Helicopter Mission-Specific Standards (HMSS) that address specific rotary-wing operating operational environments. They include safety standards customized to 13 different helicopter mission segments, such as air tour operations, helicopter air ambulance, and offshore operations.

There are thousands of personal, corporate, and commercial helicopter operators, but only a few ways to discern which operator is safer than another. Every operator must meet the “minimum level of safety” established by its regulatory authority, but not every operator has adopted policies and procedures to ensure it conducts business at a higher level of safety.

The HAI-APS allows an operator to demonstrate to an independent third party auditor that not only does it incorporate minimum state regulatory standards for a given operation, but it also:

- Meets or exceeds a recognized international helicopter standard
- Has adopted industry best practices in one or more of 13 unique HAI-APS mission specialties
- Has enhanced operational safety through predictive and proactive methods
- Has an improved, or just, safety culture
- Has improved efficiency through an effective safety management system
- Has an enhanced ability to measure safety performance
- Has executive-level participation in aircraft maintenance and operations.

By being HAI-APS accredited, operators can set themselves apart from their competition and foster a safer helicopter industry. This is exactly what BCH did.
OVERSEES THE SAFETY PROGRAM, THEN SAFETY MANAGERS IN EACH OF THE VARIOUS DEPARTMENTS SUCH AS MAINTENANCE, AND FLIGHT AND OPERATIONAL CONTROL.”

BUT THE SAFETY MANAGERS ARE NOT THE ONLY ONES DRIVING THE CULTURE. “THE SAFETY MANAGEMENT SYSTEM [SMS] IS WELL MANAGED AND FULLY EMBRACED BY ALL COMPANY EMPLOYEES,” SAYS PAYNE. “THEIR EMPLOYEES ARE ENGAGED IN THE REPORTING PROCESS. THE DEPARTMENT IDENTIFIES FIVE SAFETY TARGETS EACH YEAR AND STRIVES TO REACH THOSE GOALS.” ALL THE EMPLOYEES PAYNE MET WERE VERY INVOLVED IN THE SMS AND EAGER TO SHARE THEIR IDEAS AND ENTHUSIASM FOR THE PROCESS.

MAINTENANCE

BCH SAFETY DIRECTOR WANG LEJUN ALSO HAS A MAINTENANCE BACKGROUND. THIS BLEND OF EXPERIENCE IS UNIQUE TO THIS POSITION, AS SAFETY DIRECTORS ARE MORE COMMONLY PILOT OR OPERATIONS ORIENTED. PAYNE AND SPARKS BELIEVE THAT WANG’S DEPTH OF EXPERIENCE IN SAFETY AND MAINTENANCE CONTRIBUTED TO BCH’S EXCELLENT PERFORMANCE IN MAINTENANCE SAFETY PRACTICES. WANG’S BACKGROUND IS BENEFICIAL WHEN IT COMES TO SAFETY AND MAINTENANCE THROUGHOUT THE ORGANIZATION.

“IT IS OBVIOUS THAT BCH HAS SPENT THE LAST TWO YEARS CONFORMING THEIR MAINTENANCE PROGRAM AND PRACTICES TO THE REQUIREMENTS IN THE IS-BAO STANDARD,” PAYNE SAYS. “THEIR MANUALS ARE PRECISE, COMPLETE, AND WELL ORGANIZED.” SPARKS AGREED, “BCH HAS A FIRST-CLASS MAINTENANCE RECORD. THEY HAVE REALLY SET THE BAR.”

AS AN AUTHORIZED SERVICE CENTER FOR AIRBUS, MAINTENANCE FOR BOTH INTERNAL AND EXTERNAL CLIENTS IS AN IMPORTANT PART OF BCH’S OPERATION. THE AUDIT TEAM WAS PARTICULARLY IMPRESSED WITH BCH’S PARTS INVENTORY CONTROL. “DOCUMENTATION OF THE PARTS INVENTORY WAS VISIBLY IMPRESSIVE,” SAYS SPARKS. “BCH UTILIZES A ROBUST TRACKING SYSTEM FOR MANAGING AND CONTROLLING ITS PARTS INVENTORY. BASED ON A CHECK-AND-BALANCE APPROACH, THIS SYSTEM IS VERY INTUITIVE FOR HELPING MAINTENANCE PERSONNEL TO ACCURATELY TRACE WHEN AND WHAT PARTS ARE USED, FOR ENSURING QUALITY CONTROL.”


MENTORING

BCH RECOGNIZES THE IMPORTANCE OF INVESTING IN AND TRAINING ITS YOUNGER GENERATION OF PILOTS. THROUGH ITS MENTORING PROGRAM, EXPERIENCED PILOTS ARE MATCHED WITH LESS EXPERIENCED PILOTS DURING TRAINING FOR A MORE PERSONAL LEARNING EXPERIENCE. “I WAS IMPRESSED WITH THE WAY EVERYONE WORKED TOGETHER AND LEARNED FROM EACH OTHER,” SAYS SPARKS. “IT’S A GREAT OPPORTUNITY FOR THE PILOTS WITH MORE HOURS ON THE JOB TO

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impart practical wisdom to those with fewer hours.”

“At first, I was surprised to see that a lot of the staff were younger, which is different from many operations in the United States,” Payne says. But it became clear that the mentoring system bolsters an environment of learning and cooperation.

Tour Operations
BCH is the only helicopter operation authorized to do aerial tours of the Great Wall of China. While on-site, Sparks and Payne got to experience the tour firsthand.

The first thing that stood out to the pair about the BCH tour operation was the level of security at the airport. While there is virtually no security at general aviation airports in the United States, there was a full screening process to get onto the ramp at Beijing Badaling Airport. “There was very tight control of airport access,” Sparks says. Passports and IDs had to be scanned before they were allowed access. This access control is a vital part of BCH security.

Once Sparks and Payne were through security, BCH had ground handlers ready to help them get in the helicopter and get buckled. These ground handlers also provided safety instructions, such as staying away from the tail rotor, that the average civilian passenger might not know.

“They were also there to help us exit the helicopter,” Sparks says. “It was clear that they wanted to provide the safest environment possible for passengers.”

While most tour operations in the United States only use one pilot, BCH tours operate with two. With two pilots, one can stay focused on the flight, while the other can interact with passengers or highlight points of interest below. “This is a great safety practice from a crew resource management perspective,” Sparks says. “With two minds instead of one, it elevates safety through increased situational awareness.”

Follow Their Lead
It is clear that BCH has achieved its goal of being a safety trendsetter in the industry. “BCH’s safety program is very well formulated and documented.” Sparks concluded. “It set the stage for their leadership to develop a culture that aspires to a high standard of safety.” That’s exactly what HAI-APS strives to achieve.

To become an HAI-APS accredited operator, you’ll need to demonstrate that your operations are in compliance with internationally accepted standards of safety and professionalism for helicopter operations. To learn more about the process, visit hai-aps.rotor.org or email hai-aps@rotor.org.
Delta Air Lines is offering opportunities for travel discounts for HAI HELI-EXPO 2018. Use Meeting Event Code NMRMM for discounts on round-trip flights to and from Las Vegas, February 22–March 6, 2018.

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To find out if your Expo trip is eligible for discounts:
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Your Mission, Our Mission: KEEP THE ROTORS TURNING
What makes a great helicopter photo? Take a look: we have six examples for you in our showcase of the photo winners of the 2018 ROTOR Photo and Video Contest. You can view our video winners at contest.rotor.org.

Thank you to all of the contest entrants — we appreciate each one of the photos you shared with us. We received hundreds of photos this year, and these stood out above the rest.

Even if your photo doesn’t appear in this issue, you may see your entry as a Last Word in future issues of ROTOR or as the pick for Today’s Photo in ROTOR Daily, our e-newsletter (if you aren’t already receiving ROTOR Daily, you can subscribe free of charge at rotor.org/subscribe).

Whether you’re here to see some compelling photography or you wanted to check out the competition, we hope you will participate in the 2019 ROTOR Photo and Video Contest. Submit your photos and videos at contest.rotor.org beginning August 1, 2018.

– Jenna Scafuri
Assistant Editor, ROTOR Magazine

PS: The 2019 ROTOR Magazine Photo and Video Contest will open in August. The rules are simple: every shot has to show all or part of a helicopter, and you have to own the photo or video. That’s it. Anyone can enter: HAI members, nonmembers, professional photographers, and amateur shooters.

You can submit photos in five categories:

- Helicopters at Work
- Helicopters Serving the Community
- Helicopters in the Military
- People and Their Helicopters
- Digitally Enhanced Photos/Videos.

The photographer and videographer who submits the overall winning photograph will receive $500; each category winner will receive $50.

Start submitting your favorite shots and videos at rotor.org/contest, beginning August 1, 2018!

Grand Prize Winner: ♦

MATTHEW HERBERG
Virginia, Minnesota, USA

In the Photographer’s Words

In May 2016, my mother was evacuated from her home in Embarrass, Minnesota, due to a wildfire. This Bell 206B, owned by Brainerd Helicopter Service, was relentless in delivering water back and forth to the fire. Because of this pilot’s effort, the flames were pushed back and my mother’s home was saved from being destroyed.
Category Winner:
Helicopters at Work

STEVE LEWIS
Mojave, California, USA

In the Photographer’s Words
This photo shows the National Test Pilot School’s (NTPS) Experimental B212/UH-1N twin-engine Huey during a tethered-hover student exercise designed to simulate various gross weights of the aircraft for hover-performance testing. The photo was taken directly under the aircraft from the perspective of the tie-down, utilizing a remote camera. This aircraft previously served with the Canadian Armed Forces.
Category Winner: Helicopters in the Military

RYAN MATTSON
Puyallup, Washington, USA

In the Photographer’s Words
American infantry soldiers head to a Chinook after a field-training mission in Oregon.
Category Winner: Helicopters Serving the Community

MICHAEL STONE
Fort Lauderdale, Florida, USA

In the Photographer’s Words
I am a lieutenant for Broward County (Fla.) Sheriff Fire Rescue. This photo of a Broward County Sheriff’s Office Eurocopter EC135 was taken overlooking Fort Lauderdale Beach.
Category Winner: People and Their Helicopters

SCOTT MOAK
Chesapeake, Virginia, USA

In the Photographer’s Words
This group photo of my detachment in the Black Sea off the coast of Russia was taken with a tripod and remote. It’s my favorite photo — I’m front and center.
**2018 ROTOR Magazine Photo Contest**

**Category Winner: Digitally Enhanced Photos**

**JACOB STRAUBE**

*Honolulu, Hawaii, USA*

*In the Photographer’s Words*

This photo was taken on November 17, 2017, on the island of Oahu at the Kalaeloa airport at sunset. I am an aircraft painter and run Straube’s Aircraft Services on the island of Oahu. It was the end of the day, and I had my crew detail the EC130 that we just painted for Blue Hawaiian Helicopters. Shortly after the aircraft was detailed, it started to rain. After I had locked up shop for the day, I noticed the sunset was very dramatic and there was a good-size puddle from the earlier rain. I grabbed my camera, placed it in the puddle balanced on my phone, put the timer on, and ran over next to the helicopter. It was perfect timing.
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The latest in helicopters, avionics, and technology await you at this year’s HAI HELI-EXPO® in Las Vegas. The 2018 event, which opens Monday, February 26, will be host to hundreds of business, networking, and learning opportunities planned just for you. The show floor will be open Tuesday, February 27, through Thursday, March 1.

Preliminary registration numbers for exhibitors and attendees have been impressive. “Both of these are positive indicators that our industry is on the upswing,” says Matt Zuccaro, president and CEO of HAI. “Having a big show is wonderful, but what this really means is that manufacturers, operators, and ancillary companies are poised and prepared for growth.”

Location, Location, Location
Visitors attending this year’s show in Las Vegas have one of the greatest variety of hotel options in any city. From the large casino hotels to the more practical business hotels, attendees are certain to find housing that matches their budget and lifestyle.

Registration will be in the Grand Lobby of the Las Vegas Convention Center, between Central and North Halls. Watch for our registration hosts, the “Rat Pack” as they guide you through registration, then have your picture taken with the world-famous “Welcome to Las Vegas” sign and share it on social media. #HAI_EXPO18 is our hashtag on both Twitter and Instagram.

For transportation around town, the Las Vegas Monorail stops right outside the Las Vegas Convention Center. In addition, from Monday, February 26, through Thursday, March 1, shuttle buses will deliver attendees to and from the convention from all but the closest hotels in the HAI HELI-EXPO housing block. You’ll find more information about schedules and routes at rotor.org/shuttle.

What’s Hot in Las Vegas?
Want to be the first to know about exclusive Expo giveaways, show floor surprises, and parties? The best way to navigate the show and be the first to know is through the HAI HELI-EXPO show app. This app displays event schedules, maps, exhibitor listings, and surprise “app-only” meetups and parties designed to improve your Las Vegas experience.

Search the iOS App or Google Play store for “Heli Expo” or download the app by scanning with your smartphone the QR code shown at left. There are literally hundreds of events, activities, and displays to fill your day.

Everyone’s a Winner!
Each year, HAI hears that networking is the No. 1 reason that people attend HAI HELI-EXPO. This is the one show that nearly everyone in the industry attends, so it’s easy to find old friends and make new connections.

Make your connection at this year’s HAI HELI-EXPO Welcome Reception (sponsored by Bell Helicopter) at Intrigue nightclub in the Wynn Las Vegas. This venue is one of the hottest in town, so make
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We invite you to visit us at the HAI HELI-EXPO in Las Vegas, February 27 – March 1 at booth #C6454.

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sure you take advantage of this unique networking opportunity.

You can also kick off your HAI HELI‑EXPO in the desert sunshine at the annual Helicopter Foundation International (HFI) Scholarship Golf Tournament held before the show officially opens, on Sunday, February 25, at the Las Vegas National Golf Course. The cost for 18 holes of golf, with cart and lunch, is $230 per golfer. Check‑in starts at 10:00 a.m., and the shotgun start is at noon. All tournament proceeds will fund HFI scholarships for students pursuing careers in rotorcraft aviation. You can find more information at rotor.org/golf.

Last year, we debuted a new feature on the HAI HELI‑EXPO show floor: HAI Connect, a place where attendees could connect with education, technology, and each other. This year we’ve positioned our HAI Connect pavilion right in the middle of the show floor, at Booth #C1350. You can’t miss it.

HAI Connect should be your go‑to location for industry news, industry meetups, and special events. Come to get updates on legislative events, career guidance, and face‑to‑face time with industry influencers.

We’re also hosting meetups at HAI Connect for those who share common professional interests. Pilots, maintenance personnel, and aerial firefighting are just some of the meetups that we have planned.

HAI Connect’s convenient location makes it easy to pop into these 10‑ to 20‑minute events. Be sure to check the show app and the show monitors often for updates.

If you are looking for a new job, visit the HFI Helicopter Industry Career Fair and the Career Roundtable, both on Tuesday, February 27. Located in Rooms N113 and N114, the Career Fair runs from 10:30 a.m. to 5:00 p.m. and features companies in the rotorcraft industry that are actively hiring new employees. The Helicopter Industry Career Fair is free for job seekers, but they must preregister. Companies interested in seeking qualified candidates for open positions can obtain 8‑foot x 8‑foot booth space for a nominal fee. To register as an exhibitor or job seeker, visit rotor.org/careerfair.

If you’re trying to figure out your next step on your career path, stop by the Career Roundtable in Room N111 from 1:00 p.m. to 3:00 p.m. This event for pilots and aircraft mechanics features industry professionals who can answer questions and share advice on keeping a career in the helicopter industry moving upward.

HAI Takes You to School
One of the most popular events at every HAI HELI‑EXPO are the safety education sessions available through the Rotor Safety Challenge, as well as the HAI Professional Education courses. These helicopter‑specific

sessions and courses are taught by industry experts, former HAI Salute to Excellence recipients, and safety professionals.

Twenty‑five courses fill this year’s HAI Professional Education schedule. Available for a fee that is separate from the HAI HELI‑EXPO registration, these classes support pilots, maintenance personnel, and administrative staff. The courses range in length from four hours to four days, and attendees receive a certificate of attendance. Some classes may be eligible for WINGS or AMT credits. You can find the complete schedule, class descriptions, and fees at rotor.org/takeacourse.

Because safety is such an important element of our industry, we are proud to once again offer the HFI Rotor Safety Challenge as an important part of our education lineup. These 50‑plus safety education sessions are available to all HAI HELI‑EXPO attendees and exhibitors at no charge. Most of the sessions last one hour, although a few are longer to cover their subject more thoroughly.

Attendees who attend a minimum of six sessions complete the Rotor Safety Challenge and receive a certificate of completion for their efforts. You can find a schedule and session descriptions at rotor.org/takethechallenge.

The HAI HELI‑EXPO Fly‑In/Fly‑Out
The Expo show floor is open from Tuesday, February 27, to Thursday, March 1, but official activities are under way as early as Friday, February 23. As booths begin to spring up from the show floor, approximately 60 helicopters will take their place under the bright lights, and most will arrive by air on February 23 and 24. Scheduled to arrive roughly every 15 minutes, this fly‑in is a must‑see event for aviation enthusiasts.

The aircraft depart the following Thursday and Friday, March 1 and 2, moving at a slightly faster pace than their arrival. Inbound and outbound flights are under the control of the FAA and HAI flight operations personnel, and safety is the top priority.
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Celebrating Our Industry’s Best
On the evening of Wednesday, February 28, the industry gathers to honor some of our best and brightest. For more than 50 years, HAI has recognized the outstanding achievements and exceptional merit of individuals and organizations in the international helicopter community through the annual Salute to Excellence Awards, presented in nine categories.

This annual awards dinner is the premier event of HAI HELI-EXPO. For tickets to this impressive event or for information on this year’s honorees, visit rotor.org/saluteawards.

A new segment at this year’s Salute to Excellence dinner is recognition of the many helicopter industry professionals who provided assistance in the aftermath of the myriad natural disasters that recently struck around the world. This includes wildfires, flooding, earthquakes, hurricanes, and other disasters where helicopter flight crews provided humanitarian service.

This part of the evening’s program does not replace the Salute to Excellence Humanitarian Service award. It simply recognizes the many other people who used helicopters to help those in need. If you were one of those who operated, flew, maintained, or supported the many helicopter emergency response missions during the past year, please join us to accept the recognition and gratitude of your peers in the industry.

Support the Past, Present, and Future
HFI has the mission to support helicopter safety, preserve and display the history of vertical flight, and promote the industry as a rewarding career. In order for HFI to produce a variety of programs at HAI HELI-EXPO 2018, such as the Rotor Safety Challenge and Helicopter Industry Career Fair, it sponsors two fund-raising events at HAI HELI-EXPO.

One, the HFI Scholarship Golf Tournament, serves as an informal kickoff to the show. The other, the HFI Online Silent Auction, is one of the last events on the show schedule.

The HFI Online Silent Auction reaches thousands of potential aviation enthusiasts and bidders. Please visit www.biddingforgood.com/HFI beginning Feb. 19; you’ll be able to register and bid 24/7 throughout the auction period.

Bidding closes at 4:00 p.m. PST on Thursday, March 1. Bidders do not need to be present in Las Vegas to win. Proceeds will go to HFI’s Scholarship Program for future pilots and mechanics, as well as to support HFI’s safety and historic preservation programs. More information can be found at rotor.org/auction.

The Future of HAI HELI-EXPO
Finally, get ready for Atlanta! ATL will be the next city to host HAI HELI-EXPO, so watch for updates and promotions for HAI HELI-EXPO 2019, March 4–7, with exhibits open March 5–7. Visit Booth #C1955 to learn more.
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See Voyager in action at HELI-EXPO 2018, Booth C2345, February 27th - March 1st.
For sports fans, watching a team work seamlessly together in their pursuit of victory can be magical. They often make extremely complex maneuvers look effortless as players interact with each other in ways that seems to confirm the presence of ESP or mind reading. But in fact, it takes years of practice to achieve these smooth, precise collaborations on the field, court, or course.

The players must pool their individual efforts to achieve a common goal. One player can’t do it alone. They must all work together to make the magic that happens when the team is greater than its individual members.

The Team
And so it is with helicopter operations — of any kind. Except we don’t work together to score points, we work together to complete a mission efficiently, effectively, and safely.

Complex helicopter air ambulance transfers can’t be completed safely without the seamless integration of the entire team. Each member of a helicopter logging crew must work together to reduce risk and complete the job. And members of a helicopter search-and-rescue team all contribute specific skills at specific times to accomplish the mission.

Every player on the field needs help from his or her teammates. Helicopter professionals, like the best sports teams, need great communication, situational awareness, and leadership to do their best work together and get the job done safely.

You are likely saying to yourself, Of course we work together as a crew to get the job done. But is each player merely doing his or her individual part, or are they also enabling others to do their best work? In volleyball, the best kill shot is enabled by the best set, which in turn is enabled by the best dig. Everyone has their own job, but they also enable the other people on the team to do their best.

The pilot can’t start the IV, just as the flight nurse can’t lift the aircraft from the landing zone. But these tasks are interrelated, and each person’s performance will affect the others.

Can the pilot enable a less-risky needlestick by changing altitude or airspeed? Can the flight nurse, doctor, or technician provide invaluable input on obstacle clearance when lifting from the scene? Absolutely. Could either of these tasks be completed without the help of the other team members? Probably. But complex tasks are most safely completed when the crew works together synergistically to minimize risk at every turn.

Communication
Communication is the bus that the crew coordination team rides in. Without it, the team is going nowhere.

Sports teams communicate by a variety of means. The baseball manager’s signs and the quarterback’s audible play calls on the field are vivid examples. In our industry, we communicate with team members by talking on the intercom or radio and using hand signals.

Direct verbal communication conveys a great deal of information, but voice tone and body language convey volumes of information as well. How well we read and react to those subtler (and perhaps more accurate) forms of communication can significantly enhance how well we work together as a crew.
Just as the basketball player with the ball must make a split-second decision about who to pass to based on the other players’ cues, we must use cues in voice and body language to support other members of the crew. Flight test crews (and their ground-based telemetry techs) must make instant decisions to continue or abort test points based on a host of complex parameters. They must also consider the comfort level of the crew in the aircraft based on subtle communications. Given the pressures of the job, this is no easy task, but it is critical to the safety of all involved.

Really good teams communicate through all channels — verbal and nonverbal — without hesitation. Don’t be afraid to ask for help, and don’t be afraid to offer help when you sense it is needed.

**Situational Awareness**

Situational awareness (SA) is the degree of accuracy by which perception mirrors reality. Football teams often try to fool their opponents by coming to the line of scrimmage with a formation designed to convey a false play. Flight crews are also often fooled by a false reality, such as wires that can’t be seen, higher temperature than anticipated, or an operating environment that is different than briefed.

Just as the opposing football team must react to the reality of the play as it unfolds, we must be aware of our situations as they unfold. The quarterback must make adjustments based on his read of the defense, and helicopter crews must make on-scene adjustments as necessary.

The key in both cases is to get the whole team to make those adjustments together. Here again, communication enables the situational awareness of the crew.

Every member of the crew holds a piece of the SA puzzle, even ground-based team members (such as a trooper in a car or ground-based dispatcher). Sharing that information helps build SA for all members and is vital. For example, relying on one person’s memory about obstacles that surround the aircraft prior to landing or takeoff is risky. Real-time SA is better when gathered by many sources and shared. The more accurate everyone’s picture of reality is, the better he or she can react to unfolding events.

**Leadership**

Leadership in helicopter aviation requires the ability to direct and coordinate the actions of the crew. Everyone in the crew is a leader at one point or another during any helicopter mission. The pilot may be the lead for the takeoff and transit flight, but a crew member may be the situational leader on the approach, based on better visibility of an obstacle.

The team member with the most expertise or awareness of the situation takes the lead and directs the actions of the entire crew, even if only for a little while. This situational leadership doesn’t depend on the seniority of the team member. The specific task leader may be the most junior person on the crew. So it pays to ensure that all members of the crew are able and qualified to take the lead at some point.

A team of mountain climbers would never take to the mountain without every team member knowing how to use a rope and ice axe. Everyone is hooked together and, at some point in a climb, every member of the team must be capable of exercising leadership and arresting a fall, saving everyone. Likewise, we should never get airborne without every team member understanding how to use their skills to lead the crew.

Everyone must know their specific role, as well as how to perform that role as part of a crew. This doesn’t mean that responsibility for the safety of the flight or the positional leadership changes. This temporary shift in situational leadership must be shared among members of the crew, but the designated leadership for the flight never changes. The pilot-in-command is generally that leader. But the best leaders share situational leadership and enable their team to do their best work.

**Safety for the Win**

For any helicopter operation, acting as a team and making good plays on the field can be a matter of life and death. But it doesn’t just happen.

To become a high-performing team takes practice and insight into how your teammates work and react. We, like the best sports teams, must practice good communications, share information to maintain SA, and take the lead when required to support the rest of the crew and win the safety trophy — every time we fly.

GO TEAM.

Dave Blair is the chief pilot for safety at Sikorsky Aircraft, responsible for enterprise-wide flight operations safety. Dave is a rotary-wing ATP and also holds fixed-wing commercial and instrument privileges. In addition to a master’s degree from The George Washington University, Dave attended the Naval Aviation Safety Officer’s course at the Naval Postgraduate School. He serves as an industry advisor to the HAI Safety Committee and is a member of the U.S. Helicopter Safety Team.
Looking to get involved in the future of the helicopter industry? Maybe you’re seeking professional development or new networking opportunities. In 2018, you’ll find them in Las Vegas.

Take advantage of HAI HELI-EXPO’s career development opportunities designed for helicopter industry professionals like you. Prepare for your next promotion and develop leadership skills by joining an HAI committee, or renew your IA certificate — you can choose from 50+ education and leadership opportunities. If it has to do with helicopters, you’ll find it at HAI HELI-EXPO 2018!

Sample 2018 Events
- Military to Civilian Workshop
- HFI Helicopter Industry Career Fair
- Air Medical Committee Meeting
- FAA Face to Face General Session
- Turbine Engine Hygiene
- Business of Managing Safety
- Annual DOI/USFS Interagency Fire Briefing

For more information on ALL the events planned for HAI HELI-EXPO 2018 in Las Vegas, visit the Events page at heliexpo.rotor.org
Is There a Looming Global Shortage of Helicopter Pilots?

By Matt Callan

The military and commercial fixed-wing communities are experiencing a critical pilot shortage. According to a 2011 International Civil Aviation Organization (ICAO) study, the commercial air transport industry will need to add 517,000 pilots by the year 2030.\(^1\)

In an article on Patrick Smith’s popular blog, Ask the Pilot, U.S. regional carriers, faced with a crippling shortage of pilots, have been bending over backwards to attract new hires — and to hang on to the pilots they already have. Salaries are soaring, and airlines are offering retention bonuses north of $30,000.

But even with those incentives, recruiting sufficient pilots is a challenge. A 2017 article in Fortune reported that Horizon Air canceled hundreds of flights, while SeaPort Airlines and Republic Airline filed for Chapter 11 bankruptcy, citing pilot shortages as a causal factor.

Of course, these incidents point to a shortage of fixed-wing pilots. What about the helicopter industry? Are we also facing a future where missions will be canceled or put on hold until pilots with the appropriate training and experience are available?

All Indicators Point to Yes

The military trained more helicopter pilots during Vietnam than any other time in military history to date. At the peak of the war, 575 pilots each month graduated from the US Army’s primary helicopter training at Fort Wolters, Texas.\(^4\)

Altogether, the Vietnam Helicopter Pilots Association estimates that more than 40,000 helicopter pilots served in that war. However, those Vietnam-era helicopter pilots are now either retired or retiring. Direct U.S. military involvement in the war ended in 1973, meaning that the youngest Vietnam-era pilots are now hovering around 65 years of age.

Kenny Keller, the founder of the Helicopter Online Ground School, writes that the retirement of many Vietnam-era pilots has created a shortage in the helicopter air ambulance [HAA] sector. Because of the challenges associated with the mission, that sector in particular requires highly experienced pilots, generally looking for those with more than 2,000 flight hours, instrument training, and turbine time. According to a friend of Keller, “At this time, [HAA operators] do not have enough qualified pilots.”

Looking for some hard data on the helicopter industry to back up this anecdotal evidence? Helicopter Foundation International (HFI),\(^5\)

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the charitable arm of HAI, has commissioned the University of North Dakota (UND) to conduct a study on staffing projections for rotorcraft pilots and mechanics. The study is scheduled to be completed at the end of March; more information about the study and follow-on work will be announced at HAI HELI-EXPO 2018 in Las Vegas.

**Next Generation of Aviation Professionals**

On November 27–28, 2017, I attended the Next Generation of Aviation Professionals (NGAP) Summit at the International Civil Aviation Organization (ICAO) headquarters in Montreal, Canada. The NGAP Summit brought together experts from government, industry, and academia to develop a strategy for meeting the demand for more aviation professionals. Discussions at NGAP recognized some of the inherent problems in attracting millennials to aviation careers.

**Aviation as a STEM Career**

Exposed to advanced technology from an early age, millennials are attracted to the careers in the STEM (science, technology, engineering, math) fields, both because they feel at ease in the technical environment and they see these jobs as growing and future oriented. As a result, many technical firms (think Apple, Samsung, Amazon, Microsoft) are recruiting young people right out of college before they can be introduced to aviation.

Yet piloting is by definition a technical career, and the modern cockpit is full of the latest technology. The helicopter industry needs to do a better job of demonstrating what pilots do, how they do it, and the rewards of the career. We also need to rebrand our industry as a STEM career and raise awareness of its opportunities among young people, educators, and others who promote STEM career opportunities and recruiting.

**Awareness of Our Industry**

Another roadblock to recruiting more young talent into helicopter aviation is that it’s simply not that well known or understood outside of our industry. How many people can tell you what general aviation (GA) is?

I hope that 100 percent of ROTOR readers would reply, correctly, that GA is all civil aviation outside of scheduled airline operations, but I doubt that many of the general population could define it. And if they can’t define it, they probably don’t know that it is a thriving segment of aviation that in the United States alone generated 1.1 million jobs and $219 billion in economic activity in 2013.

Even within aviation, our industry is sometimes not well represented. Except for my attendance at NGAP

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as an HAI representative, there was a noticeable absence of engagement with the helicopter community and no mention of the critical shortage of helicopter pilots.

Unfortunately, we are in competition with our fixed-wing brethren for pilots, and so it is unlikely they will solve our problem for us. The rotorcraft industry needs to step up and create our own plan for handling the pilot shortage. The HFI-UND study will be the first step.

The Noise Factor
Noise resulting from aviation operations was mentioned at NGAP as a major factor affecting our industry’s reputation. What was once a source of amazement and awe (think “the sound of freedom”) is now something that tends to deter a young person from seeking us out.

Noise is also a factor in the future sustainability of our industry, as shown by recent attempts — some successful — to limit helicopter operations because of noise complaints. We must pay attention to this issue!

Competition for Talent
Interest in pilot careers among today’s young professionals is waning, and it was interesting to note that a career as a pilot was only one of the many possibilities discussed at NGAP. A list of possible aviation-related occupational areas of interest circulated at the summit included 21 different career fields — everything from aeronautical engineering to university flight instructor.

During breaks at the NGAP Summit, I was fortunate enough to participate in some speed-mentoring sessions where I met with young professionals who showed an interest in aviation. I was highly impressed by their education level and commitment, but interestingly (and unfortunately), not one of the young people I mentored was interested in becoming a pilot. Instead, the young people I spoke to mentioned an interest in aviation law or aviation management. Another spoke of his ambition to become an aerospace engineer. Still others mentioned working for ICAO or as an airplane inspector.

Financial Outlay
Another major issue affecting the decision to become a helicopter pilot is the large financial investment required. While obtaining a rotorcraft private pilot’s license can cost as little as $15,000, going from zero to 150 hours — the amount needed to obtain a commercial pilot rating — will cost around $80,000.

And while the median annual wage for commercial pilots in 2016 was $77,200, in the short term, new pilots often need to work two jobs to survive while they build their flight

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hours — after they have already made a substantial investment in their new career in both time and money.

Our industry as a whole needs to review the issue of how pilots enter the industry. Are we welcoming them and easing their path, or erecting hurdles for them to jump over? The recruiting strategies that worked in the early 1970s, when the market was flooded with pilots returning from Vietnam, need to be updated.

**Potential Solutions**

On the bright side, here’s some positive developments that may entice new recruits to the helicopter industry:

- **Over the long term**, the return on a young person’s investment in flight training is bright. Pay as a helicopter pilot is competitive with the rest of the economy, and there is a steady demand.
- **Education opportunities** are available, including scholarships. In fact, HFI annually offers scholarships for aspiring pilots, as well as maintenance students. For young women looking to join the helicopter industry, organizations such as Women in Aviation International (WAI) and the Whirly Girls have robust scholarship programs for future pilots (and in the case of WAI, for maintainers as well). As women currently make up only 6 percent of helicopter pilots and 2 percent of maintenance technicians, tapping this pool of aviation talent could pay off big.
- **Hundreds of high schools and education programs** nationwide now include learning tracks for aviation studies in STEM curricula. Unfortunately, less than 1 percent of these programs utilize helicopters as the basis for training. HFI is working to expand the number of high school and postsecondary schools that offer helicopter-specific courses or instruction.
- **Numerous college programs** discussed during the NGAP summit provide courses leading to college degrees in aviation-related fields. University training is a major contributor to aviation careers and could play a vital role in attracting young professionals to helicopter aviation careers. Given the current importance placed on earning a college degree, our industry should embrace this type of training and include it in typical industry career paths.

Matt Callan is HAI’s director of regulations and international affairs. He is a former helicopter pilot with the U.S. Navy and Coast Guard. Matt can be reached at matt.callan@rotor.org.

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_Helicopter Foundation International annually offers scholarships for aspiring pilots, as well as maintenance students._
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Want to Damage Your Windscreen? Treat It Like Glass
Caring for Plexiglas Windscreens

By Tim Kern

Plexiglas: we call it “glass,” and this lightweight, shatter-resistant material is widely used for helicopter windscreens.

But we know it isn’t glass, and therein lies the problem — we treat the transparent acrylic as if it were. Glass is hard, scratch-resistant, and generally impermeable; it holds its shape well at both high and low temperatures and is resistant to all sorts of chemicals. Acrylic doesn’t share those qualities.

Whether it’s called Plexiglas, Perspex, or just plain ‘glas, all brands are made of acrylic, which is soft and easy to scratch. Almost anything solid can damage it, from bugs to dirt to a “clean” shop rag. Even paper towels are abrasive enough to do damage. What cleans glass may not be safe on acrylic.

While glass is resistant to most household and shop chemicals, acrylic is more susceptible, whether in direct contact with them or even as vapor. This includes glue, MEK, acetone, petroleum-based solvents, and even ammonia (common in many glass cleaners).

Glass can withstand temperatures from very cold to very hot. Acrylic, not so much. Cold weather makes acrylics brittle. A hot day can cause crazing and fogging. Heat can strain poorly fitted windows, setting up future damage.

Knowing all that brings up the question of care and cleaning of your acrylic windscreen — what can we do?

Cleaning Best Practices
Avoid using heat, abrasives, and volatiles to clean your acrylic windscreen. Don’t put hot water on cold acrylic, or vice versa. Use a mild soap in a climate-controlled hangar (or at least in the shade on a pleasant day) and clean, warm water in a new bucket, with a new microfiber cloth. Rinse thoroughly and dry with another new microfiber cloth. Then you may want to apply a recommended protectant.

You may think But what do I do if there’s a huge bug splot to clean, I have to fly in 10 minutes, it’s 100°F, and there isn’t any shade. Answer: soak the offending parts off with water and the cleanest cloth you can find. Alternatively, look around that splot or postpone the flight. Next time, clean bug splats off when they’re fresh.

Grady Aldorondo, customer and tech support for Tech-Tool Plastics, an acrylic window manufacturer, gets a lot of questions about Plexiglas care.

“I’ve been asked if it’s okay to use a window cleaner mixed with sand,” she laughs. “It isn’t. And although ammonia or acid-based chemicals may eat away at the grime a lot faster, that would not be the only thing they’ll eat away.”

People try lots of home remedies, Aldorondo says. “Don’t chip away at stuck-on, sunbaked bugs, bird poop, or dirt, and don’t scratch at the dirt with your nails, especially if you have acrylic nails.”

Floating off the dirt with water is a good idea, but don’t pour hot water over your windscreen if you are in a cold environment, and don’t use cold water if the acrylic is hot.

One specific piece of advice Aldorondo offers: do not use highly
acidic products designed to clean aluminum. “A customer called me after applying several coats of this product. The chemical compound in the product apparently was too harsh for the acrylic material. Acrylic is porous. The filmy appearance that would not wash off later may also be evidence that the product may have started breaking down the acrylic.”

**If you have to rub, pick, scrape, chip, or use solvent on a Plexiglas windscreen — don’t.**

Aldorondo offers advice here as well, based on both best practices and customer stories. First, “Don’t think that all scratches can be buffed out. When you pass your nail lightly over the scratch and you can hear your nail ‘click’ over the scratch, it may be time to buy a new window,” she says. Though you may get rid of the scratch, Aldorondo says that windows that are buffed too hard or too long may get distortion marks.

It’s common sense, but don’t expose the windows to common aircraft lubricating and hydraulic fluids and agricultural sprays. These can damage not only the acrylic, but rubber seals as well. Wash all that off with water, as soon as possible.

**How Do I Protect Acrylic?**

Tech‑Tool Plastics does not recommend any specific aftermarket finishes. Some polishes, waxes, or coatings may be great; there is a whole industry around these. Just be sure they’re formulated and recommended by the manufacturer specifically for your particular use on aviation acrylics.

Aldorondo notes that there are a lot of don’ts and very few dos in acrylic windscreen maintenance. “So knowing what you can do is relatively easy,” she says.

“Clean the windows with mild detergent washes or common soap (without ammonia or lemon) such as Dawn dishwashing detergent. It’s concentrated, so dilute it or you’ll have a soapy residue if you don’t use enough fresh, clean rinsing water,” she says. “A soft cloth baby diaper is great for washing, drying, and buffing the windows.”

If you’re replacing a windscreen, you may encounter one sprayed with Spraylat, the coating used to protect windows during shipping. Aldorondo says to use “warm (not hot) water to soften the Spraylat, or a water‑saturated cotton ball. Place it at the edge of the Spraylat coating, let it sit for a minute or two, then rub in a circular motion. The Spraylat should start moving and you can start peeling it back.”

In summary, if you have to rub, pick, scrape, chip, or use solvent on a Plexiglas windscreen — don’t. Nearly everything can — and should — be floated off with clean water, mild liquid detergent, and patience. Doing this at the end of every flight will help ensure that residue and debris do not accumulate and harden.

If you take good care of your acrylic, you will not only increase the lifespan of your windscreen, but you will also have safer flights with a clear field of vision.

Tim Kern is an aviation writer whose work has appeared in more than 50 aviation publications. He is a private pilot and holds an MBA in finance and operations from Northwestern University. He has extensive experience in machining and both motorcycle and auto racing, and was CEO of an airplane engine company in the early 1990s. Tim is the only journalist to complete the ALEA Accident Investigation course or to have earned NBAA’s CAM (Certified Aviation Manager) certification.

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The tension between managing weather hazards and responding to urgent need is intrinsic to both search-and-rescue (SAR) and helicopter air ambulance operations. Lost hikers, downed aircraft, and bloody auto crashes — the very weather that makes these accidents more likely will also impede the first responders trying to reach them.

While there are missions weather doesn’t complicate — a fallen rock-climber on a sunny spring afternoon, or an interhospital transfer above rush-hour gridlock — operators have to anticipate that when they’re needed most may be when they’re least able to respond. Standardized procedures for settling the most difficult decisions before dispatch can’t anticipate every contingency encountered in the field, and a long run of brilliant rescues may even blur the true location of the risk-benefit balance. Such was the case in the crash of an experienced helicopter pilot during a 2013 rescue mission in Alaska.

In Good Hands
At 7:35 p.m. Alaska Daylight Time on March 30, 2013, the MatCom dispatch center in Wasilla received a 911 call from a snowmobiler whose vehicle was stuck in a ditch under the InterTie high-voltage lines between Larson Lake and Talkeetna. He had suffered bruised ribs, was unable to free his machine, and was at risk of hypothermia if not rescued quickly.

The Alaska state trooper on duty at Talkeetna tried to coordinate a ground expedition, but could not. No Alaska wildlife troopers were on duty nearby, and local civilians with snowmobiles and SAR experience were put off by the combination of long distance, poor snow conditions, and deteriorating weather, including rain showers.

At 8:09 p.m., the trooper contacted his SAR coordinator to request dispatch of the Alaska Department of Public Safety’s (DPS) primary search-and-rescue helicopter: N911AA, a Eurocopter AS350 B3 operated under the call sign HELO-1.

The coordinator reached the pilot on call within 10 minutes. After checking the weather, the pilot called back a few minutes later to accept the flight. When his wife asked, he told her the weather was “good” and left for Ted Stevens Anchorage International Airport (PANC). At 8:51 p.m., he called the Signature fixed-base operator to request help pulling N911AA from its hangar. At 9:17 p.m. — just over two hours after the initial 911 call — he radioed dispatch that he was airborne.

The mission could hardly have been placed in better hands. In more than 12 years of flying for DPS, the pilot had received three commendations for exceptional performance during rescue operations. His personnel file contained half a dozen letters of gratitude from people he’d saved or their relatives, and his annual performance evaluations uniformly rated him “outstanding” or “high acceptable.”

Six months before, he’d rescued three people stranded on a gravel bar in a flooding river after an Air National Guard HH-60 Pave Hawk had to turn back for weather too low to traverse a mountain pass. The DPS pilot stayed up all night monitoring weather radar until he spotted a break, launching at 3:00 a.m. He followed a lower route to avoid the
pass and succeeded in extricating all three.

His wife and colleagues attested to the great satisfaction these rescues brought him. However, his superiors, pilot colleagues and observers, and tactical flight officers who’d flown with him also agreed that he wasn’t a risk-taker. He flew “by the book” and could be “completely trusted.” His relief pilot, who’d flown with him frequently, described him as “a sound professional” and “the best helicopter pilot” with whom he’d ever flown.

To the Scene
At 9:42 p.m., the pilot advised dispatch that he was approaching Sunshine, a landing zone near the Talkeetna barracks, where he boarded a state trooper qualified to serve as flight observer. They lifted again almost immediately, found the snowmobiler a few minutes later, and landed on a frozen lake less than one-quarter mile away. By that time, the victim was severely hypothermic and too weak to walk.

It took the pilot and observer about an hour to reach him and get him back to the helicopter. At 11:16 p.m., the pilot radioed dispatch that they were returning to Sunshine and asked to have an ambulance meet them. That was the last transmission received from HELO-1.

The outbound flight from Sunshine to the landing zone had taken 11 minutes. Beginning at 12:39 a.m. on April 1, almost an hour-and-a-half after their reported departure, the dispatcher made more than 30 attempts to reach either the helicopter or the snowmobiler, alternating between radio and telephone.

A ground search was launched at 2:30 a.m., by which time the helicopter’s fuel supply would have been exhausted had it remained airborne. An Alaska National Guard Pave Hawk joined the search at 7:00 a.m. At about 9:30 a.m., its crew located the accident site roughly 3 miles south of HELO-1’s point of departure from the frozen lake.

What Happened ...
Investigators found N911AA lying inverted and almost entirely consumed by a postcrash fire. All of the wreckage was located at the scene. The debris path was only 75 feet, and although the crash site was forested, only one tree was broken, indicating a near-vertical descent. Impact and fire damage were severe, but to the extent evaluation was possible there was no evidence of any mechanical failure before the crash.

In earlier decades, these circumstances — a remote location with neither witnesses nor survivors — might have made the cause of the accident impossible to determine. But data recovered from three pieces of equipment on HELO-1 allowed investigators to construct a detailed picture of the aircraft’s final moments.

An installed Garmin 430 and a handheld Garmin 296 GPS logged the aircraft’s airspeed, ground track, and altitude. An Appareo Systems Vision 1000 cockpit recorder captured images of the windshield and part
of the instrument panel; the lip light on the pilot’s helmet indicated his head movements. The helicopter also contained an internal attitude heading and reference system that tracked acceleration in all three axes as well as pitch, yaw, and roll.

As he had on the outbound flight, the pilot took off using his night-vision goggles (NVGs) and with the turn coordinator’s circuit breaker pulled (his habit of disabling the turn coordinator was known but not explained). No blowing snow was visible, but nothing could be seen outside after liftoff.

The helicopter initially climbed to about 250 feet above ground level (AGL) at a groundspeed of 60 knots but descended to 100 feet and briefly slowed to 20 knots as it maneuvered around hills, presumably beneath low ceilings. About three minutes into the flight, it slowed again and began a gradual climb as the lip light shifted from purposeful alternation between the flight instruments and windows to in performance studies of helicopter pilots unexpectedly entering instrument meteorological conditions (IMC), the NTSB concluded that the pilot had been unable to maintain control after losing visual references.

With the turn coordinator already disabled, caging the attitude indicator — now giving increasingly extreme pitch and bank readings — left the aircraft’s fate wholly dependent on the hope of a return to visual conditions.

... And Why

In retrospect, the pilot’s escape plan seems more aspirational than practical. Although he held both a fixed-wing ATP certificate and an instrument-helicopter rating, almost all of his instrument time was in airplanes. He hadn’t flown in actual instrument conditions since before 2001, and his only helicopter time in actual IMC was 0.5 hours in 1986. While the AS350 did have basic attitude instruments, it lacked the stability augmentation or autopilot controllability of other systems required for instrument flight rules (IFR) certification.

He did not contact Flight Service before accepting the flight. According to colleagues, his online weather check mostly likely relied on the area forecast and Talkeetna’s Terminal Aerodrome Forecast and current observations. Conditions at takeoff were consistent with Talkeetna’s forecast of broken layers at 1,000 and 1,800 feet AGL and more than 6 miles visibility in light rain. DPS imposed no weather minimums beyond statutory requirements, but the conditions met the pilot’s written personal minimums of 2 miles visibility and 500-foot ceilings for a visual flight rules (VFR) flight using NVG.

He didn’t seek an update before lifting off on the 16-mile return flight. During the hour they’d been on the ground, however, a line of showers had begun moving north from Palmer toward Talkeetna. Three witnesses in a 10-mile radius recalled that the rain began changing to heavy snow during the time the helicopter was on the ground. By 11:00 p.m., one said, it was “coming down like a son of a gun.” The fact that HELO-1’s initial altitude on the return leg was 500 feet lower than outbound suggests that ceilings had come down considerably in the interim.

The extremity of the snowmobiler’s condition isn’t known, but the NTSB concluded that the pilot’s powerful motivation to complete rescues and his impressive previous record likely figured into his decision to hazard a short flight under lowering ceilings. Once airborne, prospects for finding a suitable precautionary landing site were uncertain at best — and disappeared along with the visibility. Notable success can create perils of its own.

The Takeaway

Success certainly beats failure, especially for rescue pilots, but it comes with hazards of its own.

A history of overcoming challenges can make accurate evaluation of future missions’ risk/benefit balance more difficult. It may also become harder to remember that the weather you’ll deal with is the weather you get, not what was forecast. It pays to double-check conditions.

And once the patient’s safely on board the aircraft, waiting for the weather to pass may be a better option than immediate departure. Clouds and precipitation move, ground resources could be available ... and crashing doesn’t improve anybody’s prospects.

David Jack Kenny is a fixed-wing ATP with commercial privileges for helicopter. He also holds degrees in statistics from Stanford and The George Washington University. From 2008 through 2017, he served as the statistician for AOPA’s Air Safety Institute, where he authored eight editions of its Joseph T. Nall Report, multiple other research findings, and nearly 500 articles for popular audiences. He’d rather be flying.
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HAI Hires New Director of Membership

HAI is pleased to announce the hiring of Anuja Miner as director of membership. In this position, Miner is responsible for overseeing the membership recruitment and retention operations of the association, including the development of membership campaigns, member services, and affinity programs.

“We are excited that Anuja has joined the HAI team,” says Matthew Zuccaro, president and CEO of HAI. “Her previous association management and membership experience will assist HAI in the expansion and enhancement of member services. Anuja will be on-site at HAI HELI-EXPO 2018 in Las Vegas to meet our members firsthand.”

“I am pleased and excited to join HAI and help build its vibrant community of helicopter owners and operators, UAS owners and operators, manufacturers, and suppliers,” says Miner. “It is very exciting to help provide our members with the opportunity to become more involved in the issues affecting our industry and assist them in educating lawmakers and others about our efforts to operate safely and effectively.”

Before joining HAI, Miner, a graduate of the University of Michigan, served as executive vice president of the Council of State Restaurant Associations, vice president of membership for the National Milk Producers Federation, and executive director of the American Butter Institute. She lives in Alexandria, Virginia, where HAI’s headquarters is based.
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ANNOUNCING CANDIDATES FOR ELECTION TO THE HAI BOARD OF DIRECTORS

The following candidates for the HAI Board of Directors were nominated in accordance with the HAI By-Laws. Candidates elected to the HAI Board of Directors will serve a three-year term, beginning July 1, 2018.

Candidates for the TWO Regular Member – Commercial Seats

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<td>Kachina Aviation</td>
<td>Nampa, Idaho, USA</td>
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<td>Jan Becker</td>
<td>Becker Helicopter Services</td>
<td>Marcoola, Queensland, Australia</td>
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<td>Afonso Joaquim</td>
<td>SonAir</td>
<td>Luanda, Angola</td>
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<td>David McColl</td>
<td>Air2</td>
<td>Timonium, Maryland, USA</td>
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<td>Ron Stewart</td>
<td>Wilson Construction Co.</td>
<td>Canby, Oregon, USA</td>
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Candidates for the ONE Regular Member – General Aviation Seat

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<td>Jack Matiasevich</td>
<td>Southern California Edison</td>
<td>Chino, California, USA</td>
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<tr>
<td>Jeffery Smith</td>
<td>R.O.P. Aviation</td>
<td>Teterboro, New Jersey, USA</td>
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Visit rotor.org/election to learn more about the election, including a message from each candidate and their résumé or CV. Each candidate will also speak at the HAI Annual Membership Meeting & Breakfast at HAI HELI-EXPO 2018 in Las Vegas.

VOTING FOR THE HAI BOARD OF DIRECTORS

Who can vote?
The designated member representatives of HAI Regular – Operator members are eligible to vote in Board of Director elections.

Where can I vote?
Designated member representatives can vote:

ONLINE: Check your email for an online ballot that was sent from roxanne.fox@rotor.org on Feb. 2, 2018. If you have not yet received any voting materials via email, please contact roxanne.fox@rotor.org.

IN PERSON: Membership representatives may vote in person at the HAI Annual Membership Meeting & Breakfast at HAI HELI-EXPO 2018: Tue., Feb. 27, 8:00 AM – 10:00 AM, Room N245, Las Vegas Convention Center

Voting will continue at the HAI Membership Counter at Registration in the Grand Lobby of the Las Vegas Convention Center, from 11:00 AM until 3:00 PM, at which time voting will close.

Election results will be announced at the Salute to Excellence Awards dinner, Wed., Feb. 28.
Visit rotor.org/election to learn more about the election, including a message from each candidate and their résumé or CV. Each candidate will also speak at the HAI Annual Membership Meeting & Breakfast at HAI HELI-EXPO 2018 in Las Vegas.

Candidates for the TWO Regular Member – Commercial Seats
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  Nampa, Idaho, USA
- Jan Becker
  Becker Helicopter Services
  Marcoola, Queensland, Australia
- Afonso Joaquim
  SonAir
  Luanda, Angola
- David McColl
  Air2
  Timonium, Maryland, USA
- Ron Stewart
  Wilson Construction Co.
  Canby, Oregon, USA

Candidates for the ONE Regular Member – General Aviation Seat
- Jack Matiasevich
  Southern California Edison
  Chino, California, USA
- Jeffery Smith
  R.O.P. Aviation
  Teterboro, New Jersey, USA

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ANNOUNCING CANDIDATES FOR ELECTION TO THE HAI BOARD OF DIRECTORS

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**Esther Beckett**

**Henderson, Nevada, USA**

**Originally From:** Macon, France

**Current Job:** Helicopter captain for Papillon Airways

**First Aviation Job:** Helicopter flight instructor and instrument instructor in Florida

**Favorite Helicopter:** AgustaWestland AW109

---

**Your current role?**

*As a helicopter captain for Papillon Airways, I conduct Part 135 helicopter tours to and from the Grand Canyon Special Flight Rules Area.*

**Your career goals?**

*My goal is to conduct search-and-rescue operations in mountainous terrain, although I personally consider each mission and skill gained in the process as a goal of its own. I am still discovering the industry and refining that dream as I go.*

**What do you think is the biggest threat to the helicopter industry?**

*I think the future of the helicopter industry relies in part on the public's opinion, which is often tainted by negative publicity or lack of clear communication on our part as aviation professionals.*

---

**How did you decide helicopter aviation was the career for you?**

*I wanted to be a pilot from age 12 after reading about pilots in a Tom Clancy novel. I pursued other studies first. My master's degree in literature and translation got me a job as an interpreter, which brought me to Italy in the back of a military aircraft, and the aviation bug bit immediately. After two years, as my career as a flying interpreter was nearing its end, I decided to get my private license in the Italian Alps before deciding on a career change. I went on to get both FAA and EASA commercial licenses, as well as frozen EASA ATP and FAA CFI and CFII, at Bristow Academy, Florida.*
Judith Grigsby

*Shelbyville, Tennessee, USA*

**Current Job:** A&P mechanic for Air Evac Lifeteam

**First Aviation Job:** Line avionics technician and CH-47 Chinook mechanic in the U.S. Army

**Favorite Helicopter:** CH-47 Chinook

**Your current role?**

As an A&P mechanic for Air Evac Lifeteam, my primary responsibility is to maintain airworthiness and availability on our Bell 206L fleet aircraft that provide lifesaving access for our communities.

**Your most memorable helicopter ride?**

My most memorable helicopter ride was as a newly assigned avionics mechanic at my first duty station in the U.S. Army. I was invited to ride along during a pilot's retirement celebration “final” flight. Not only was it my first time up in a military helicopter, it was my first introduction to how much power and force the UH-60 Black Hawk had. It was the most amazing and scenic flight up along the Eastern Shore of the Chesapeake Bay and Atlantic Ocean.

**Your career goals?**

I am currently working towards my Bachelor of Science degree in aviation maintenance management. My goal is to eventually pursue a path as an aviation safety inspector/manager.

**What advice would you give to someone pursuing your career path?**

Be prepared for constant learning and skill-refining. Take advice when it is given, and keep your ego out of your work. Always remember to do the right thing. Be humble and have personal integrity in the work you do. And never forget how COOL your job is!
2018

February 20–22
Airworthiness and HUMS Technical Meeting
AHS International
Huntsville, Alabama, USA
vtol.org/cbm

February 26–March 1
(Exhibits open Feb. 27–Mar. 1)

HAI HELI-EXPO 2018
Helicopter Association International
Las Vegas, Nevada, USA
heliexpo.rotor.org

March 12–14
Aerial Firefighting North America 2018
Tangent Link
Sacramento, California, USA
aerial-firefighting-northamerica.com

March 17
American Heroes Airshow
The American Heroes Aviation Network
Gainsville, Florida, USA
heroes-airshow.com

March 22–24
2018 International Women in Aviation Conference
Women in Aviation International
Reno, Nevada, USA
wai.org/2018-international-women-aviation-conference

April 17–19
Asian Business Aviation Conference and Exhibition
National Business Aviation Association (NBAA) and Asian Business Aviation Association (AsBAA)
Shanghai, China
abace.aero/2018

April 17–19
21st World Aviation Training Summit
Halldale Group
Orlando, Florida, USA
wats-event.com

April 25–27
2018 Army Aviation Mission Solutions Summit
Army Aviation Association of America
Nashville, Tennessee, USA
www.quad-a.org/18summit

April 28
Careers in Aviation Expo
Wings Magazine and Helicopters Magazine
Mississauga, Ontario, Canada
careersinaviation.ca/toronto/registration

May 14–17
74th Annual Forum and Technology Display: The Future of Vertical Flight (Forum 74)
AHS International
Phoenix, Arizona, USA
vtol.org/forum

May 21–24
PAVCon Europe 2018
Warsaw, Poland
pavcon.org

May 24–26
HeliRussia 2018
Ministry of Industry and Trade of Russia
Moscow, Russia
www.helirussia.ru

May 29–31
2018 European Business Aviation Conference & Exhibition (EBACE2018)
NBAA
Geneva, Switzerland
ebace.aero/2018

June 5–6
SAE 2018 Aviation Technology Forum
SAE International
Shanghai, China
sae.org/events/atf

June 14–16
Heli UK Expo 2018
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High Wycombe, England, United Kingdom
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October 2–4
2018 CHC Safety and Quality Summit
CHC
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David Betts: Living the Aviation Dream in Australia

David Betts, winner of a Helicopter Foundation International (HFI) 2017 Maintenance Technician Certificate Scholarship, has worked in the aviation industry in Queensland, Australia, for 20 years, holding jobs ranging from rescue swimmer, paramedic, and aircrew winch operator. But it wasn’t until he was given a chance by Michael Yipp of Becker Helicopters to work as an apprentice maintenance technician that he reached his long-time goal of aviation maintenance. 

Having already obtained his Diploma of Justice and Diploma of Health Science Paramedical Studies, Betts is currently working to complete his Bachelor of Health Science. He believes “education is the cornerstone of success.” It was perfect timing when he saw the advertisement for the HFI scholarship program in ROTOR. Betts plans to use the scholarship to pay for additional training for Australia’s Civil Aviation Safety Authority licensed aviation maintenance engineer examinations and registration.

Betts continues to work at Becker Helicopters in Queensland, which gives him great experience because of the number of hours they fly and the standardization of the fleet — the company operates 18 Bell 206 JetRangers to provide students with a consistent training environment.

“Becker has a rebuild program where we completely strip down the airframe, paint strip, replace the wiring, and rebuild the aircraft from the ground up,” Betts says. “It’s a fantastic program for an apprentice. We also carry out overhauls in addition to general servicing. This broad range of work is giving me a solid base and understanding of the maintenance industry. I feel as though I could not wish for a better start as an apprentice.”

Once his apprenticeship is complete, Betts looks forward to continuing to grow and learn as an engineer. “As for the long term, we will see where I end up. Life has presented many opportunities to me as a result of my experience in the aviation industry, and I am forever amazed at the skills, knowledge, and mentors I have been fortunate enough to come across in the aviation industry. I hope to one day be in a position to be able to return this good fortune to the industry.”

When asked about his advice to those considering a career in aviation, Betts says, “Go for it! Read widely and always be open to the many opportunities that this amazing industry presents.”

Allison McKay is vice president of Helicopter Foundation International.
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<td>Hertz</td>
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