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# THE PULSE OF THE HELICOPTER INDUSTRY

2018 PHOTO CONTEST - maciej mikiewicz grand prize winne

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# **ON THE COVER**

A PZL W-3A operated by the Tatra Mountain rescue service flies a rescue mission on Rysy, the highest peak in Poland. This photo, by 28-year-old anesthesiology resident and mountain rescuer Maciej Mikiewicz, has been named the Grand Prize Winner of the 2018 Vertical Magazine Photo Contest.

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November Winner



### Have a great photo to share? We want to see it!

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### **Publishers**

GROUP PUBLISHER | Mike Reyno, mike@mhmpub.com GROUP PUBLISHER Linda Reyno, linda@mhmpub.com ASSOCIATE PUBLISHER Derek Kast, derek@mhmpub.com

## Editors

SPECIAL PROJECTS EDITOR Elan Head, elan@mhmpub.com

EDITOR-IN-CHIEF | Oliver Johnson, oliver@mhmpub.com JR. EDITOR Dayna Fedy, dayna@mhmpub.com

### Sales

SALES & MARKETING DIRECTOR | Tim Muise, tim@mhmpub.com MARKETPLACE SALES MANAGER Carla McKay, carla@mhmpub.com

CIRCULATION MANAGER Leanne Willis, leanne@mhmpub.com

# **Design & Web**

PRODUCTION MANAGER | Jen Colven, jen@mhmpub.com GRAPHIC DESIGNER Kaytlyn Wismayer, kaytlyn@mhmpub.com WEB DEVELOPER | Shawn Pieters, shawn@mhmpub.com

# **Contributing Writers**

John Carinha, Thierry Dubois, Geoff Goodyear, Kim Hutchings, Guy R. Maher, Dan Megna, Skip Robinson, Andy Roe, Howard Slutsken, Corey Taylor, Zaron Welch

# **Contributing Photographers**

Remy Bertrand, Peter Handley, Lloyd Horgan, Ammy Jorgenson, Dan Megna, Heath Moffatt, Anthony Pecchi, Mike Reyno, Rob Reyno, Skip Robinson, Evan Welch, Ben Wiborg

# **Our Publications**



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# Column

Focus on Safety // Geoff Goodyear



**Cellar!** 

as it was getting a little annoying), and became apparent that we were the or There was a concourse that led out to over and seeing a state trooper walkin proceeded out of sight. A second or t to confirm his original observation and his chest. Now, it was not a slow, thou

By and large, we in the helicopter community are an intrepid and well-traveled lot. Our jobs tend to take us to many different places; areas where we might not be up to speed on local risks or knowledge. Depending on your outlook on life, some will find this exciting and inspirational, while others will find it a tad disturbing. Then there are the rest of us who have no idea of what we are getting into!

I tend to fall into the latter category. Allow me to illustrate.

Many years ago, I was sent to the Bell Helicopter Training Academy in Fort Worth, Texas, to do some training on a shiny new L4 and then ferry it home across the breadth of North America to Labrador. It was a very exciting prospect for my wife, Alison, and I, as the end of exercise meant coming home while looking down from the helicopter as the continent slipped by. But I had to get through my time in Texas first.

After a hard day of hitting the books, several of us decided to do a bit of evening shopping at a nearby mall. Alison and I were accompanied by David, a colleague of mine from Canada, and Mike, a fellow trainee from the great state of Tennessee. While David rambled about the mall, Alison, Mike and I strolled out into the parking lot, and Mike and I enjoyed an evening cigar. During our puffing, some lightning appeared on the horizon, which kept us occupied. As the storm moved closer, it turned into the most magical natural display we had ever witnessed, and our "Ooohhhhs" and "Aaahhhhs" only paused when we took a puff on our cigars. It was an awe-inspiring display of nature.

Of course, the lighting was accompanied by incredible thunder, which then became mixed with an air raid siren. I remember thinking to myself, "Who, in their right mind, would launch an air raid in this weather?!" Anyway, the siren soon stopped (which we all appreciated as it was getting a little annoying), and as we continued to survey nature in all her fury, it became apparent that we were the only folks around. All other humans had vanished.

There was a concourse that led out to our smoking station, and I remember looking over and seeing a state trooper walking across it. He glanced out to see us, and then proceeded out of sight. A second or two later, he reappeared in the hallway, looked out to confirm his original observation and then with hands on his hips, he hung his head to his chest. Now, it was not a slow, thoughtful bow that could be interpreted as a respectful greeting, but rather a quick slump of the head one might perform in derision as one considers the fate of mankind while questioning Darwin's theories.

He slowly ambled out through the concourse to the doorway, came through the door and tipped back his hat.

"Y'all aren't from here are ya?" he inquired. With my Newfoundland Irish/English accent, Mike's thick Tennessee twang and the officer's equally thick Texan drawl, communications were difficult, but not impossible. "Why, no!," I replied. I was thrilled that he was actually interested in where we were from and thought, "What a great way to promote tourism by having law enforcement officials show such interest in visitors." He invoked closure on the ensuing discussion and ordered us to follow him.

Apparently, the sirens indicated an inbound tornado. Unfortunately, we never did get to see it, as our fearless and unaware group was led to a Walmart basement to wait until the all-clear. We had no idea what happened to David, but came to learn afterwards that he was browsing in the Victoria's Secret outlet when the tornado watch started, and was heard advising all within earshot to, "Put Toto in the root cellar! Put Toto in the root cellar!"

That bastion of commercial enterprise known as Walmart remained intact above us and eventually we were able to emerge squirrel-like from our sanctuary to continue our evening activities. Fortunately none of us got swept up in a *Wizard of Oz* moment as our tornado decided our parking lot was not interesting enough and passed us by, but we did get to meet some really interesting people — albeit in the basement of a department store. But a bit of local area knowledge could have made the event far less risky (although much less interesting).

Enjoy your industry travels, wherever they may take you — and remember, forewarned with a bit of local-area knowledge is forearmed.

I remember thinking to myself, "Who, in their right mind, would launch an air raid in this weather?!"

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# Column

Focus on Training // Andy Roe



Aviation Units of Measure



Calculations using the wrong units of measure have resulted in unfortunate incidents in aviation and even in space exploration. Those interested in learning to fly often ask if there is a prerequisite need to know complicated mathematics or physics. Although the answer is "no," student pilots with good basic calculating skills are best able to tackle the academic portion of the program. Another difficult challenge to helicopter students is learning to use the many different units of measurement that are assigned to aviation.

Despite the fact that the metric system is in widespread use around the globe, many countries have found it hard to switch from the customary units of the British imperial system, established in 1824. To make matters more complicated, the system of measurements used in the United States — U.S. customary units — share the same origin and many of the same names as those in the imperial system, but with some significant differences.

The U.S. is now the only industrialized country in the world that does not use the metric system or SI (Système International d'unités) as its predominant system of measurement, and this has had an impact on aviation. Countries like Canada and the U.K. should be fully converted to the metric system, but still use some imperial units, and this is at least in part because of their close trading relationship with the U.S. Canadian pilots flying American helicopters, some of which are made in Canada, fill their fuel tanks with liters of fuel, and then monitor fuel flow in flight in US gallons or pounds per hour.

Robinson helicopters have OAT (outside air temperature) gauges that can be read in Celsius or Fahrenheit, but all calculations on placards and in the flight manual/pilot operating handbook are in Celsius. Canadians are used to the Celsius scale, but Americans helicopter pilots are not. Wind speed is another source of dismay, with miles per hour, knots, kilometers per hour and meters per second all being used to express wind speed in different countries.

Modern helicopters read airspeed in knots, but because some older helicopters have airspeed indicators in statute miles, chart rules are graduated in both nautical and statute miles. Students who should be flight planning in nautical miles often use the wrong scale, which results in navigation along a course measured in statute miles but flown in a helicopter with an airspeed indicator displaying knots. The aim of the exercise, which is to arrive at a destination at a predetermined time, is destined not to succeed when the units of measurement are not consistent.

Foreign helicopter students training in North America will need to become familiar with feet, feet per minute, pounds, inches of mercury, statute miles, nautical miles and knots. Aviation weather observations and forecasts reference visibility in statute miles, speed in knots and altitude in feet. Other countries use knots for speed, but meters and kilometers for height and distance. Standardization just doesn't seem to be a possibility in the near future.

UTC (Coordinated Universal Time) is the world time standard, and GMT (Greenwich Mean Time) is the mean (average) solar time at the prime meridian (abbreviated Z for zero degrees longitude). GMT and UTC are the same time, with aviation weather observations, forecasts and notifications referencing GMT time. For meaningful flight planning, pilots need to add or subtract from GMT to determine their local time.

On the west coast of North America, this means subtracting eight hours in the winter and seven hours in summer. Student pilots find this mental calculation awkward, and often read the GMT time as the local time. The result is that they have no idea when that thunderstorm is due to arrive or when a giant crane will be working temporarily near the airport.

Calculations using the wrong units of measure have resulted in unfortunate incidents in aviation and even in space exploration. Canada started converting to the metric system in 1975, and in 1983, an Air Canada Boeing 767 ran out of fuel because the calculations were made in pounds instead of kilograms. The airplane had much less fuel on board than the pilots thought — by a factor of 2.2 (the conversion rate from pounds to kilograms). When fuel starvation turned the 767 into a glider, the pilots were able to accomplish a successful dead-stick landing at a small airport nearby. Statute and nautical miles are not that far apart, but pounds and kilograms are.

In 1999, the spacecraft "Mars Climate Orbiter" burned up in the Red Planet's atmosphere as it was on approach for orbital insertion. The flight control thrust calculations on Orbiter were specified in SI units (Newton-seconds) but the ground-based navigation team used calculations in non-SI units (pound-force seconds) which only slowed the spacecraft by half of what the original code called for. It seems incredible that the loss of an important space mission was due to such a basic mistake.

Student pilots should be encouraged to "think globally" to minimize the possibility of intermixing incompatible units. Linear thinkers make calculations and solve problems by following a series of chronological steps to achieve a goal, and are vulnerable to making errors when so many different units of measure are in play. Global thinkers, however, focus on the big picture outcome and then process the information necessary to arrive at the desired result. Global thinkers are more likely to catch themselves before using incorrect units of measure in a calculation.

If you choose helicopter flying as a private endeavor or a career option, you should fasten your seatbelt, because you will need to learn to use many different units of measurement, metric and otherwise — and you will just have to learn to adapt to the chaos.

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Rights of Passage My business was born in my garage. It was June 2004, and I had made the decision to never again be an employee. I took a leap of faith, with nothing more than a tool bag and \$220,000 of debt to cover basic specialty tools and a laser wire marking machine. At first, the work was mundane, with a litter of small jobs totalling a couple hundred dollars each. It was all about wire marking and standing in front of a machine worth twice the value of my car and letting it do its fully automated thing — pulling wire, marking it and cutting it.

I didn't know it then, but these jobs were the proving grounds for greater things to come. I was earning my stripes almost as steadily as my loan was being paid off. I had set a goal to be debt-free in three years, and based on the track record of most start-up businesses, I was clearly living in a world of fairy dust and glitter. It was a dream; something unachievable or not entirely there. In my own case, I had this financial fantasy, but also the reality of these little monthly certainties known as interest payments and bills.

As the business grew and moved into a more established facility, so too did the scope of the growing number of work orders. I recall receiving a call from a Bell medium operator in Eastern Canada. He had a mixed fleet of Bell and Airbus helicopters and required extensive upgrades on three different helicopters and annual checks on two others. I quoted the job and was on a plane a few weeks later, destined for my first offsite job. I often speak of the psychology of money, and this being my largest job up to that point, I was motivated and driven. The profits would help me put a dent in my debt; I knew as soon as the money was made, it was going to be gone, but it would be a "good" gone, and bring me a step closer to my financial dream.

The project was quoted at 10 to 12 days, and I was done in seven. I had worked 12 to 14 hours each day, rarely stopping to break. I was completely immersed in the project and almost high on the idea of accomplishment and compensation. After everything checked out, the flight tests were completed and the log entries were filled out, I packed my tools and consumable parts and stood ready for the "moment." It was payday, and having no prior terms with me, this operator had agreed to pay me on delivery.

I sat at his desk in a cold, dimly-lit hangar with wet palms and a moist brow. I hated asking for or waiting on money. It felt wrong. It felt entitled, and I was new to this game, especially given it was my first five-figure project. My client sat stimming in his chair with a gentle rock, eyes focused on my invoice in front of him. "How many hours does this quote equate to?" he asked. Having flat-rated the project, it was a lump-sum quote and I knew where he was going with his question. The idea that I had finished so quickly didn't constitute the forthcoming payout in his mind — or so I thought. I got nervous. I felt like a tourist arriving in a country with overseas fruit and unknowingly being in the wrong.

"It is what it is," I answered. "It's a figure based on average labor times for the same, if not similar, work conducted on the same aircraft type while I was under the employ of other companies. How motivated I am to work and get through the workscope is not measured in dollars but rather, rate of time. I worked hard, fast and efficient. I don't have a total for you. It would not be a fair assessment of the actual effort taken to do all this work." It was the most on-the-fly, fluffy and wordy response I think I had ever conjured up. His eyes never left my invoice as his left arm swung around offering me the slip of paper that was in his hand. It was a check, made out to me, for the full amount.

That moment became my company's right of passage. In business terms, it was a large monetary recognition for services rendered. In real terms, it was a lesson in earned respect, money and growth.

"

The profits would help me put a dent in my debt; I knew as soon as the money was made, it was going to be gone, but it would be a "good" gone, and bring me a step closer to my financial dream.



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Focus on Leadership // Kim Hutchings



& Conflict

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Oftentimes we think it is easier to simply ignore someone in order to avoid a situation or conversation that may lead to conflict. This is not the best approach for those who rely on each other to complete an operation. I recently gave a presentation at a safety event about the importance of emotional intelligence (EI) in aviation and how it can influence safety. Part of the presentation included how important it is for pilots to have EI when it comes to attitudes and decision-making. For those who don't know what EI is, Multi-Health Systems (the company that designed the EQi 2.0 assessment) describes it as a set of emotional and social skills that influence the way we perceive and express ourselves; develop and maintain social relationships; cope with challenges; and use emotional information in an effective and meaningful way.

After the presentation, one of the audience members came up and told me a story about two pilots they had known who did not get along in the cockpit — there was a great deal of conflict between them and they were known to yell at each other during flights. Unfortunately, the story ended with them having a fatal accident in which neither one survived.

I have heard numerous stories over the years about pilots and crew not getting along. Most don't end in a fatal accident, but sadly some of them do.

So, what happens when coworkers do not get along? How do you handle the situation? Conflict in itself is not a bad thing, unless it becomes negative. This happens when it is left to escalate to the point where people begin to feel defeated, and a combative climate of distrust and suspicion develops.

In "The Right Way to Fight" in the *Harvard Business Review*, Amy Gallo explains that most people are uncomfortable discussing differences and that disagreements rarely go smoothly.

Differences of opinion are common in the workplace and don't always result in something bad, but what happens when conflict is poorly managed? In aviation, this can become a safety issue, and could lead to something catastrophic.

Safety professionals look for ways to mitigate risk, control for human vulnerabilities, and work to create a positive safety culture — but how do we deal with people in an organization that don't get along? Is it a safety problem, or a human resource problem?

When I asked a room of over 50 safety professionals who in their organization handles a pilot with a hazardous attitude, they weren't 100-percent sure. When I asked them who "should" handle a pilot with a hazardous attitude, again, they weren't 100-percent sure.

A pilot or employee who has a hazardous attitude and is difficult to get along with is actually a safety issue, so the problem needs to be addressed as a safety issue. What can we do about it? Since human resources, the safety manager, or chief pilot most likely will not be there on the job with you, pilots and crewmembers need to learn how to manage conflict.

According to Gallo, the first thing to do is prepare. Know the position you want to take, but also try to understand the position of your coworker — and don't assume you fully understand his or her perspective. If you understand your differences, you can take a more objective approach.

Second, when starting the conversation, try to find something on which you can both agree. This should be done face-to-face, and not in an email. If your coworker starts to vent their frustrations, don't interrupt or stop them.

Lastly, should the conversation start to get heated and personal, try to bring the conversation back to your shared goals. However, if the conversation turns aggressive, it may be best to take a break. Creating a space allows both people to calm down and provides an opportunity to consider changing the process.

If you're starting from a position of an already-damaged relationship, leadership expert Dorie Clark suggests first recognizing that making the effort is worthwhile. Second, recognize where you have contributed to the dynamic of the relationship. Lastly, you need to work to try and change that dynamic.

Oftentimes we think it is easier to simply ignore someone in order to avoid a situation or conversation that may lead to conflict. This is not the best approach for those who rely on each other to complete an operation. According to executive coach Joel Garfinkle, the first thing to do is not to put the conversation off, and then address the conversation head-on by getting right to the point. Second, focus more on what you are hearing and not so much on what you are saying. Lastly, expect a positive outcome, since this will help put you in a positive frame of mind.

If the person you are disagreeing with is more powerful than you, it can be a little tricky — but it doesn't need to be. This is particularly true when the goal is to have a strong safety culture. The first thing to do is explain that you have a different opinion, but make sure you don't use judgment words like "wrong" when you mention the difference, because it could upset the person you are disagreeing with. Instead, remain calm and explain that you are offering your opinion. Lastly, remember that the person has more power than you and will be making the final decision, so be sure to acknowledge that.

The important thing to remember is that if you remain open and handle conflict in a positive way, you can actually learn something (perhaps even improve the relationship with the person you were having conflict with), and most importantly, it can end up making everyone safer.



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Before Learned to Fly



Make sure your helicopter is airworthy, and then your worries are around your judgment and skill as a pilot, not those bangs in flight that are quickly followed by silence. Learning to fly is a humbling experience, yet also one of the most freeing endeavors a human can embark upon. Becoming so proficient that one feels like their aircraft is more of a suit they're wearing is to reach the heights. But there are critical things one needs to remember if one is going to have any career at all, let alone a successful one.

Before I learned to fly, I learned to ensure my aircraft was airworthy. Airworthy is just a three-syllable word for safe. As part of what we called the "DI" (daily inspection), I was taught to drain my low-point fuel tank sumps to make sure there was no water or other contaminants in the fuel. I was taught to check the fuel source itself to ensure I was getting what I thought I was getting. I was taught to open all cowlings to ensure the parts were all attached to each other, the fluid levels were all where they needed to be and nobody had left any tools behind. I was told stories of tools left under cowlings and the catastrophe that could result if flight occurred, and that you owned the tools if you found them. I did find tools once or twice, but confess I always gave them back, which I think was a good lesson for the engineer in question — since not telling him about it did no one any good. Once I found, during a turnaround check midday, a grease gun attached to the nipple of the

non-rotating swashplate. The gun was hanging off the hose and was riding on top of one of the servos. I don't know how I didn't see it when I opened that cowl in the morning, but it was definitely in a place that could have really caused some trouble if it was to jam the controls. Every time I found something amiss, I became more determined to ensure I never missed it again.

In addition to the moving parts, a prudent pilot checks their baggage compartments for things left behind, or maybe even placed there by others. I once flew to a mill to pick up some VIPs and received the shock of my life. I landed in the parking lot, briefed the passengers and then took their daypacks to place in the side compartment. As they stood watching, I opened the panel and there, on its back, lips pulled back in what looked like a growl, was a dead dog. Yes, a dead dog in the baggage compartment. How it came to be there is best told over beers but needless to say I added a Dead Dog Check, or "DDC" to my daily routine thereafter.

As a student, learning the things that were required before flight were as obvious as anything in aviation could possibly be, as opposed to learning regulations that considered a 747 and an R22 to be the same thing — so there was no resistance from any of my fellow students. As I progressed in my career I modified how I did DIs, usually doing the most thorough one at the end of the day. This was partly because if I'd unknowingly pranged my tail rotor I wanted to find it and announce it to my bosses rather than have the AMEs find it and be told about it later, which I would view as somehow adding to the bad press I might receive, regardless of how much we all talk about non-punitive cultures. The truth is we usually punish ourselves far more than our peers or employers do, but feelings and reality aren't always in alignment.

The consequences of not ensuring airworthiness are not hypothetical and can be tragic. A search of the many databases that compile accident information produces story after story of aircraft that crashed because something wasn't done correctly. From an accident where the only nut that attaches the main rotor was found on the workbench in the hangar, to more than one load of tourists that didn't make it home because there was no oil in the tail rotor gearbox. How long does it take to check the oil in the tail rotor gearbox? Ten seconds perhaps? How could a pilot possibly go flying without checking that oil? These are questions we ask and never seem to find answers. We need to remember the basics and take the time to do our job properly.

Not that long ago I saw a helicopter parked overnight in deep snow. After it departed I was very disappointed to see that the footprints in the snow went to the pilot's door only. Not even a walkaround. Maybe I am a little paranoid because I have had quite a few things fail in flight, but I am absolutely certain that the day I don't check my fluid levels the accident report will reflect the emptiness of one of the oil reservoirs. The old expression that God helps those who help themselves are words to live by. Literally.

Make sure your helicopter is airworthy, and then your worries are around your judgment and skill as a pilot, not those bangs in flight that are quickly followed by silence.

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Columbia Helicopters has a fleet of 21 Vertol 107s and CH-234/CH-47D Chinooks that perform heavy-lift operations around the world. Ben Wiborg Photo

### **BY OLIVER JOHNSON**

Offshore giant Bristow Helicopters is to acquire heavy-lift specialist Columbia Helicopters in a blockbuster \$560-million deal labelled "the largest transaction in the company's history" by Bristow CEO Jonathan Baliff.

The move, announced as the offshore oiland-gas specialist reported a \$140-million net loss in its second quarter financial results, was accompanied by the news that Baliff will retire from Bristow once the Columbia acquisition is complete.

Columbia, based in Aurora, Oregon, was founded in 1957 by industry pioneer Wes Lematta, and has seen global success by

specializing in providing heavy lift services, at the moment primarily to U.S. military and government customers, with its fleet of 21 Vertol 107s and CH-234/CH-47D Chinooks. It has 860 employees.

Bristow, founded just a few years earlier in 1953, specializes in offshore transport for the oil-and-gas industry, and has a fleet of 233 helicopters around the globe (including 119 large helicopters). However, the Houston, Texas-based operator has endured a difficult few years during what Baliff has called a "historic" downturn for the wider oil-and-gas industry.

The joining of the two companies will provide both with "immediate operational and financial benefits" Baliff said in a conference call with investors, calling the transaction "transformative."

"With this 560-million dollar transaction, we're creating the leading global diversified industrial aviation service company," he said. "[We're] virtually defining what that means. These are two highly complementary businesses with a shared focus on world-class safety, reliability, client service and solutions."

In a press release announcing the acquisition, Steve Bandy, president and CEO of Columbia, said the two companies shared a commitment to operational excellence that fosters long-term relationships with customers and employees. "Together with Bristow, we will have an incredible

platform to serve our global customer base," he said. "On behalf of everyone at Columbia, we are looking forward to partnering with Bristow to redefine the industrial aviation industry."

Columbia will continue to operate as a separate subsidiary with its own board and operational and management structure, will retain the Columbia name, and its aircraft will keep the distinctive Columbia livery.

"This is a company that's successful, and it's successful operating as Columbia," said Baliff.

However, Bristow hopes to be able to leverage Columbia's expertise, contacts, and its U.S. Department of Defense (DoD) Commercial Airlift Review Board (CARB) certificate — which allows it to perform outsourced military transport operations — to find new work for Bristow's "underutilized" offshore fleet. In particular, it hopes to find an application for many of its 22 remaining Airbus H225s, which have struggled to find work following a lack of demand for the type in the offshore sector. The company also has 44 S-76C/C++ aircraft in its fleet.

"We have idle 225s that can go to work within this CARB certificate, and they're already being requested today. We believe meaningful revenue opportunities abound," said Baliff. He cautioned that it could take "a year or so" to get the 225s and potentially Sikorsky S-76s — within Columbia's CARB certificate, but insisted "the demand is there" for them.

"There are two [Sikorsky] S-61s working currently in Afghanistan under a TRANSCOM contract. We believe that had we been in this partnership [with Columbia before that contract was awarded], we could have supplied some of those type of aircraft [H225s] into Afghanistan."

Bristow also expects to be able to find new work for Colombia's tandem-rotor fleet by providing them with access to new markets through Bristow's air operator certificates (AOCs) and facilities in more than 10 countries.

"[We can] pre-position them actively to [be] working in firefighting or other government work, or in onshore oil-and-gas," he said. "We've got the facilities and the AOCs to be able to do that."

He said Bristow's global footprint would

also allow it to pursue new third-party MRO opportunities in the Southern U.S., Europe and Australia.

### A DIFFICULT OFFSHORE ENVIRONMENT

News of the acquisition coincided with the release of Bristow's quarterly financial results, in which it posted a \$140 million net loss. The company pointed to foreign exchange volatility, the "timing of certain operating costs," and "continued challenges" in its fixed-wing operations.

Due to the stiff headwind, Baliff said the company is remaining focused on reductions "across the organization" and is continuing to make structural changes to its maintenance services. It's also attempting to cancel existing orders it has with OEMs — it currently has 23 large helicopters on order, with options for a further four.

"We are in the midst of ongoing negotiations with our OEM partners to not just defer cap ex [capital expenditure], but to eliminate additional capital expenditures — especially aircraft . . . that are really not needed in the oil-and-gas market today," he said. "We look at those negotiations very similar to what we did last year in our negotiations for cost recoveries from the OEMs concerning certain aircraft."

Despite this, Baliff said Bristow could look positively into the future. "[Bristow is] well positioned to take advantage of the beginning of an offshore investment cycle, as more rigs are going to work in places like the U.S. Gulf of Mexico, the North Sea, West Africa... and we're even beginning to see more rigs go to work in Brazil," he said.

Finally, Baliff revealed he would be stepping down as Bristow's CEO after over four years in the position, and eight at the company. He is to leave the company when the Columbia acquisition is completed, which is scheduled for Dec. 31, 2018, and will join Columbia's board of directors.

"I'm honored to have led Bristow, and I'm proud of what our teams have accomplished since 2010," he said. "We have diversified our aviation services . . . amidst a challenging period for the industry and the team. Bristow is such a special company with talented and dedicated employees."

Tom Amonett, vice chairman of the board of directors of Bristow, will serve as the company's interim CEO until it appoints a permanent successor to Baliff.

"On behalf of the entire company, I want to thank Jonathan for his contributions over the past eight years, including his advancement of our long-term strategy to diversify and expand our capabilities for existing and new customers," said Thomas Knudson, Bristow's chairman.

"During Jonathan's tenure, we positioned Bristow to become the world's premier, diversified industrial aviation services company, and I am confident Tom's substantial operational and leadership expertise will allow him to skillfully guide the team as we embark on this next phase of growth."

stow nopes to find new work for its fleet of Airbus H225s — potentially with the military through Columbia's CARB certificate. Heath Moffatt Photo



# Leicester AW169 crash results in safety directives



EASA has expanded an emergency airworthiness directive for AW169 and AW189 helicopters following the fatal crash of a Leonardo AW169 in Leicester, U.K. **Leonardo Photo** 

### BY ELAN HEAD

Operators of Leonardo AW169 and AW189 helicopters have been ordered to conduct inspections of their tail rotor flight control systems in the wake of a high-profile fatal AW169 crash in Leicester, England, on Oct. 27.

The crash took place just outside the King Power Stadium in Leicester, U.K. — home of Leicester City Football Club, a soccer team competing in the English Premier League roughly an hour after a game had finished. Five people died in the crash, including Vichai Srivaddhanaprabha, Leicester City's owner.

Bystander video showed the aircraft performing a vertical takeoff from the stadium's field, then spinning out of control before it had transitioned into forward flight. The helicopter crashed in a parking lot next to the stadium and burst into flames.

Despite the intense post-crash fire, the United Kingdom's Air Accidents Investigation Branch (AAIB) was able to download recordings from the aircraft's digital flight recorder. In a special bulletin published on Nov. 14, the agency described the helicopter climbing on a rearward flight path through a height of approximately 320 feet before the climb paused.

"Heading changes consistent with the direction of pedal movements were recorded initially, then the helicopter entered an increasing right yaw contrary to the pilot's left pedal command. The helicopter reached a radio height of approximately 430 feet before descending with a high rotation rate," the bulletin states.

In an emergency airworthiness directive (AD) issued on Nov. 7, the European Aviation Safety Agency (EASA) called for AW169 and AW189 operators to check for correct installation of the tail rotor servo-actuator within five flight hours or 24 hours, whichever occurs first.

The AD noted that the root cause of the accident is still to be identified. Despite this, as a precautionary measure, manufacturer Leonardo Helicopters had issued an emergency alert service bulletin (ASB) for AW169s, instructing operators to check for correct installation of the tail rotor servo-actuator. Subsequently, Leonardo issued an ASB with the same instructions for AW189 helicopters, which have a similar tail rotor design.

The EASA AD requires operators to comply with the instructions of the applicable ASB. "The incorrect installation of the [tail rotor] servo-actuator, if not detected and corrected, depending on the flight condition, could possibly result in loss of control of the helicopter," the AD states.

Operators who discover damage or other findings during the inspection of the tail rotor servo-actuator are required to contact Leonardo for approved instructions. Operators with no findings are instructed to "apply a paint mark on the nut from the rod end to the hinge bracket element in accordance with the instructions of the applicable ASB."

EASA issued another emergency AD Nov. 21, calling for AW169 and AW189 operators to conduct an inspection and breakaway torque check of the tail rotor duplex bearing, and inspection and reinstallation of the tail rotor servo-actuator castellated nut, in accordance with an alert service bulletin issued by Leonardo.

According to EASA, its latest AD "is still considered to be an interim action and further AD action may follow."

# **RotorBits**



**Universal Avionics Photo** 

### Heli-One completes Universal Avionics S-76 VVIP upgrade

Universal Avionics authorized dealer Heli-One has completed its Sikorsky S-76 VVIP helicopter flight deck upgrade.

The avionics upgrade replaces legacy Electronic Flight Instrument Systems with three UA EFI-890H Advanced Flight Displays. The system also includes a new UA UNS-1Lw Flight Management System with Vision-1 Synthetic Vision System.

The modification is available for operators who desire the modern S-76D-like avionics look and feel in other S-76 variants, including the S-76A, B, C, C+ or C++ models. Supplemental type certificates are imminent, the company said.

### Niagara Helicopters wins Innovation in Safety award



Airbus Helicopters Canada has presented Niagara Helicopters with its 2018 Innovation in Safety award.

With more than 2,800 flight hours

and nearly 100,000 passengers annually, safety has been at the forefront of Niagara Helicopters' operations for half a century. The company was also one of the first operators in Canada to voluntarily implement safety management systems.

"Niagara Helicopters has truly cemented its position as an industry leader in service and safety, and we are glad to honor them with this well-deserved award," said Romain Trapp, president, Airbus Helicopters Canada.

"This award belongs to the whole team at Niagara Helicopters who are diligently devoted to safety in all our operations," said Anna Pierce, vice president and general manager, Niagara Helicopters.

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# FAA Reauthorization Act signed into law

One key measure the bill includes is mandating crash resistant fuel systems (CRFS). A CRFS has only been available as an option for the H125 since 2014, but it has been standard on H125s manufactured in the U.S. since 2016. **Airbus Helicopters Photo** 

### **BY OLIVER JOHNSON**

On Oct. 3, the U.S. Senate passed a long-awaited reauthorization for the Federal Aviation Administration (FAA), securing funding for the agency for the next five years and enshrining a wide range of programs and measures affecting every branch of aviation.

The reauthorization was a protracted process, requiring six extensions that had pinned the agency's funding at a level established in 2012. However, it finally passed the House of Representatives by a vote of 398-23, followed by a 93-6 approval in the Senate. It was then sent to the White House, where it was signed into law by President Donald Trump on Oct. 5.

In addition to crowd-pleasing moves that will satisfy airline passengers — from establishing a minimum seat width and distance between rows of seats and banning cellphone calls on planes — and a nod to the future of travel through the creation of the Office of Spaceports, the bill had several key measures for the rotorcraft industry.

These include mandating crash resistant fuel systems (CRFS) in newly-manufactured helicopters; improved oversight for the air ambulance industry and clarity over its billing practices; an attempt to address a perceived shortage of pilots and other aviation professionals; and the introduction of new guidelines for incorporating unmanned aircraft systems (UAS) into U.S. airspace.

"This reauthorization bill provides significant improvements for general aviation and the

helicopter industry specifically," said Matt Zuccaro, HAI president and CEO, in a statement issued following the bill's passage through the Senate. "The helicopter industry faces a severe pilot and mechanic shortage, and this bill provides important solutions to help address this critical industry issue."

Zuccaro also praised the clarity the bill provides on the safe integration of UAS into the national airspace, and thanked Congress for addressing the issue of CRFS. "We commend Congress for their perseverance on this issue and for adopting the recommendations of the Rotorcraft Occupant Protection Working Group," he said.

The CRFS provision flows, in large part, from the legacy of the 2015 crash of a Flight for Life Airbus H125 (previously known as the AS350 B3e) AStar in Frisco, Colorado. Pilot Patrick Mahany lost his life in the post-crash fire that consumed the aircraft, and flight nurses Dave Repsher and Matt Bowe were severely injured. The effort to improve post-crash survivability was originally spearheaded by Mahany's widow, Karen, and then led through Congress by two of the state's legislators in the House of Representatives, Jared Polis (D-Colo.) and Ed Perlmutter (D-Colo.).

The National Transportation Safety Board urged the FAA to make CRFS mandatory in all newly-manufactured rotorcraft in a safety recommendation issued shortly after the Flight for Life crash in 2015. Previously, rotorcraft were required to meet the crashworthiness requirements of 14 Code of Federal Regulations 27.952 or 29.952. Those standards were originally introduced in October 1994, but did not apply to rotorcraft with type certificates approved before that date — including the AS350, which received its type certificate in 1977.

A CRFS has only been available as an option for the H125 since 2014, but it has been standard on H125s manufactured in the U.S. since 2016. However, a system wasn't available for legacy AS350 models until December 2017, when a retrofit kit developed by Robertson Fuel Systems and StandardAero was certified.

With the bill's passage, all newly-manufactured helicopters to be operated in the U.S. must have a CRFS installed.

"The House of Representatives has chosen to once again come together and help prevent future helicopter tragedies," said Polis.

Another key area of focus concerns increased oversight of the air ambulance industry, and more specifically, patient billing practices from air ambulance providers. The bill calls for the creation of an advisory committee to review options to improve the transparency of charges and fees for air medical services, better inform consumers of their insurance options, and protect them from balance billing.

The committee will be composed of representatives from various industry stakeholders, including air ambulance operators, patient advocacy groups, insurance providers and doctors specializing in trauma.

As Vertical reported earlier this year, the committee is expected to report on the impact of

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clearly distinguishing between charges for air transportation services and charges for non-air transportation services in bills and invoices.

The committee will also be tasked with exploring what data air ambulance providers should provide to the Department of Transportation "to improve its understanding of the air ambulance market . . . for the purposes of pursuing action related to unfair or deceptive practices," the bills states.

In a statement issued following the bill's passage through the House, the Association of Air Medical Services said it "fully supports the language" in the legislation, including the establishment of the advisory committee.

"AAMS and its members support any effort to increase transparency and engage stakeholders to ensure patients requiring lifesaving air medical transport are not burdened by a bill that [they] did not expect and cannot afford," the association said.

### **BOOSTING INDUSTRY NUMBERS**

The need to attract more young people to aviation is also outlined in the legislation. The bill calls for a report from the FAA Administrator, due within 180 days, on the agency's existing outreach efforts to elementary and secondary students to "prepare and inspire" them for careers in aviation, acknowledging a need "to mitigate an anticipated shortage of pilots and other aviation professionals."

It calls for the creation of a "Youth Access to American Jobs in Aviation Task Force," challenged with developing recommendations and strategies to encourage students, from their junior year of high school, to pursue courses that would lead to a career in aviation. To bridge the gap from education to industry, the task force will also be responsible for identifying and developing pathways for these students to secure apprenticeships and careers in aviation.

In developing its plan, the task force is expected to look at what encourages or discourages young people from pursuing careers in aviation, look at how aviation stakeholders can support those looking to join the industry, and explore ways to enhance apprenticeship and other mentorship programs — including grants and scholarships.

The task force will be appointed by the FAA Administrator, and include representatives from air carriers; airframe, engine and avionics OEMs; aircraft repair stations; local educational agencies or high schools; higher education institutions; and other aviation and education stakeholders. The Reauthorization Act also includes provisions focusing on the need to encourage more women to pursue careers in aviation, through the creation of a Women in Aviation Advisory Board. The board will look at what prevents women from pursuing careers in aviation, and has been asked to develop strategies with the industry to encourage more women to do so.

The bill also includes several key provisions that affect the UAS industry — with a knock-on impact to all other airspace users — including a call for a plan to implement UAS traffic management (UTM) services. Developed by the FAA and NASA together with industry stakeholders, this would pave the way for UAS to fly beyond visual line of sight (BVLOS) into full operational capability — including drone delivery of packages.

The bill states that UAS BVLOS operations, nighttime operations, and operations over people "have tremendous potential," and that integrating UAS safely into the national airspace system to perform these operations "should remain a top priority" for the FAA.

"The Senate passage of the FAA bill provides much-needed, multi-year stability to the entire U.S. aviation system and launches the UAS industry to new heights," said Brian Wynne, president and CEO of the Association for Unmanned Vehicle Systems International, in a statement following the announcement of the bill's passage through the Senate. He added that the UTM rulemaking would "help ensure the safe and efficient use of the national airspace."

UAS operators have been required to register their aircraft with the FAA since Dec. 21, 2015, and the bill calls on the regulator to explore the level of compliance with the mandate — and its effectiveness.

A pilot program to remotely detect or identify airborne UAS is also requested, with enforcement action authorized against UAS deemed in non-compliance with aviation laws and regulations.

"The ability to remotely identify and track UAS is the linchpin needed to advance the UAS industry, and it is critical for the ultimate realization of expanded operations, such as beyond line of sight and package delivery," said Wynne.

The bill includes a requirement for all UAS operators to pass a basic aeronautical and safety test — previously, just commercial operators were required to do so. In a similar vein, it provides annual funding for the "Know Before You Fly" campaign and other public information efforts designed to raise awareness of UAS safety issues.

# **RotorBits**

Airbus Helicopters Photo



# SAF places 6-aircraft order with Airbus

French Alps-based civil operator SAF Group has ordered six new Airbus helicopters for emergency medical service operations, mountain rescue, aerial work and passenger transport.

The order includes three light single and three light twin helicopters to be operated in France and in the Reunion Island, where SAF has recently acquired Hélilagon. Delivery of the six aircraft is planned for 2019.

### DART opens service center in Amsterdam

DART is opening a new repair and overhaul facility in Amsterdam, Netherlands. This follows the opening of a DART warehouse, located in the outskirts of the city, last year.

"Our operations are located close to the Schiphol Airport, as this will allow quick and efficient logistics for us and for any customer located in the EMEA region," said Harvey Siemens, new operations manager for the repair and overhaul facility.

DART is planning to replicate its repair and overhaul Center of Excellence, located in Broussard, Louisiana. The new facility will also be used as a European warehouse for the company.

### FlightSafety names new co-CEOs

FlightSafety International has announced that David Davenport and Ray Johns will lead the company as co-CEOs. Davenport will also serve as president of commercial, and Johns as president of government and manufacturing.

"We are honored and humbled to have been named to succeed Bruce Whitman," said Davenport and Johns. "We are thankful for his outstanding leadership and countless contributions to FlightSafety's success during his 57 years of service."

# Helicopters battle record wildfires in California



### **BY OLIVER JOHNSON**

The cleanup and reconstruction continues in California after another devastating set of wildfires — including the deadliest and most destructive wildfire in the state's history — killed at least 88 people, destroyed thousands of homes, and caused billions of dollars of damage.

At one point there were more than 40 helicopters working to battle the blazes in early November, with the majority of the damage caused by the Camp Fire in Butte County in Northern California, and the Woolsey Fire in Los Angeles and Ventura counties.

The Camp Fire started early in the morning of Nov. 8 in Butte County. Fueled by intense north winds, a dry air mass and critically dry fuels, the fire moved rapidly from the Feather River Canyon into nearby communities, largely destroying the town of Paradise, and causing extensive damage to the communities of Concow and Magalia. It was declared fully contained on Nov. 25, and fully extinguished the following day.

According to Butte County Sheriff, as of Nov. 27, 158 people remained unaccounted for following the Camp Fire. Almost 14,000 homes and 5,000 other buildings were destroyed by the fire, which burned 153,336 acres. Three firefighters were injured while battling the flames.

The Woolsey Fire also started on Nov. 8, erupting in Woolsey Canyon in Ventura County. The Santa Ana winds rapidly drove the flames to Los Angeles County.

Thousands of firefighter from local agencies and throughout the U.S. joined efforts to contain the massive wildfire, which became the largest in L.A. County history.

At the height of the fire, over 250,000 residents were evacuated and over 57,000 structures threatened.

By the time the L.A. County declared the fire fully contained on Nov. 22, it had killed three people, injured three firefighters, and destroyed or damaged over 2,000 structures. Over those 14 days, it had burned almost 97,000 acres. As of Nov. 25, 700 residents of Malibu were still to return to their homes.

Catastrophe modeler RMS estimated the insured damage at between \$7.5 billion and \$10 billion for the Camp Fire, and \$1.5 billion and \$3 billion for the Woolsey Fire.

The rotary-wing aircraft fighting the fires included Sikorsky S-70 Firehawks, Sikorsky UH-60 Black Hawks, Sikorsky S-64 Skycranes, Erickson S-64 Aircranes, Boeing CH-47s, Bell 205s, Bell UH-1s, a Kaman K-MAX, and Leonardo AW139s.

Operators working on the fires included Columbia Helicopters, Erickson, Helimax Aviation, CHI Aviation, Helicopter Transport Services, HP Helicopters, Helistream, PJ Helicopters, and HeliQwest.

They joined local agencies battling the flames, which included the California Department of Forestry and Fire Protection (Cal Fire), L.A. County Fire Department, L.A. (City) Fire Department, the Ventura County Air Support Unit, Kern County Fire Department and Santa Barbara County Fire Department/Air Support Unit.

Matt Udkow, a pilot at Santa Barbara County Fire Department, told *Vertical* his unit joined the firefight the first night of the fires. The unit performed water drops at night using night vision goggles (NVGs).

"There are limited criteria in which helicopters are utilized for night fire suppression missions — there has to be imminent risk to life, structures, assets of significant value, or mitigating an extensive suppression cost for the fire," said Udkow.

The department's Bell UH-1H is used for initial attack, he said. However, "without a night HELCO [helicopter coordinator], we are limited to two helicopters airborne in the same proximity."

Udkow said the first night of water drops was the most difficult due to the high wind and smoke.

"It was bad on Thursday [Nov. 8] night, a lot of wind and craziness everywhere; Friday night there were some structures threatened, but nothing that we were dropping on looked like it was getting burned; and then Saturday night, there was just no wind, so there was not a lot of work for us."

He said the wind speed on the first night was 26 knots, gusting to 38 and occasionally up to 43. It was this that drove the flames to move so quickly. And even when the winds died down, the smoke remained a major issue. The key to working in these conditions is to be "slow and methodical" said Udkow, as well as having good coordination between the pilot and the fire captain.

"We had to come in slow with all the obstructions and terrain in close proximity," he said. "What I was having difficulty with was seeing the terrain with any detail in the mountainous areas. The smoke was settling in the valleys, and flying towards the cultural lighting in the fore and background combined so that we couldn't really see anything in great detail or contrast. When we flew east, which was away from the lights in the area, I had a better picture of the mountains and the terrain detail, so I could slowly circle down and take my time to get a position where we could have an effective and safe water drop."

As the clear-up continued after the fire, the government of L.A. County warned of the risk of flooding, which can rise significantly after wildfires. Similarly, on Nov. 27, the National Weather Service issued a Flash Flood Watch for the areas in Butte County that had been impacted by the Camp Fire.

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# Helitech prepares for change in 2019

# WATCH VIDEO

Helitech attendees walk the show floor during its most recent edition in Amsterdam, the Netherlands. Next year, the event will move to Farnborough, U.K., and it will be rebranded as the Vertical Flight Expo. Rob Reyno Photo

### **BY THIERRY DUBOIS**

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More than 150 suppliers and 3,700 visitors attended Helitech International 2018, held Oct. 16 to 18 in Amsterdam, the Netherlands. Conference organizer Reed Exhibitions reported a 44 percent increase in unique visitor numbers at the show, with almost a third of attendees coming from operators.

In addition to exploring the trade show, attendees and exhibitors were able to attend seminars throughout the show's three days, which included presentations on the future of flight training, promising sectors and regions for growth, and overviews of the health of several key operating sectors.

This year's show also marked the end of Reed's partnership with the European Helicopter Association (EHA), with the two choosing to part ways following the 2018 edition of Helitech.

Reed had previously announced the Farnborough International exhibition and conference center, in London's outskirts, will host the 2019 edition of the show, which will be rebranded the "Vertical Flight Expo."

Organizers said the strong point of the new location is its airport, which provides attendees the ability to fly in and arrange demonstration flights — something extremely difficult to do in its previous U.K. location at the Excel convention center in central London.

Meanwhile, the EHA hopes to organize a new event from 2020 in Cologne, Germany, in conjunction with the European Aviation Safety Agency's (EASA) Rotorcraft Symposium. "EHA will no longer support Helitech," outgoing EHA chairman Jaime Arque told *Vertical* at Helitech. He hinted the 2020 event will be "with EASA and the OEMS."

The evolution of Helitech was a response to exhibitor feedback, according to event manager Teresa Heitor. The 2019 edition, in addition to being held at an airfield, will include unmanned rotorcraft — hence the change in name to the Vertical Flight Expo. The new title will coexist with the "Helitech" name for a couple of years, she said. The British Helicopter Association (BHA) will be Reed's partner in Farnborough.

The event "lost some of its soul" when it moved from Duxford airfield into urban exhibitions centers (in London and Amsterdam) from 2013, said Heitor. She believes her team has found the best of both worlds — a professional exhibition center next to an airfield — in Farnborough. She claims the site is a 30-minute drive from both Heathrow airport and Waterloo station. Shuttle buses will be available from Farnbrough Main station and hotels, she added.

"We need more aircraft, more pilots, and more technology demonstrations," Heitor said. The show is envisaged as a biennial event in Farnborough. Making it annual or moving it to continental Europe is a future possibility, depending on the eventual impact of the U.K.'s decision to leave the E.U.

Heitor's team is striving to attract airframers to the event — namely, Airbus Helicopters, Bell, Kopter, Leonardo and Sikorsky, four of whom exhibited in Amsterdam.

Asked why Farnborough will be a good venue, David Stubbs, chairman of the BHA, emphasized its ability to offer both an airfield and a convention center. "It is an aviation location and we have missed the opportunity for those attending the show to fly in and for exhibitors to conduct demonstration flights," he said. Stubbs added that this was supported by feedback he has received from "a number of people" attending the show in London in 2017 and "from the wider BHA membership."

The brand-new Farnborough International center was built by the organizers of the Farnborough air show.

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# Major issues tackled at HAC Convention



Industry suppliers joined operators from across Canada at the recent HAC Convention in Vancouver British Columbia. The association reported a sold-out trade show floor. Heath Moffatt Photo

### **BY OLIVER JOHNSON**

Operators and helicopter industry members from across Canada were joined by vendors and experts from around the world as the Helicopter Association of Canada (HAC) held its 23rd Annual Convention and Helicopter Safety Forum in Vancouver, British Columbia, Oct. 31 to Nov. 4.

The event included several days of committee meetings and workshops; technical briefings and product presentations from airframe and engine manufacturers; as well as a sold-out two-day trade show.

The conference program included a presentation on recent helicopter accidents of interest from Paul Dittman of the Transportation Safety Board (TSB), in which the TSB reaffirmed its call for the mandatory installation of lightweight flight data recorders by commercial operators. Dittman pointed out that since 2004, there have been 34 incidents or accidents in which 29 people have died where the TSB hasn't had sufficient information to be able to give a cause for the crash.

A panel discussion on "mitigating our HR crisis" in the helicopter industry agreed that a more structured solution to the issue of a pilot and engineer shortage needs to be implemented; but several members also highlighted the problem of "upskilling" — bridging the gap between a newly-qualified pilot and the minimum experience levels required by many customers.

The panelists included Bob Spracklin from the Saskatchewan Environment – Wildfire Branch; Robert Donald, executive director, Canadian Council for Aviation & Aerospace; and Todd Tkach, president of Synergy Aviation Ltd. They agreed that improved outreach is crucial in attracting more people to the industry to begin with, and that customers and clients need educating to reduce minimum flight hour requirements — and therefore prevent the industry losing newly-qualified pilots and engineers who give up on their rotary-wing careers before they've even begun.

Fred Jones, HAC's president, said the shortage has been somewhat "blunted" to date by the general industry downturn, but that demand will increase and heighten the issue as business picks up.

Kathy Fox, chair of the Transportation Safety Board (TSB), gave an update on the board's 2018 Watchlist, which identifies seven key issues — two of which are specific to aviation (risk of collisions on runways and runway overruns). Three issues are shared with other sectors:



safety management and oversight; slow progress addressing TSB recommendations; and fatigue management.

As ever, the convention included the "Hour with Transport Canada," with François Collins, associate director general, Civil Aviation, Transport Canada, sharing the stage with Fred Jones. Collins said the long-awaited fatigue regulations that will impact pilot flight and duty times are now before the Treasury Board. However, he could not say when they will be published or what form they will take.

Collins also addressed the use of cannabis by pilots, and said it remained a disqualifying factor for a pilot's medical certificate — regardless of the fact that its recreational use is now legal in Canada.

Finally, Mark Aruja, chair of Unmanned Systems Canada, gave a presentation on opportunities and challenges within the unmanned sector, with the focus now shifting to operations beyond visual line of sight. Eugene Hoeven, from EH&A Aviation Management Consulting, discussed unmanned traffic management (UTM), which he said would be a "gamechanger" for the industry, but said the first step towards this would be developing a UTM roadmap.

At the HAC's annual general meeting, the association had three directors acclaimed: Jacob Forman of Yellowhead Helicopters, Sylvain Seguin of CHL, and Paul Spring of Phoenix Helicopters will serve two-year terms. Forman is serving his third consecutive two-year term, while Sylvain Seguin is returning to the board after a one-year absence. Prior to that, he served eight consecutive years.

HAC also presented several awards during the event, including the Honourary Life Member award to Sylvain Seguin of Canadian Helicopters; the Agar Stringer award (for outstanding contribution to the Canadian Helicopter Industry) to Lyle Watts of Heli-College Canada Training, Inc.; and Airbus presented its Innovation in Safety award to Niagara Helicopters.

The HAC's annual convention will return to Vancouver in 2019 and 2020, and it is inviting feedback from attendees to help prepare these events.

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# CHC Summit discusses leadership and safety

### **BY KIM HUTCHINGS**

Over 500 attendees and approximately 40 speakers from around the world came together Oct. 1 to 3, in Dallas, Texas, to take part in CHC's Safety and Quality Summit. This year marked the event's 14<sup>th</sup> edition, and was the second time it has been held in Dallas.

The summit's theme was, "Building safety at every level: does it start at the top or with front line employees?" Speakers included Francois Lassale, operations director at HeliOffshore; Benjamin Goodheart, managing director of Versant: and Dave Prior. an aviation consultant. The event included more than 80 breakout sessions, and CHC said it had received support from across the industry to make the summit possible.

The summit kicked off with Karl Fessenden, the president and CEO of CHC Helicopters, welcoming attendees and discussing the importance of the offshore industry continuing to work together to raise safety standards. "We need to adjust our focus and commit energy, time and money into developing safety leadership at all levels, not just at the top," he said. "Now is the time for a renewed leadership commitment to seeking, evaluating and implementing safety ideas."

With the support of several of the summit's sponsors, CHC recognized and rewarded several members of the rotorcraft industry in the form of grants and scholarships, providing transport to Dallas, accommodation, and entry to the Safety & Quality Summit as a full delegate.

Each year, CHC, with support from Scott Shappell and Doug Wiegmann of HFACS Inc., welcomes application essays from students for consideration for the Peter Gardiner Grant, named in honor of Peter Gardiner, an early supporter of the CHC Safety & Quality Summit. This year's Peter Gardiner Grant winner was Lucca Carrasco Filippo, an Aeronautical Sciences student from Rio De Janeiro, Brazil, studying at Unisul. In his application, Lucca stressed the importance of maintaining a just safety culture in an organization to help facilitate understanding behind human errors and accidents, noting that it takes a commitment from leadership to foster an environment where both front line employees and management can see human error as learning opportunities that can drive

organizational growth and safety improvement.

Sikorsky offered a similar opportunity for aviation students to be considered for the Sikorsky Safety Scholarship. The winner for this year's Sikorsky Safety Scholarship was Adam Tetzlaff, who is pursuing a degree in Aviation Technology at Seneca College near Toronto. In Tetzlaff's submission, he discussed the importance of an organization having a robust safety management system, explaining that management buy-in to a strong safety culture is essential to establishing a mutual trust between organizational leadership and lower level employees. This ultimately leads to a mutual investment in continued safety, he argued.

CHC also partnered with Collective Magazine to award two members of Whirly-Girls International with scholarship packages that included the conference attendance fee, flights, accommodations, meals and access to a two-day HFACS course that was held around the main conference. The two winners. Melissa Hanthorn-Shantz and Samantha Hansen, are both active pilots and flight instructors who said they were eager to take their learnings from the conference back to their respective companies.

Finally, the Southern California Safety Institute raffled off a free certificate program training that was won during the event by Universal Helicopters. The award was collected by Shane Cyr, the operator's CEO.

For the closing session, Duncan Trapp, CHC's vice president of safety and quality, invited the audience to participate via live interaction through their smartphones. The discussion included a short survey where the audience members responded to a series of questions and statements. The responses indicated that the audience believed safety was owned and driven by both senior leadership and the workforce; that frontline teams "occasionally" generate safety ideas and that they are generally encouraged by leadership to do so; and that the biggest blocker to advancing safety is culture, followed by money, time, and then competitive edge.

"Our aim next year is to get even more of the frontline teams to participate in the discussions and to be able to engage directly with the safety specialists presenting," said Trapp.

The 2019 Safety and Quality Summit will return to Dallas at the Omni Dallas Hotel, from Oct. 1 to 3. 2019.

# **RotorBits**



### **Donaldson IBFs approved** for new AW189s

Inlet Barrier Filters (IBFs) from Donaldson Aerospace & Defense can now be offered and installed as a factory option on new Leonardo AW189s, having achieved certification from the European Aviation Safety Agency (EASA).

The IBFs keep contamination, including dirt, dust, salt and foreign objects, from degrading the performance and reliability of the AW189's turboshaft engines and auxiliary power units.



**Meeker-Airfilm Photo** 

### **Meeker-Airfilm receives** approval for Robinson nose mount

Meeker-Airfilm has received Transport Canada approval for its Robinson R44 and R66 lightweight nose mount.

The nose mount requires no permanent modifications to the airframe and fits over the existing landing light cover.

The maximum payload is limited to 50 pounds (22 kilograms) and is intended for various camera systems, searchlights, lidar, and antennae.

The nose mount also has Federal Aviation Administration and European Aviation Safety Agency supplemental type certificates.

# Safran bets on hybrid propulsion

Hybrid propulsion systems are expected to contribute to the emergence of new VTOL (vertical takeoff and landing) and STOL (short takeoff and landing) aircraft. **Remy Bertrand Photo** 



### **BY THIERRY DUBOIS**

Safran Helicopter Engines is broadening its horizons to hybrid engines and new rotorcraft architectures, as well as digital services for its customers.

The Pau, France-based company is gearing up to equip Bell's vertical take-off and landing (VTOL) vehicle demonstrator for air taxi applications. The first ground test of a hybrid propulsion system took place in mid-July. Safran says it can support an entry into service in 2025.

The 100-kilowatt (130-shaft-horsepower) hybrid propulsion system Safran has ground-tested is based on the e-APU, an auxiliary power unit in service with the Leonardo AW189 super medium twin. Safran's system can feed the motors with electric current from the batteries and, for peak demand, directly from the generator.

The engine manufacturer plans to evaluate a 500-kW system over the next few months; it would be compatible with a four-passenger VTOL vehicle.

Meanwhile, for Airbus Helicopters' Racer compound helicopter, Safran is developing a second version of the 2,500-shp-class Aneto, the Aneto-1X. It shares a common turbomachinery with the Aneto-1K (in development for the beefed-up Leonardo AW189K). The hardware's differences lie in the engine mounts and accessory gearbox.

The engine control software is different, too, as the Racer will have distinct needs

in engine running speeds. The first ground test is scheduled for the fourth quarter of 2019, said Safran Helicopter Engines' CEO Franck Saudo.

Besides those futuristic developments, conventional engines and conventional helicopter architectures, which can be anticipated to remain the mainstay of the industry for at least a decade, are keeping Safran's engineers busy.

The Aneto-1K now has its EASA certification pegged for early 2019, instead of the third quarter of this year (as planned one year ago). Saudo did not have any comment on the delay. "The development is nominal, 4,000 ground test hours have been logged in addition to Leonardo's flight-test program," he said.

The 1,100- to 1,300-shp Arrano-1A will be EASA-certified early in 2019, and the first production example will be delivered in the first half of that year, according to Saudo. The program's schedule is thus slowly slipping to the right but remains consistent with the Airbus H160 medium twin program. The entry into service of the latter was, late last year, delayed to late 2019.

Arrano-1A certification testing is complete, said Saudo, after 7,300 hours of trials, including 1,600 in flight on the H160.

The 1,800-shp-class Ardiden 3C was EASA-certified last April, supporting the Avicopter AC352 program. The AC352 is the Chinese counterpart of the Airbus H175 super medium twin (under a 50-50 joint effort). Two Chinese companies — Dongan and Hapri, parts of the Aero Engine Corporation of China consortium — have contributed to the development of the engine, known in China as the WZ16. The AC352 first flew in December 2016.

Also in April, Safran received EASA certification of the 986-shp Arriel 2H, which powers the in-development Avicopter AC312E. The medium twin is similar to the Airbus AS365 Dauphin.

In customer support, the company is committed to offering more digital services. The latest in the offering is Expert Link, a new video assistance service. It allows the customer to connect with Safran Helicopter Engines experts through a live video feed. The goal is to facilitate technical diagnosis and guide them through a maintenance task. Expert Link features a secure datalink and is compatible with most smartphones, tablets, borescopes and smart glasses.

Among the first customers are Heli Austria, Heligo (the holding company of Mont Blanc Hélicoptères, Eagle Valais and Swiftcopters in France and Switzerland) and Florida-based Rotortech Services, Safran said.

Saudo describes the global helicopter market as undergoing "progressive recovery," including offshore oil-and-gas operations. This year, the production of approximately 900 engines is planned at Safran's factory – a 23 percent hike over last year. According to Saudo, a greater market share accounts for the increase.

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# Asia-Pacific leads industry growth

**BY THIERRY DUBOIS** 

The Asia-Pacific region has the fastest growth in the helicopter market, but hopes for strong expansion in China are slow to materialize, industry experts told seminar attendees at Helitech International 2018 in Amsterdam, the Netherlands.

"Asia-Pacific is really the growth region," said Ben Chapman, valuation manager, Flight Ascend Consultancy, during a session on global market trends. And the growth rate of mainland China's fleet, at 17 percent last year, "dwarfs anything else in the region," added Fabian Graebner, sales and commercial manager in Asia-Pacific for Waypoint Leasing. The company has moved its bureau from Singapore to Hong Kong to be closer to China. According to Waypoint, the Chinese civil helicopter fleet stands at 581. That number means, however, the increase is modest if measured in units.

Even so, whether this growth rate can be maintained is still to be determined. The Chinese government is not delivering on its repeated promises to open the country's lower airspace, which is still largely controlled by the military. It appears to want to control the speed at which the industry is changing, said Nadav Kessler, director, sales and business development for Hong Kong consultancy Asian Sky Group.

"There was a big hype in EMS [emergency medical services] a while ago, but operators realized airspace would not open as fast as expected," said Kessler.

EMS consists mainly of inter-hospital transfers, Graebner noted. He suggested the fleet might grow to 100 EMS helicopters in 2018, from 47 in 2017, and 20 in 2016. The offshore fleet is unchanged from 2016, at 63.

While light singles are the most popular category of aircraft in China, Waypoint has seen some recent activity with the Airbus H225. The type has otherwise been struggling to find civil applications since a months-long grounding in 2016. In China, it has been used in firefighting and utility roles, according to Waypoint. For an H225, Chinese customers are ready to pay more than a European customer, Chapman pointed out.

Overall, the Chinese market is maturing and a number of helicopters that came into the country on speculative grounds are now finding a home. Investors — as opposed to operators and end users — bought large quantities of helicopters a few years ago, Kessler explained. After having waited for a mission, they are now being used, he added.





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# Thales bets on China

### BY THIERRY DUBOIS

Thales is aiming at 2020 to start operations at the joint venture it wants to establish with Avicopter in China for a helicopter pilot training center.

As the memorandum of understanding was signed on Nov. 6, "we are just beginning," said Benoit Plantier, Thales vice president, training and simulation activities. Nevertheless, he suggested the joint venture may be incorporated in 2019 and activity may commence the year after.



The share of each partner in the company is not determined yet, but "the objective is for it to be balanced," he said. Thales has suggested the joint venture with Avicopter may be structured along the same lines as Helisim. The latter company, based in Marignane, France, is a joint venture and Airbus Helicopters and Thales are the main shareholders.

Avicopter will provide Thales with data to design flight simulators for three types — the AC312, AC313 and AC352. The AC312 medium twin resembles the Airbus AS365 Dauphin, and the heavy AC313 looks like the SA 321 Super Frelon, as Avicopter and its

predecessors have benefited from licenses issued by the European manufacturer. The AC352 is the Chinese version of the Airbus H175 - a joint program.

Given slower-than-hoped growth for China's helicopter operator industry, is Thales investing too early? "We might be one to three years too early, but we must be ready before the market starts actually growing — and once started, it will be fast," said Plantier. "Once the market [is] established and the players [are] in place, it will be too late."

# Offshore wind provides potential

### **BY OLIVER JOHNSON**

The global offshore wind market is experiencing "exponential growth," presenting huge potential for enterprising helicopter operators, a sector specialist told seminar attendees at Helitech International 2018 in Amsterdam, the Netherlands.

"The offshore wind industry is a growing, viable and sustainable industry — investing in it is investing in the future," said Khalid Kamhawi, lead of advanced engineering at Offshore Wind Consulting.

However, he said the onus is on helicopter operators to identify and take the opportunities for work. This is partly due to the sector's lack of maturity, and partly due to the nature of the turbines, farms, and the way they're operated.

According to Kamhawi, installed offshore wind turbines generated 4 GW of energy in 2015. By 2030, that will have grown to 100 GW. Most of this will be provided by wind farms in Europe, which are expected to provide 60 GW of power by 2030.

This jump in power output is due to an increase in turbine capability as well as the number of farms. Wind turbine generators

(WTGs) — the machinery that transform mechanical rotational power into electricity — are growing in size at a rate of 6.5 percent annually, which Kamhawi said would lead to a generator capable of producing 18 to 20 MW by 2030. He said about 650 households can be powered by 1 MW.

In the near term, WTGs that produce 12 MW — such as the GE Haliade-X — will be available by 2023. To put the size of such turbines in perspective, they are about as tall as the Eiffel Tower, with each blade 350 feet (107 meters) long.

"The actual underlying technology is evolving very quickly, but the support system is not there yet," said Kamhawi. "We need the supply chain to move as fast as the underlying technology."

And as farms grow ever larger in the size and number of turbines in use, having a robust maintenance program will become increasingly important — and it is in providing support during operation and maintenance that Kamhawi said the majority of opportunities for helicopter operators would exist.

While the energy provided by offshore wind farms is still currently quite expensive

per MW/h, it is declining in cost sharply. Kamhawi said he expected it to hit parity with nuclear energy in three years, and then be as cheap as gas within five years. And as the cost falls, investment will increase leading to ever larger windfarms built further from shore.

For the next five to 10 years, wind farms are likely to be kept close enough to shore to allow the power they generate to be sent directly to shore, said Kamhawi. "After that, you'll start to develop megafields, which are clusters of arrays, joined together by manned maintenance platforms and super substations that bring them all together," he added. "This is all good news for your industry, because these farms will definitely have manned structures."

Helicopters can be used throughout the lifecycle of a windfarm, from initial exploration, through construction to maintenance, but it's the latter that's likely to present the largest opportunity for substantial work for the helicopter industry, said Kamhawi.

"If the helicopter industry is able to engage with the offshore wind operators and understand their [operation and maintenance] strategies early on, it can provide betteroptimized [support]."

# Offshore oil-and-gas sees spend increase

### **BY OLIVER JOHNSON**

This year will see an increase in annual expenditure in offshore helicopter services for the first time in four years, according to new analysis unveiled during a conference session at Helitech International 2018 in Amsterdam, the Netherlands.

"It's nice to be able to stand in front of the industry at a conference and say we are past the bottom of the downturn — we are seeing activity starting to pick up," said Steve Robertson, director, head of oilfield services at Westwood Global Energy Group, as he presented the findings.

"We're now starting to see the green shoots of recovery in the big markets. In the North Sea we're seeing day rates starting to trend upwards, particularly in Norway, and also in the U.K. as well."

However, he cautioned that the recovery would not involve a dramatic return to the levels of activity seen before oil prices plummeted in 2014.

"We're not expecting a 'hockey stick' type of recovery in the next few years; we're expecting a fairly slow recovery in terms of expenditure as that recovery ramps up," said Robertson.

According to Westwood's figures, this will see about \$7 billion of spending on offshore helicopter operations over the next five years — or roughly 10 million passenger journeys a year. The bulk of those journeys will be for production operations, with the average distance from shore for installed platforms continuing to increase from the current average of 70 miles (113 kilometers).

Over that five-year timeframe, Westwood expects 118 new medium and heavy helicopters will come into service. However, both the medium and heavy global offshore fleets will continue to battle the problem of oversupply.

"The market is evolving favorably for the oversupply chain . . . [and] we do expect high levels of investment," said Robertson. However, he added that higher oil prices are not yet resulting in better commercial conditions for service companies.

Looking ahead, the offshore transport industry should expect to see growth in demand away from the traditional oil-producing areas. "[It's] going to come from areas that we've not really seen before in the offshore markets — the South China Sea and Australia, Southeast Asia, and the eastern Mediterranean," he said.

In terms of the overall outlook for the oil-andgas industry, Robertson said the general consensus among industry analysts it that oil prices will remain flat to 2024. The Baker Hughes Rig Count shows a recovery in onshore activity, but the recovery of rig numbers offshore is "muted and delayed."

New project investment will increase to \$95 billion in 2018, from \$60 billion in 2017. Much of that investment is for projects in Western Europe and East Africa, Robertson added.

There are currently 1,500 wells being drilled in shallow water, compared to a peak of 2,500 wells. Westwood expects some recovery in the number of wells being drilled in shallow waters — mostly through an increase in activity in the Middle East.

Deepwater drilling will see far less reliance on the "Golden Triangle" of the offshore oil-producing regions of the Gulf of Mexico, the Gulf of Guinea off West Africa, and Brazil. A more global spread of deepwater activity will be fostered through the development of areas in East Africa, off the coast of India, and the South China Sea.



# **RotorBits**



### Bell launches Certified Training Facilities

Bell has launched Certified Training Facilities (CTFs) to expand its global training offering. The company said CTFs such as Helideal, a Bell Independent Representative based in southern France, will provide the highest standard of initial and recurrent pilot training under the umbrella of the Bell Training Academy.

"The Bell 505 has been a global success story for Bell," said Patrick Moulay, senior vice president, Commercial Business – International. "With a rapidly growing Bell 505 international footprint, we are focused on providing local support solutions to our international customer base for the entire lifecycle of their aircraft, and CTFs will play a key role."

### Kaman receives orders for 2 K-MAX aircraft



Kaman Aerosystems has received orders for two additional K-MAX helicopters, and the manufacturer has announced it has approved continuous manufacture of the aircraft with the authorization of Lot III production.

Mountain Blade Runner Helicopters of Montrose, Colorado, will become the newest K-MAX operator, utilizing the aircraft to support high-altitude, external-lift operations and firefighting missions.

St. Louis Helicopter of Sellersburg, Indiana, will also expand its fleet with the addition of a K-MAX. The aircraft will be used for agricultural aerial solutions, such as seeding, fertilizing and firefighting, where the increased lift capacity will expand the company's overall capability.

# Airbus energizes powerline symposium



The fifth Airbus International Powerline Symposium was held in Vancouver, British Columbia, on Oct. 31 in conjunction with the Helicopter Association of Canada's 23<sup>rd</sup> annual convention and helicopter safety forum.

"The goal of the symposium is to bring all of the industry experts — regulators, construction companies, operators — everyone who is involved in this industry to come together to share thoughts and ideas, looking to make the industry better, safer and more efficient," said Travis Latiolais, sales manager, oil-and-gas and utility for Airbus Helicopters.

With over 125 people registered, the symposium has grown in popularity every year and is open to everyone in the industry. Latiolais explained that Airbus works to keep the annual symposium relevant and reflective of current industry issues.

"This year, we've concentrated on human external cargo operations and hook compliance," said Latiolais. "The main focus is to drive safety and collaboration between everyone in the industry."

Interactive presentations included operational profiles from powerline helicopter operators San Diego Gas & Electric and Airtelis; the economics of light versus medium/heavy helicopters in powerline construction, given by Régis Magnac, head of customer operations for Airbus Helicopters; and intensive technical workshops and panels covering HEC hook compliance and rigging standards.

Keynote speaker Clint Mowbray reflected on his 27 years in the Royal Canadian Air Force (RCAF) as a search-and-rescue helicopter pilot. Now, as senior field manager for BC Hydro's aircraft operations department, Mowbray is bringing his experience with the RCAF's "world's best" safety culture to the utility company's operations.

"Aviation isn't inherently dangerous, but it's inherently unforgiving when things go wrong," said Mowbray.

He reviewed the importance of the "four pillars" of a safety management system (SMS), that include a commitment to safety by the owner and operator; recorded safety management processes aimed at setting safety goals, identifying hazards, and investigating incidents and accidents; properly trained and empowered safety staff; and a healthy, non-punitive safety culture.

Rather than placing blame, the importance of assigning a cause to an incident is a key to "get an SMS from a document on the shelf to a living and breathing part of our organizations," said Mowbray.
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Over 125 people attended the Airbus International Powerline Symposium, sharing ideas on how to make the industry safer and more efficient. **Heath Moffatt Photo**  And a "pat on the back" can go a long way. "I would highly recommend publicly praising your employees on safety. It's a great influence on your safety culture."

Continuing the safety theme, in his presentation about risk assessment and SMS, Marc Schoenrank of Great Slave Helicopters cautioned operators to not fall into the SMS analysis trap. "The absence of negative events does not mean we are achieving our safety goals. Are we counting what we can count or are we counting what counts?"

Du Guihe, general manager of the State Grid General Aviation Company (SGGAC) in the People's Republic of China, made it clear that safety is as important at SGGAC as it is worldwide.

"I'm here today to offer an invitation to all of you here, Airbus Helicopters and friends. I would like to find a solution to a development plan with you for long-term cooperation and collaboration. I believe we must reach the goal to drive helicopter operations to a higher safety position with all of our efforts, together," said Guihe, through an interpreter.

He presented an overview of his company's remarkable scope of helicopter operations to support the power grid system in China. China has 613,293 miles (987,000 kilometers) of power lines, including 167,770 miles (270,000 km) of ultra-high voltage lines. More than 2,858 miles (4,600 km) of the grid is in remote and inhospitable regions, at an average altitude of 13,125 feet (4,000 meters). "The highest tower is at 5,295 meters [17,370 feet] — it is the most challenging environment for helicopter operations in the grid industry," said Guihe.

In a look at the "Changing Industry," the symposium's closing panel fielded questions and prompted discussion about regulatory issues. The FAA's Kevin Morgan, Fred Jones of the Helicopter Association of Canada, Chris Martino of the Helicopter Association International, and Cameron Clark, Infinion Certification Engineering covered topics including "soft goods" or PCDS harness certification in Canada, and the operational certificate status of restricted-category, ex-military aircraft flooding into the U.S. market.

The symposium was a success, with a full, engaged room from the early first session to the evening's last panel. "At the end of the day, Airbus is the sponsor, but this is for the industry — it's the industry's symposium," said Latiolais.



## Kopter begins SH09 P3 flight tests



#### **BY OLIVER JOHNSON**

Swiss manufacturer Kopter has begun flight testing the third prototype (P3) of its SH09 light single aircraft, with a target certification by the end of 2019 still in sight.

The prototype's first flight lasted about 40 minutes at the manufacturer's facility in Mollis, Switzerland. The flight test schedule included a series of maneuvers aimed at obtaining preliminary flight data, validating test design features, and evaluating flight qualities, Kopter said.

The aircraft is to continue its flight test campaign in Sicily during the Swiss winter, and it will ultimately be joined by a fourth prototype/ pre-serial aircraft (PS4) to complete the type's certification flights.

In a wide-ranging media briefing ahead of Helitech International 2018 in Amsterdam, the Netherlands, Kopter CEO Andreas Loewenstein and CTO Michele Riccobono confirmed PS4 will be "fully representative" of the production aircraft, incorporating the Garmin G3000H avionics the manufacturer announced it was switching to in May 2018.

Another difference between P3 and PS4 is the type of carbon fiber used in the construction of the airframe, with the type used in PS4 providing enhanced durability.

Having solved an issue with a main gearbox component that had delayed the type's

development by about six months, Kopter completed an extensive ground testing campaign with P3 to clear the way for the aircraft to begin flight tests.

PS4 was originally due to join the flight test campaign by the end of 2018, but with the delays in preparing P3 for flight, it is now scheduled to do so by the end of the second quarter of 2019. This is to enable the manufacturer to gather data from P3's early flight tests before it freezes PS4's design, said Riccobono.

"We have a couple of points [on which] I need some answers from P3," he said. "Some systems may need some tweaking, and then before certification we [will] put the same systems on the two aircraft so that they will run in parallel."

#### MAKING MOVES AT HELITECH

Kopter now has 65 orders and about 100 letters of intent for the SH09, which is pitched as providing the cost benefit of a single-engine aircraft with a cabin the size of a light twin-engine aircraft — enabling it to accommodate up to seven passengers. It also incorporates some of the most modern technologies and materials available.

The manufacturer brought the aircraft to Helitech in the form of its first prototype, which was presented in the livery of new customer Systematic Aviation Services (SAS), based in Kuala Lumpur, Malaysia. Kopter has secured a number of bookings in Asia, but the newly-announced deal marks a debut for the aircraft in Malaysia.

"[It's] an important order because the Malaysian market is quite a dynamic market, and they are one of the dynamic actors in this market," said Loewenstein. "So, we consider that this is a good first step into this market."

Kopter believes orders from customers in Asia — excluding China — will account for about a quarter of its total sales, with tourism and passenger transport flights in the region likely to grow substantially. This belief doesn't appear misplaced, given that the region already represents a quarter of the SH09's order book.

Loewenstein said he was happy with the overall balance of the book, which he said represents "exactly the distribution of the global [civil helicopter] fleet." That balance is also reflected in the spread of orders per operating sector for light singles — across tourism, utility, law enforcement and emergency medical services (EMS). Mock-ups of the aircraft in EMS and law enforcement configurations were brought to the Heli-Expo and APSCON tradeshows, respectively, earlier this year in partnership with Shreveport, Louisiana-based Metro Aviation.

"[The order book] shows, to me at least, that this aircraft is really suitable for all the mission types we are targeting," said Loewenstein. "So, it's a true multi-mission aircraft which is fulfilling the requirements in all the areas where we targeted."

Helitech also saw Kopter record a bumper order from Swiss Helikopter Norway AS for four SH09s. The newly-formed company, a spinoff from Helitrans with the same shareholders, was named Kopter's Nordic distributor (covering Denmark, Norway, Sweden, Finland, Iceland and Greenland), and its founders said they expect the aircraft will mostly fill a need in sling load operations. The aircraft are scheduled for delivery in 2021-22.

The company is Kopter's eighth distributor in a fast-growing network that the manufacturer hopes to ultimately expand to "double digits," said Loewenstein. The network already spans Australia and New Zealand, Japan, Central America, South Africa, Eastern Europe and Northern Europe. "Our sales philosophy is that we will rely heavily on distributors for single orders," he said. "We will cover, ourselves, major fleet customers, and

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we will have [the ability] to cover military or paramilitary business ourselves."

In parallel to the expansion of its distributor network, Kopter is busily developing its product support program, which involves the establishment of a core team at the manufacturer's headquarters as well as the deployment of service centers around the globe. Many of the distributors are likely to also serve as service centers.

As part of its efforts to build its support program, Kopter is building what it says is an "extensive" training services offering together with "recognized, international" partners. Loewenstein ruled out using a simulator for training at the beginning of the program, but promised "innovative approaches" that would be revealed next year.

#### A GRADUAL PRODUCTION RAMP UP

The orders Kopter has received to date almost cover the first three years of production, with the manufacturer planning to "gear up quite slowly" when it begins deliveries of the SH09 — scheduled for "just after" certification is secured in the first quarter of 2020.

Four aircraft will be produced in the first year, 18 in the second, and 44 in the third. Beyond

that, it aims to reach "triple digit" numbers at its production line each year, said Loewenstein. "The cruising speed would be somewhere between 170 and 220," he added, saying the likely limiting factor for deliveries would be Kopter's capacity to produce more, rather than a lack of demand.

The building for the final assembly line in Mollis has been completed, and Kopter is now in the planning and authorization process for its final pre-assembly and manufacturing building; Loewenstein said there is a "high probability" this will also be in Mollis.

The manufacturer had previously announced the creation of a U.S. subsidiary, Kopter North America, which will focus on boosting the aircraft's presence in that key market. North America is expected to provide close to 50 percent of the aircraft's sales.

The subsidiary will also have a final assembly line, with the site to be selected within the next six months. A third final assembly line is planned for Asia. Production of all dynamic components will remain in Switzerland, said Loewenstein.

In the meantime, the company has been busily growing in size to accommodate the change from prototype designer to airframe manufacturer. It now has almost 300 staff, many of whom have joined the company having gained vast experience across the helicopter industry.

"We've united quite an interesting team, and all these ladies and guys [are] bringing innovative ideas," he said.

Kopter's production facilities will be kept lean, with an estimated 250 to 300 staff to be added in Switzerland over the next three years as manufacturing ramps up.

"This is a great window of opportunity for this product at the moment, and I think this is very motivating for the team," said Loewenstein.

He hopes to utilize the expertise of Kopter's growing team as the manufacturer begins to plan beyond the SH09, with a previously stated aim of becoming one of the top three civil helicopter manufacturers.

"When you have one helicopter and you have established a great team of people who have done it, it would be a pity not to use this knowledge and to use this dynamic in order to get one step further," said Loewenstein. "You cannot stay a little niche player in the corner. . . . If you want to be sustainable, then you have to have more than one product at this scale."



## A Time to Heal

With a beautifully restored Bell UH-1H Huey and a lovable Belgian Malinois, the California-based nonprofit EMU, Inc. is helping veterans come to grips with the traumas of the past.

BY ELAN HEAD // PHOTOS COURTESY OF EMU INC.





## Waypoint files for Chapter 11 bankruptcy protection

#### **BY OLIVER JOHNSON**

Waypoint Leasing filed for Chapter 11 bankruptcy protection on Nov. 25, citing the major downturn in the offshore oil-and-gas sector and CHC Helicopter's own bankruptcy restructuring process as major contributory factors.

At the time of the filing, Waypoint was the largest independent helicopter leasing company in the world; with a fleet of 165 aircraft, it had assets of \$1.62 billion.

However, it also had liabilities of \$1.23 billion, with 35 aircraft not on lease, and another five on leases that are due to expire before the end of 2018.

In a press release announcing the filing, Waypoint said it expects to move through a restructuring process "as expeditiously as possible," and revealed it has been undertaking a "comprehensive sale process" over the last few months. It said it has received several bids and will use the Chapter 11 process to complete the sale.

"Waypoint's Chapter 11 filing is the next step in our holistic transformation strategy and will provide us with the opportunity to emerge with a stronger. sustainable and more competitive balance sheet," said Hooman Yazhari, chief executive officer of Waypoint, in the press release. "We will also continue our intense focus to deliver on the needs and requirements of our customers."

According to a deposition from Todd Wolynski, Waypoint's general counsel and chief administrative officer, 73 percent of the leasing company's aircraft net book value was from assets servicing the oil-and-gas industry. This left the company vulnerable to the impact of the ongoing downturn in the oil-and-gas sector, which hit in 2014 - the year after Waypoint was founded.

"The downturn in the oil-and-gas industry that started in 2014 is what's really led to the filing," said Sara Tapinekis, a legal analyst at financial research firm Debtwire. "It's the single most relevant factor."

She said that as a result of the downturn in



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John Belonzo john@helitradesalliston.com the oil-and-gas industry, operators have been cost-cutting through reducing fleet sizes and negotiating better leasing terms. "Although the [oil-and-gas] industry's slightly coming back. there's still this overabundance in the market of aircraft, and I think that's going to be one of the biggest hurdles for the company [going forward]," said Tapinekis.

It was also heavily reliant on CHC Helicopter, to that extent that at the time of the operator's filing for its own Chapter 11 process in May 2016, CHC accounted for 53 percent of Waypoint's revenues with 44 aircraft on lease from the company, according to Wolynski's deposition.

CHC rejected 15 of those aircraft and renegotiated the remaining leases with "less favorable terms" for Waypoint, leading to loss of \$45 million in revenue per year for the leasing company. It was also hit with \$28.4 million "in unexpected transition and maintenance costs" due to rejected CHC aircraft, Wolynski said.

At the time of Waypoint's filing, it had 36 lessee customers in 34 countries. Its fleet was composed of 25 heavy, three super medium, 73 medium, 41 intermediate twin, and 23 light helicopters.

Wolynski's deposition pointed to an oversupply of helicopters in the market, which saw Waypoint's revenues drop 12 percent from 2016 to 2017. He said this decline continued to accelerate in 2018. At the time of Waypoint's filing, it said its fleet utilization was about 78 percent, down from 94 to 100 percent between 2013 and 2015.

With the downturn, Waypoint attempted to diversify its business away from oil-and-gas, growing its customer base from 16 customers in 2016 to 36 customers at the time of the filing. However, Waypoint's current lease terms are expiring "with significantly fewer lease extensions in the oil and gas sector than there have been historically or would have been expected at this stage of prior oil and gas industry downturns," said Wolynski.

Wolvnski's deposition also revealed that Waypoint was in negotiations for a sale to a Chinese company from November 2016 to January 2018. The move even received Chinese regulatory approval, but the purchaser was unable to close the transaction.

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#### Bruno Even, CEO of Airbus Helicopters



**A & C** 

Bruno Even was appointed CEO of Airbus Helicopters on April 1, 2018. He joined the company from Safran Helicopter Engines, where he held various management positions — including serving as the engine manufacturer's CEO.

## **VERTICAL:** How have the first few months been at Airbus?

**BRUNO EVEN:** Exciting! It's an exciting moment for our industry when you look at all the challenges we have in front of us. It's quite a challenge, but at the same time, we have some good prospects.

### V: What were your priorities when you joined the company?

**B.E.:** My first priority was to understand where we are on the markets. It's true that the market, when it comes to helicopters, has been quite challenging for the last three or four years. But Airbus Helicopters has, I think, quite a good position. When I look at the past two or three years, we're slightly, but continuously, increasing our market share. For me, this is a demonstration of the resilience of our business model.

Clearly, the area where we want to focus our energy and investment is on customer satisfaction, customer loyalty. The feedback we have from the market is that we have made a lot of progress in terms of performance, but we are not yet where the market expects us to be. So we need to continue to work in terms of performance, in terms of reliability of our product, in terms of quality, in terms of time of delivery. So customer loyalty is one of the first priorities.

My second priority is innovation. It has always been in our DNA. We are convinced that Airbus Helicopters, through innovation in products and services, can continue to bring value to our customers. That doesn't mean bringing a new helicopter on the market every day, it means continuing to invest in the current helicopter portfolio to improve their performance, to bring more value to the 135, 145, 175. Our innovation is also shown in the H160.

## **V:** How is the H160 performing so far?

**B.E.:** The 160 is an amazing aircraft. When we look at where we are today, it matches what we had in mind when we decided to launch this aircraft in terms of performance, comfort, and design. We're at a little less than 1,000 flying hours across the three different prototypes. The customers who have already flown with this aircraft, they are impressed by the performance, by the comfort of the helicopter, and by the very low level of noise, which is unique today on the market. To have an aircraft able to address different kinds of segments, from oil-and-gas, to VIP, to EMS - it's really the multi-role helicopter that we imagined since the beginning. The feedback that we see from the market - we started to market this aircraft at end of last year - it confirms this capacity.

#### V: When are you looking at certification?

**B.E.:** By end of 2019. The first delivery is planned for 2020.

## V: How many orders do you have so far?

**B.E.:** At the end of Q3, we had booked 10 H160s.

#### V: Are you happy with this number? Is it where you expected to be?

**B.E.:** It is quite in line with what we expect, having only started to market and

discuss with our customers at the end of last year/early this year. We performed a demo tour in the U.S. to demonstrate the capability of this helicopter for different segments. The feedback is very positive and we have many different discussions with operators. When we look at the global momentum of the market and the feedback we received, yes, I'm quite optimistic and positive about the prospects for this helicopter.

#### V: You mentioned earlier the company's resilience. What do you think has led to this?

**B.E.:** I think there are four key reasons. The first is clearly the fact that from the beginning when we think about a new helicopter, it is to address both civil and military markets. I think this has really been a strength with the challenges in the civil market over the last two to three years. For example, the Super Puma, the 225 — heavy helicopters have been quite challenged with the offshore market, and that's for all the industry, not only for us. At the same time, the last year has been the best year in terms of bookings for the 225 for the military market.

The second reason is the balance we have between services and selling new serial aircraft. We are quite strong with 45 percent of our activities focused on support and services. We have 12,000 helicopters in service, so service is a key pillar of our business model.

The third reason is our international footprint. Our proximity to customers is at the core of our strategy, and to have this international footprint gives us, when there are some challenging times in some regions, opportunities in other parts of the world where the market is quite positive.

Last but not least, we have a large range of the products. With the certification of the H160 we plan for the end of next year, we will clearly be in a position to address any requirement from light single to heavy. It gives us resilience.

#### V: How has the H175 been performing in terms of sales and out in the field?

**B.E.:** Last year has been a good year for the 175, so we are quite positive in terms of bookings, and we are quite

positive about what the aircraft can bring to the market. But the market is challenging — particularly the oil-and-gas market. The overcapacity we see globally is on the heavy segment. In terms of performance and competitiveness compared to heavy helicopters, the 175 is clearly, from my perspective, the right solution for the market.

#### V: What is your perception of the 225 in the market now? Where does it stand in oil-and-gas, and what do you think its prospects are outside of that sector?

**B.E.:** When I referred to the resilience of Airbus, I mentioned one of the key points is to be able to address different requirements of the market. That is clearly one of the strengths of the 225. It is designed to address different types of segment - military, oil-and-gas, parapublic and so on. The 225 is still flying for sure in oil-and-gas, as we see in Brazil and China - but that's not where we see the main prospects for today and for the short- or mid-term. This is because I don't expect a major recovery in the next 18 months or two years in oil-and-gas. That's why we are working hard to continue to promote the 225 in other segments. It's the case for the military segment, where we continue to have good results this year in terms of selling the 225, but we have also the challenge to repurpose and to find alternative markets for the 225s that are not being used in the oil-and-gas market. We are working with some partners in order to repurpose these 225s on utility missions, firefighting, and search-and-rescue. That's one of our priorities.

#### V: Airbus is working on several different fronts with Urban Air Mobility, Racer, and various unmanned platforms. It must be quite a challenge balancing those efforts.

**B.E.:** That's why it's so exciting! Innovation has always been in the DNA of Airbus Helicopters. We have always been in a position to provide value to market based on new technologies. We are still convinced at the same time that the priority and our commitment to the market is to continue to improve the current product. That's what the market expects from us, in particular in this challenging period, to continue to bring competitiveness, to continue to bring performance and availability, but also to prepare and to think about what the future could be. It doesn't mean that it will come tomorrow, but it is our responsibility as an OEM to prepare this next step and to be ready to launch a program when there is a need. Probably not at this point for these different technologies, but we need to prepare.

## **V:** Are there any gaps you see in the market right now?

**B.E.:** To be frank, when it comes to Airbus Helicopters, no. I'm convinced

that with the H160 we will be in a unique position to be able to offer competitive and state-of-the-art solutions from the light single H125 and H130 — which are very competitive platforms — to the super medium/ heavy 175, 225 and NH90. One of our key pillars is to have a product portfolio to be able to address the needs of the market from the light to the heavy. I think that with the H160, we will be in that position.

This interview has been edited and condensed.



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# PHOTO CONTEST

This is now the 10<sup>th</sup> year that we have held our annual photo contest — and what a decade of spectacular photography it has been. The contest has grown a lot over the years, drawing entries from some of the most talented aviation photographers — and hobbyists — from every corner of world. It has become a real celebration of both photography and the wonder of rotary-wing flight, providing us with unique perspectives on the extraordinary work you — our readers — do, day in and day out.

This year, we received well over 1,000 entries, and picking the best of the bunch was as hard as ever, with the quality, as always, being extremely high.

We're proud to reveal that this year's Grand Prize winner is Maciej Mikiewicz — a 28-year-old anesthesiology resident and mountain rescuer from Zakopane, Poland. You'll have already noticed his amazing photograph of a PZL W-3A performing a mountain rescue on our front cover, as well as alongside this column. Many congratulations to Maciej, and all the winners across the three competition categories and our Readers' Choice award.

The contest was free to enter, and open to any amateur or professional photographer over the age of 18. We accepted entries through our website from Aug. 27, 2018, to Oct. 26, 2018. Each entry was submitted, without the photographer's details, into a digital folder, and also appeared on our website for voting for the Readers' Choice competition.

We took a look through all the entries, and picked 10 finalists in each of the three competition categories (Beauty Shots in the Field, Helicopters at Work, and Military).

We then handed it over to our sponsors: Bell Helicopter, Airbus Helicopters, Airwork, Metro Aviation, PHP, Safran Helicopter Engines, and Wysong Enterprises. Their representatives, along with *Vertical* staff, voted through a secure website for their three favorite photos in each category, and the votes were tallied automatically. Maciej's photo secured the most votes, and has won the Grand Prize of a Hamilton Khaki Aviation X-Wind Watch (worth US\$1,850) and appears on this issue's front cover. The first-, second-, and third-placed photographers in each of the three competition categories have won prizes of \$750, \$500, and \$250, respectively.

Our Reader's Choice winner was decided by voting on our website, which was open to all website visitors. The one photo that secured the most votes was declared the winner, taking the prize of \$500.

You can see all the competition winners over the next few pages, and if you'd like to see some more of the amazing photos we received, take a look at the online edition of this issue for a selection of honorable mentions.

Thanks to everyone who took part in the contest, and to all our photo contest sponsors for their support.



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#### MACIEJ MIKIEWICZ

NNER

Maciej Mikiewicz, 28, is an anesthesiology resident and mountain rescuer from Zakopane, Poland. He spends his free time climbing and backcountry skiing with his camera Since his first helicopter flight at five years old, he says he always has his eyes glued to the machines whenever he sees them.



A P2L W-3A Sokol, operated by the Tatra Mountain rescue service (TOPR) files a rescue mission on Rysy, the highest peak in Poland. Located in the Tatra Mountains in southern Poland, Rysy reaches 8,199 feet (2,499 meters). This photo was taken on Sept. 9, 2018, as the service responded to information it received about a hitchhiker who fell from a trail. Although the hitchhiker only sustained minor injuries, they were stuck in very steep terrain and required the highly-skilled help of TOPR's pilots and rescue personnel to reach a hospital. FIRST

## **BEAUTY SHOTS IN THE FIELD**

PLACE

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#### ➤ ADRIAN BRETSCHER

HR-7M

Swiss photographer Adrian Bretscher, 28, says it was always his dream to fly a helicopter. He has held his private pilot's license for two years, and flies an MD 530. He takes pictures for the Fuchs Helikopter company.



Fuchs Helikopter's brand new Airbus H125 returns to base after a day in the field. "It was a beautiful sunset flight home after a long day working in the Swiss Alps . . . so we decided to do some nice photographs of the new fleet member in the autumn light," said photographer Adrian Bretscher.





### SECOND

## **BEAUTY SHOTS IN THE FIELD**

PLACE

#### YORK GALLAND

York Galland is a pilot and photographer, offering aerial film and photo work through iflyheli. He owns and operates a Robinson R66 and a Bell 505 Jet Ranger X, and has almost 100,000 followers on his Instagram account @iflyheli.



The Milky Way illuminates the night sky above a resting Bell 505 Jet Ranger X. The aircraft's owner, York Galland, took this shot in early October 2018 with the Sony a7rM3 camera on a tripod with the Sony 16-35 2.8 lens (25 second exposure, 10,000 ISO, f/3.5, 16mm). "The photo was taken after an unplanned landing in Southern Utah," he recalled. "While en route from northern Utah to a photo shoot in Arizona scheduled for the following day, the presented of the provide the presented of the presented of the provide the presented of th I encountered - worse than forecasted - heavy rains and low visibility. I chose to 'land and live' and spent the night in the helicopter. After hours of listening to the pounding rain and eating every candy bar I could find in my luggage, the storm broke to this celestial scene.

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#### ► KIM FLAMENT

Kim Flament, 30, has been working as a pilot in the Canadian helicopter industry for 10 years, and took this photo when employed as an advanced flight instructor by Topflight. "Flying offers unique perspectives and occasions to take great shots," he said, so he always takes a camera with him.



A trainee from the German army lands a Bell 407 at 9,446 feet on Mount Burnham, near Revelstoke, British Columbia, during training with Topflight in the winter of 2017. Topflight is one of the most renowned advanced helicopter flight training centers in the world.

# BEAUTY SHOTS IN THE FIELD

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### FIRST ELICOPTERS AT WORK PLACE

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An Airbus H125 operated by Chamonix Mont Blanc Hélicoptère (CMBH) and flown by the company's owner, Pascal Brun, works on the Mont Blanc tramway in France last autumn. "That day, we sank 10 cubic meters [350 cubic feet] of concrete at an altitude of more than 2,200 meters [7,200 feet] with the H125 of CMBH," said photographer Ben Grelier. "Often having my camera at work, I took advantage [of the opportunity]."

#### BEN GRELIER

Ben Grelier, 28, has travelled around the world with his work, giving him the opportunity to meet pilots and others working in the helicopter industry — and taking photos of aircraft both from the ground and air-to-air. He says he loves sharing his photography with those who are passionate or curious about the industry.



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#### PRZEMYSŁAW PIEGZA

In addition to his work as a photographer, Przemysław Piegza, 43, a is a ski instructor. He lives in Zakopane, Poland.

A PZL W-3A Sokół, operated by the Tatra Mountain rescue service (TOPR) flies a rescue mission in the Tatra Mountains in southern Poland. Despite it being May when this photo was taken, the aircraft still requires skis to operate along the mountains' snow-covered slopes.

## HELICOPTERS AT WORK

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## 

THIRD -

#### > JAKE LANG

Jake Lang, 28, is originally from Wisconsin, but has been working as a wildland firefighter on the Wyoming Hotshots for the past four years. He's a sawyer (a chainsaw operator) on the crew, and says he keeps a GoPro Hero 6 Black in his pocket during fire season to take photos "when I see something cool." He posts them to his Instagram account: @honeybadger\_x



Two Wyoming Hotshots are caught in the rotor wash of an Airbus H125 performing bucket drops on the Stove Fire outside Grand Junction, Colorado, in July 2018. The pilot is Scott Mahon of Papillon Helicopters. "I was expecting to just take a photo of the bucket drop that day, but the rotor wash turned up the ash and we couldn't see anything," said photographer Jake Lang. "I took this photo completely blind and just got lucky!"





## FIRST MILITARY SHOTS PLACE

#### JESÚS ANGEL LÓPEZ GRANJA

Jesús López, 53, was born in Asturias, a small region in northern Spain. He lives near Madrid, where he works in IT support for small businesses, and is an aviation and military enthusiast. He is part of the AIRE association, which frequently organizes trips to aeronautical museums and airshows in Europe. He travels abroad to three or four airshows each year.



A Westland WAH-64 Apache, operated by the British Army Air Corps, emerges from clouds of billowing smoke during an airshow in Yeovilton, U.K. "I was lucky to be located in the center of the display box and be stable pointing to the Apache when the pyrotechnics suddenly started," said photographer Jesús López. "The combination of the zenith sun and the black background made the rest."



# MILITARY SHOTS

#### ► TOM HOUQUET

Tom Houquet, 33, has been passionate about aviation and photography since his childhood, growing up next to Koksijde Air Base in Belgium. He has worked as a helicopter engineer for the Belgian Federal Police Air Support Unit for over 10 years, and tries to combine his job with his hobby. He is also a flight engineer, Bambi Bucket and hoist operator.



A Belgian Air Force Agusta A109BA shoots flares over the Pampa military training range in Belgium. The helicopter was flown by the Belgian Air Force's demonstration team, who perform at airshows all around Europe. The photograph was taken on Sept. 10, 2018, from the open ramp of a Short SC.7 Skyvan.

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#### A Polish Army Mil Mi-17 and two Mi-24s take part in a joint training flight in the Tatra Mountains in southern Poland. The picture was taken in 2017 as part of an aerial project for the 100<sup>th</sup> anniversary of Polish military aviation. It shows an "Afghan formation," in tribute to the Polish military contingent aviation unit in Afghanistan, where each flight of transport helicopter Mi-17s was accompanied by two Mi-24 attack helicopters. "Our aim was to make a late afternoon flight with backlight to highlight the helicopters' full rotor discs," said photographer Filip Modrzejewski.

#### FILIP MODRZEJEWSKI

Filip Modrzejewski is chief editor of Foto Poork aviation portal. He has accumulated more than 350 flying hours on air-to-air photography assignments, and his resulting photos have been published in many magazines around the world. He is currently completing an MSc in aerospace engineering at the University of Manchester.







As a helicopter flies over the desert in Chad in North Central Africa, a small boy watches on in fascination. **Idiart Xavier Photo** 



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## HONORABLE MENTIONS





Monroe County Trauma Star's chief pilot readies the organization's Sikorsky S-76C+ for flight. David Wiegman Photo

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The sunrise illuminates the photographer's wingman and an amazing vista following a combat mission in Logar Province Afghanistan. Bobby Triantos Photo





























With an ever-increasing number of former U.S. Army Black Hawks appearing in the commercial world, we look at the growing pool of modifications available to help tailor them to their new roles. **BY DAN MEGNA** 

<u>IODHY</u>

Operated by Timberline Helicopters, this Sikorsky UH-60A+ is one of more than 40 Black Hawks being flown by 28 operators in the U.S. **Ammy Jorgenson Photo** 

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A Black Hawk in operation with Leading Edge Aviation in South Africa. This aircraft was just the second of the type to enter civilian service outside of the U.S., and is primarily used for firefighting. Lloyd Horgan Photo

Since entering service with the U.S. Army in 1978, Sikorsky's UH-60 Black Hawk has earned an esteemed reputation among military operators around the globe. Its versatility, durability and performance make it highly adaptable to a wide variety of missions. Sikorsky's S-70 is the commercial variant of the UH-60 Black Hawk. While it has always been available to domestic operators, its cost and restricted category has limited its commercial acceptance. But the S-70 has proved popular in the export market with foreign governments for military and public safety missions and VIP transportation.

In spite of its costs and operational limitations, the Black Hawk has many alluring qualities for commercial operators. It possesses everything they want from an aircraft: speed, lift, safety, requires limited maintenance, and is a reliable, proven multi-mission workhorse.

In the mid-1990s, Brainerd Helicopters (now Firehawk Helicopters) purchased a low-time S-70 that had been in storage overseas, becoming the first domestic commercial operator of a Black Hawk. After a comprehensive overhaul, the aircraft entered service in 1996 on a firefighting contract in the Western U.S. The company acquired a second S-70 in 2001 from Sikorsky, a "trade-in" from a foreign government.

In 2014, as the Black Hawk passed 35 years of military service, the U.S. Army began a program to divest a large number of "obsolete and non-excess" utility Black Hawks. The Black Hawk Exchange and Sales Team (BEST) program administered the sale (or exchange with Sikorsky) of 600 to 800 legacy Black Hawks — mostly A and L models — making them available to foreign and domestic government agencies, as well as commercial operators. The Army planned to use the revenue and/or exchange credit to offset costs for replacement aircraft.

In the early days of the BEST program, operators could pick up a Black Hawk in flyable condition for \$500,000 or less. It would generally require a further investment of a million dollars (if not more) to get that aircraft ready to go to work.



Today, things have changed. "Nowadays, you don't buy a flying aircraft for less than a million dollars," Bart Brainerd, president of Firehawk Helicopters, told *Vertical.* "You're paying sometimes \$3.5 million for the HH-60Ls that have come out in the past six months — and that's before you do any reconditioning and upgrades. So, you're conservatively looking at putting another million dollars on top of what you spent for the aircraft."

To date, the BEST program has sold over 300 A and L model Black Hawks. As a result, the number of operators in the U.S. has grown significantly. By last count, there are more than 40 Black Hawks being operated by 28 operators in the U.S. Most of them are commercial operators, along with a handful of federal law enforcement agencies and fire agencies in California.

While the Black Hawk has more than proven its multi-mission capabilities for the military in battle, as far as the Federal Aviation Administration (FAA) is concerned, it's a restricted category aircraft in the commercial world. As a result, its mission scope is somewhat narrow.

"When the Black Hawk entered the civil utility market, it ended up in a role with very limited capabilities," said Travis Storro, chief operating officer at Timberline Helicopters and chairman of Helicopter Association International's restricted and experimental aircraft committee. "If you look at any of the TCs [type certificates], the Black Hawk only has three special purposes listed in restricted category: agriculture aircraft operations; forest and wildlife conservation, limited to the aerial dispensing of firefighting materials; and external load operations. And without a fire tank installed — and nobody currently has a certificated fire tank the only thing you can use the aircraft for is flying things attached to the cargo hook. That's the only thing the FAA will allow you to do in restricted category."

Regardless of the limitations as a restricted category aircraft, interest in the commercial Black Hawk is soaring. As a result, operators, engineering firms and parts manufacturers are developing products and systems to enhance the aircraft.



The Firehawk's sizeable cabin allows L.A. County to transport a 13-man crew. The organization can transition the aircraft from an EMS to a crew haul role in under four minutes.

Simplex Aerospace is developing two internal tanks for the Black Hawk — an 850-US gallon (3,220-liter) and a 1,000-US gallon (3,785-liter) model. **Simplex Photo** 



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#### TANK PROGRAMS IN PROGRESS

Presently, there are at least seven companies working to develop and certify firefighting tank systems. While many of these companies have been forthcoming about their plans, others are understandably reluctant to discuss the state of their own projects.

Firehawk Helicopters is in the final stages of developing a 925-US gallon (3,500-liter) internal tank, and hopes to have received a supplemental type certificate (STC) for it by the second quarter of 2019. The company is developing a number of other Black Hawk STCs, including a bubble window for external load operations certified to a maximum speed of 175 knots.

#### THERE MAY BE A LITTLE MARKET FOR THE EXTERNAL TANKS, BUT WE SEE A BIGGER MARKET FOR THE INTERNAL — MINIMUM MODIFICATIONS, QUICK ON AND OFF, LOWER ACQUISITION COSTS." - LARRY LICHTENBERGER, EXECUTIVE VP OF SIMPLEX AEROSPACE

Timberline Helicopters, which expects to have five of its seven Black Hawks working by next summer, is another operator developing a firefighting tank. "Our system is going to be vastly different than any other concepts that I've seen from other companies," said Storro. "We're looking at it through a very mission-specific lens. We want to do minimum modifications to the aircraft and we want to maximize its usability. So, we don't want to put a tank on the aircraft and then turn it into a tanked aircraft for the rest of its life. We have to be able to remove it and utilize it for external load operations because under the TC that's all we can use it for."

The operator is also in the final stages of gaining parts manufacturer approval (PMA) for purged fuel collectors to capture discharged fuel upon aircraft shutdown. "It's something the Forest Service wants us to have and it's something all our California customers are thrilled about," said Storro. "We've already equipped our own fleet."

In addition to two models of external belly tanks for the Black Hawk, Simplex Aerospace is working on two internal tanks an 850-US gallon (3,220-liter) and a 1,000-US gallon (3,785liter) model. Both have composite construction and can utilize a traditional suspended hover pump or a retractable hover pump. Each model installs into the rear cabin in 15 minutes using a rail system. The 850-US gallon model utilizes the existing hookwell in the aircraft's belly to deliver its load in five to six seconds. The 1,000-US gallon model requires modification to the aircraft's belly, with two additional holes enabling the tank to empty in two to three seconds.

While Simplex is developing both internal and external tank solutions, Larry Lichtenberger, the company's executive VP, believes the costly landing gear modifications required for the belly tank will put it out of reach for most operators. "We just think the internal tank is the way to do it," he told *Vertical*. "Think of the guy that goes out and gets a Forest Service contract, and maybe he pays \$300,000 for an aircraft, and maybe a million or more getting it ready to fly; he doesn't want to spend [another] \$2 million to get a tank on it. There may be a little market for the external tanks, but we see a bigger market for the internal — minimum modifications, quick on and off, lower acquisition costs."

The Garmin G5000H touchscreen flight management system and vehicle management system is the basis for several cockpit upgrades for the Black Hawk. Garmin Photo



#### **BUILDING THE NEXT GENERATION**

United Rotorcraft and Kawak Aviation Technologies have teamed up in their pursuit of the next generation firefighting tank system. United Rotorcraft is currently performing its Firehawk conversion on 10 Black Hawks destined for four California fire agencies: Cal Fire, Ventura County, Los Angeles County and San Diego City (spanning eight new S-70i and two HH-60L models). Cal Fire has committed to seven additional S-70i aircraft within the next three years. Kawak is charged with designing and manufacturing the tank.

The United Rotorcraft/Kawak tank is similar to the belly tank system flown aboard the S-70s belonging to Los Angeles County Fire Department (LACoFD), but will offer several improvements. "We are doing a 100-percent brand new 1,000-US gallon metal firefighting tank with a new modular hydraulic system powering the refill pump and the doors, which will be set up very much like the old system," said Kawak's Andrew Sawyer. "There are lots of things about the old system that we're keeping, but we're using current technology in the new design."

Because government operators such as firefighting agencies fly as "public use" aircraft, their mission scope is not limited to "restricted category" operations. As a result, completion houses like United Rotorcraft are developing products and interiors to meet the multi-mission public service role. "It's an exciting time," said Mike Slattery, United Rotorcraft's president. "We're seeing the interest in Firehawks just take off, and a lot of it is the ability of the aircraft to do the multi-mission [role]. And when it's a government agency and they don't have the restriction relative to carrying fire crews . . . that really leverages the true capability of the Firehawk."

It was LACoFD that first introduced the Firehawk into the parapublic arena in 2000. The agency, along with its industry partners, is proud to claim ownership for the aircraft's firefighting systems and mission innovations.

"We pioneered the first retractable snorkel for the drop tank," said Lee Benson, who spent 26 years with LACoFD. "To this day, the LACoFD Firehawks are the highest-performance truly multi-mission helicopters in the world: water dropping 1,000-US gallons, a 13-man crew haul, high speed hoist, full EMS [emergency medical service] medical equipment, and the ability to transition from EMS to crew haul in under four minutes. I know I'm bragging a bit, but as the project manager, I take a lot of pride in what our folks, Sikorsky, Air Methods and Aero Union — who built the tank — were able to accomplish."

United Aeronautical Corporation has many years of experience in developing modular airborne firefighting systems for large fixedwing tankers. In discussing potential projects related to the Black Hawk, Bradford Beck, the company's president and COO, said only: "We have not filed any STCs yet, but there are various vertical-lift systems in consideration now on various different platforms — and [the] Black Hawk and S-70 are definitely involved in those."

#### **ADVANCED AVIONICS**

Other innovations for Black Hawks are coming in the form of advanced cockpit avionics suites. Ace Aeronautics purchased two aircraft from the BEST program to aid their development of the Ace Deck VL-60, which uses Garmin's G5000H touchscreen flight management system and vehicle management system. The company is also developing an EO/IR sensor mount. Ace Aero's Tracy Stapleton said the company expects the Ace Deck to receive an STC by March 2019.

Rogerson Kratos is pursuing a similar advanced cockpit solution with sophisticated integration for firefighting. The company has teamed up with a tank manufacturer to develop technology for better load management and targeting.

"We're looking at how do we assist the firefighter in determining how to lay down the perfect layer of fire retardant," said Mike Miller, VP of military programs at Rogerson Kratos. "You have GPS and you

Firehawk is developing a number of supplemental type certificates for the Black Hawk, including a 925-US gallon (3,500-liter) internal tank and a bubble window for external load operations. **Skip Robinson Photo** 

have a mission plan, and then how do you put that information into a system that can steer the pilot and determine when to make the drop and the ideal coverage?"

#### "YOU WON'T NECESSARILY HAVE THAT OVERARCHING UMBRELLA OF NORMAL CATEGORY CERTIFICATION, BUT I THINK YOU'LL SEE EXEMPTIONS AND CERTIFICATIONS TO ALLOW THE AIRCRAFT TO PERFORM MISSIONS THAT ARE VIEWED AS BENEFITTING THE PUBLIC GOOD." – BART BRAINERD, PRESIDENT OF FIREHAWK HELICOPTERS

Elsewhere, Honeywell Aerospace has received an STC to install its Aspire 200 satellite communications system aboard Black Hawks. Developed specifically for helicopters, the system provides real-time data, voice and video transmissions, acting like a Wi-Fi router providing high-bandwidth connectivity with "smart" devices throughout the aircraft.





Beyond firefighting systems and advanced avionics, companies are pursuing development of other mission enhancing products. Aerometals (formerly FDC/Aerofilter), is finalizing approvals for what the company describes as a "next generation" inlet barrier filter (IBF) system for the Black Hawk. It is also producing a lightweight straight exhaust that provides an estimated 400-pound weight saving over the legacy Hover Infrared Suppression System module assemblies.

Because Donaldson Filtration Systems originally developed the IBF for the U.S. Army, a number of aircraft being acquired from the BEST program have that company's kits already installed. When asked about the commercial Black Hawk, global sales director Lars Hesbjerg said, "Right now, we have not seen any inquiries from the commercial side, but we have had some interest when operators procure those aircraft already equipped with the kits and are looking to retrofit them for commercial use."

With external lifting such an essential mission for the commercial operator, cargo hook manufacturers On Board Systems and Mechanical Specialties LLC have both developed replacement cargo hooks for Black Hawks. Each are rated to 9,000 pounds, have load cell integration, and improved secondary release systems over the legacy hooks they replace.

Meeker Aviation has five searchlight and camera/sensor system mounts for the Black Hawk, but they are not expected to be of particular interest to civil operators. "My interest in the commercial side is very, very small," said Cal Meeker, the company's president. "I just don't see a lot of business, because those operators just aren't doing that. We don't do a whole lot of business in the commercial market now. Instead, I want to be in position to offer the military H-60 operators around the world a chance to put on sensor packages that otherwise might be too cost prohibitive."



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The Black Hawk may always be a niche player in commercial operations. But going forward, many believe it will find a home in other markets such as mining, military training, and perhaps even commercial search-and-rescue (SAR).

"You're never going to have it as a standard category [aircraft]," said Brainerd. "But I think what you're going to see is special purpose certifications. That's essentially what PJ Helicopters is doing with the Bureau of Land Management, (BLM). The BLM had to do a public aircraft declaration so PJ can carry firefighters. So they've wedged that aircraft now into a special purpose contract and a special purpose certification and they're doing something with the aircraft that has never been done before. "I believe that's the 'opening shot,' if you will, of what's going to become a very diverse market. So you won't necessarily have that overarching umbrella of normal category certification, but I think you'll see exemptions and certifications to allow the aircraft to perform missions that are viewed as benefitting the public good."



SUTLETY KANK

1804PJ

**Dan Megna |** Dan served nearly 20 years of a 30-year law enforcement career as a helicopter tactical officer, pilot, and flight instructor with a large Southern Californian sheriff's department. He has been a regular contributor to *Vertical* since 2004.

PJ Helicopters received a Restricted Category Type Certification for its PJH UH-60A Utility Hawk in July 2015. **Evan Welch Photo** 

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A lineman completes a transfer onto a tower from a Slave Lake Helicopters Airbus H125. The company uses its custom-designed AStep to perform these operations.

ANNER



George Kelham is a precise man. Given that he has spent almost 40 years working in the helicopter industry, many of which have been at one end of a long line, perhaps that's not too surprising. But this precision is also reflected in his ability to pluck exacting details about his career from the top of his head without a moment's hesitation.

His first job in the industry — for Calgary-based Kenting Helicopters — began on Jan. 1, 1981; he first arrived in Slave Lake, Alberta — the town that would become his home for the rest of his career — on Sept. 1, 1983; and when he and his wife, Debbie, established their company, Slave Lake Helicopters, they received their operating certificate from Transport Canada on Jan. 26, 1998. "The reason I know that one is because it happens to be Wayne Gretzky's birthday, and I'm a big hockey fan!" he told *Vertical*.

Born and raised in Rhodesia, Kelham decided he wanted to fly helicopters after he took his first helicopter ride at 17 years old in July 1972. He moved to Canada five years later to begin his flight training, gaining his license in 1980. "By the time I was hired by Kenting Helicopters in 1981, I had received my Journeyman powerline ticket, and have been flying helicopters for the last 38 years," said Kelham. "I've been very lucky."

He and Debbie started Slave Lake Helicopters with one leased Bell 206L-1 LongRanger, and found they greatly enjoyed the challenges and opportunities that being company owners presented. Slave Lake Helicopters proved an immediate success, keeping busy throughout

its first season. "The biggest regret I have is that I should have started my own business sooner," said George Kelham. The first season was such a success that they were able to buy the company's first helicopter - a used Airbus AS350 BA - the following year.

Today, Slave Lake Helicopters has a fleet of seven owned aircraft, including two Airbus H125s, three AS350 B2s, one H120, and one Bell 206 Jet Ranger. The company operates from two modern hangars at its facility at Slave Lake airport, on the edge of the small town of Slave Lake.

The settlement lies in the geographic center of the province of Alberta, about 125 miles (200 kilometers) northwest of Edmonton, and 125 miles (200 kilometers) southwest of Fort McMurray. Serving as the hub for many smaller communities in the region, Slave Lake sits on the southeast shore of Lesser Slave Lake, which spans 450-square-miles (1,160-square-kilometers), and is surrounded by forests, rivers and smaller lakes.

In this environment, Slave Lake Helicopters has developed a specialization in forestry-related work — planting trees and fighting forest fires — as well as powerline patrol and powerline maintenance.

Tree planting was one of the main sources of work in the company's first year of operation, and remains so to this day. Slave Lake Helicopters has about five mills providing them with this work, which entails flying boxes of young coniferous trees — typically pine or spruce — to locations that are otherwise inaccessible in the summer. "In the wintertime, the mills will build these winter access roads to harvest and haul the trees out," explained Kelham. "And then in the summertime, they're obligated to reforest those areas that they've cut. Of course, now they can't get in there because their frozen roads are mush, so they need helicopters."

Over the course of the last 21 years, Kelham estimates Slave Lake Helicopters has helped plant about 125 million trees, at a current rate of about eight to 10 million trees per year.

"I've made some very, very good relationships with the mills," he said. "I've been planting trees for some of those mills for 25 years."

The AS350 B2 is the aircraft the mills typically request, due to its lower cost than the H125, said Kelham. "The most economical heli-copter for tree planting is a B2," he said. "It'll lift about 11,000 seed-lings at a time — 12,000 on a good day — and it'll move five people."

#### LAUNCHING NEW PROGRAMS

Other longstanding operations for Slave Lake Helicopters include fighting wildfires, powerline construction, oil-and-gas support, and wildlife management. But the company has also shown a desire to evolve, instigating two new specialist programs — one of which is unique within Canada. Both have been developed and led by project manager Andrea Pelletier.

The first was the "AStep" program, in which a custom-designed platform installed on the starboard side of an AStar is used to transfer linemen to powerline towers for maintenance operations.

Typically, one aircraft works with six linemen, transporting two at a time from the staging area to the structure, and then moving them two at a time throughout the day.

Following a patrol of the line to identify any hazards, the team begins the transfer process. "When we're ready to transfer a lineman, the approach is the first step in the operation," said Pelletier. "We have certain standard calls we use. During the approach, the lineman will get up from the cabin and he will step on the platform, and he will do certain maneuvers to get ready to bond onto the structure.

"When we're on the final approach, we still use standard calls — 'OK?' — and then he bonds on. The lineman inside will give him his tools, and the lineman on the platform will put the tools on the wires."

The entire finely-tuned procedure is scripted in detail to ensure it follows an exact pattern.

The program required a large investment from Slave Lake Helicopters to develop and implement (the company owns the supplemental type certificate for the step), but the oil-and-gas market took a nosedive just as the company began operations with the AStep. This has restricted its use to around 50 hours a year, but Kelham hopes to grow this to around 250 hours a year once the oiland-gas sector has recovered.

The second program is a pilot project to explore the use of human external cargo (HEC) operations during wildfire fighting operations. The program, which has only just completed its first season, is a two-year pilot project being conducted in collaboration with Alberta Agriculture and Forestry.

According to the provincial department, the project will test the HEC system "for its effectiveness of deploying and extracting firefighters on wildfires."

Essentially, the operation sees firefighters transported to wildfires on a long line.

"The pilot will land, hook up the firefighters to the long line, and insert them into the fire," said Kelham. "The pilot will then go back to the staging area, remove the HEC line, put the long line on with the bucket, go back, and feed these guys water and try to hold the fire. George Kelham, the co-owner and president of Slave Lake Helicopters, said the company has likely helped plant 125 million trees over the last 21 years. **Mike Reyno Photo** 



Slave Lake Helicopters uses a hook from Boost Systems for its human external cargo (HEC) operation.



For the HEC pilot project, Slave Lake Helicopters flew four wildland firefighters at a time at the end of a ong line. Alberta Agriculture and Forestry Photo





Firefighters and Slave Lake Helicopters staff pose for a photo in front of one of the operator's H125s during the first season of the HEC pilot project. Alberta Agriculture and Forestry Photo



The H125's reserve power is one of the main reasons the aircraft has been chosen for the AStep program.

"At the end of the day, he'll put his HEC line back on with the steel plate, go back into the fire, and extract the firefighters back to the staging area. They'll roll up all the buckets and long lines and harnesses, get in the helicopter, and go home."

Without the HEC system, the firefighters have to walk to the fire from a staging area (which could be over a mile), or build a landing pad near to the fire (which can take several hours).

Slave Lake Forest Area Firefighter Coordinator Mike Turcotte said he first tried the system in July 2017, and as soon as he was airborne he realized it could be very beneficial to wildfire operations in Alberta.

Slave Lake Helicopters uses an Airbus H125 for the work — and Kelham said it was the only type the company would consider using for it.

"There are a lot of reasons for that," he said. "One is the dual hydraulics; two, the reserve power is immense. The maximum allowable, on the HEC line with humans, is 1,150 pounds [520 kilograms]. At 1,150 pounds, that engine's just at idle — so it has a lot of reserve power for safety."



and-daughter team in the industry. Marianne recently joined Slave Lake Helicopters as an aircraft maintenance engineer.



#### carefully scripted to ensure the operation is as safe as possible.

#### **HEC IN OPERATION**

As with the AStep program, Pelletier serves as the project manager of the HEC trial at Slave Lake Helicopters. She had been exploring the possibility of using HEC to sling firefighters to wildfires for several years before Alberta Agriculture and Forestry decided to launch a pilot project, awarding the contract to Slave Lake Helicopters.

Before completing crew resource management training with the two crews of firefighters assigned to the program, all pilots had to complete a test on HEC operations that is used throughout North America.

"It's a precision test that is time-limited," said Pelletier. "We had to do three circuits around obstacles, and we had to do that in six-tonine minutes."

Slave Lake had three pilots qualified to perform the HEC operations last summer, providing ample backup to each other for the one machine dedicated to the work.

The teams used three lengths of long line - 100 feet, 150 feet, and

200 feet - and the operation would follow a set routine. First the firefighters' bags of equipment would be flown from the staging area to the fire, then the firefighters themselves - four at a time - along with more bags on the line underneath them.

"The bag will touch down first - that kind of stabilizes the load," said Pelletier. "Then, slowly, the guys will touch down. They catch the bag and they unhook their harness."

After many weeks of practice, the team performed their first HEC insertion on a fire in May 2018.

"My first flight on the long line was very thrilling," said first-year firefighter Cody Tomasttewski. "I was a little nervous, however, the extensive training prepared me for what to expect."

Pelletier agreed that the extended training time made it an easy transition to active operations.

"The biggest challenge was to manage the excitement!" she said. "It was very, very smooth. I think that the key to the success was all the training we did together."

Over the first summer of HEC firefighting operations, one of Slave Lake's pilots alone performed 262 HEC cycles (insertion and extraction) — a huge volume of work for this type of operation.

Kelham said his company was the only one he knew of in Canada that is approved for HEC work for firefighting - but that it is restricted to that specific operation.

"Right now we are Transport Canada-approved for insertion and extraction with a single engine [helicopter] on emergency use only," said Kelham.

Pelletier said she was pleased with how the first year of the pilot program had gone. "This year was a success, and now Alberta Agriculture and Forestry are evaluating," she said. The program will continue next summer.



Marianne Pelletier takes a look under the cowling of an H125.



#### **DUAL HANGARS**

The fleet is largely rested over the winter, with only operations for established customers continuing over the coldest months of the year. "[Winter operations] are hard on the helicopters," said Kelham.

Depending on the year, Slave Lake Helicopters can fly anywhere from 2,200 hours to 2,800 hours across its fleet. "My target is 3000 fleet hours with seven helicopters. If I could get 3,000 fleet hours, I'd be very happy," said Kelham.

The company worked from a single hangar until this year, when its fleet had expanded to such a point that it needed a secondary space to fit them all. It purchased land directly east of its existing building to create a slightly larger hangar. The original hangar is now dedicated to maintenance work and administration, while the newer hangar is the base for operations.

The maintenance hangar gives all the engineers their own workstation, with a desk, chair and computer; while the operations hangar contains a pilot ready room, a classroom, and a reception area for customers.

The company's engineers provide non-specialized maintenance — any specialized work is sent out — but that still allows them to perform about 90 percent of the work they need to do in-house, said Jeff Nagy, Slave Lake Helicopters' director of maintenance.

"The environment in Slave Lake is not too bad for the machines," he said. "There's some sand, which is hard on blades, but it's not as bad as Fort McMurray. We don't have to deal with rain like they do on the coast, so that's nice. But it's pretty tough to beat an AStar for doing utility work, from a maintenance standpoint. It's the easiest one to keep running."

The company has a full-time staff of 10, with four more pilots and one engineer hired during the peak summer months.

Leroy Dean was the first pilot Kelham hired, back in 2004. The two have known each other for more than 35 years. An industry veteran, Dean has now recorded around 21,000 flight hours over his career.

"It's been good to me, Slave Lake Helicopters — they've got nice equipment and they've treated me well," he said. "I've got nothing but good things to say about the company. It's a good place to fly helicopters."

Pelletier is another experienced employee, having been with the company 10 years — spread either side of a period working at Transport Canada.

"It was the friendship that brought me back to them," said Pelletier.







"[The Kelhams] have always been not only good to me, but fair and honest. George says it's a mom-and-pop operation, but I don't like this expression, because it's such a professional operation. It's a family-run business, and they run it to a really high standard."

Kelham believes the biggest challenge of having an operation in Slave Lake is finding and attracting the right staff to do the right job. He understands that a small town in rural Alberta might not hold the appeal of other locations to some people, but hopes that treating his staff well, providing good facilities and equipment, and providing good work helps to compensate. And it's an approach that appears to have worked, given the longevity and loyalty of many of Slave Lake Helicopters' staff.

For her part, Pelletier says the opportunity to work on such interesting programs has also proved appealing.

"We hoped the two programs would attract more specialized, qualified and passionate people, and they did. It worked," she said. In terms of future growth, Kelham is open to the idea of acquiring

something like a Bell 212, "if I see an opportunity that would allow us to bring in a medium," he said. "At the end of the day, you've got to be able to pay for it."

For now, he's happy with the direction of the company and proud of what he and Debbie have created. "We've obviously done something right," he said. "We've built a very nice company." And with the next generation of Kelham joining the company this last summer — the couple's son, Taylor, now works as logistics and operations coordinator — the Kelham name looks set to play a significant role in this part of the rotary-wing world for a long time to come.



Oliver Johnson | Editor-in-Chief of Vertical Magazine, Oliver has been covering the helicopter industry since joining MHM Publishing in 2012. He can be reached at at oliver@mhmpub.com Follow him on Twitter @orjohnson\_

Slave Lake Helicopters has seven aircraft in its fleet: two Airbus H125s, three AS350 B2s, one H120, and one Bell 206 Jet Ranger. Mike Reyno Photo

The AStar is the aircraft of choice for both the AStep and HEC program.





# Powered

The Bell 407GXi — the latest evolution of the Bell's hugely popular light single — features the Garmin G1000H NXi avionics system. *Vertical* got behind the controls to see how the aircraft shapes up.

#### BY GUY R. MAHER

Most helicopter types that endure the test of time go through a process of gradual evolution. Once the airframe itself has been physically dialed in as much as possible, further developments are typically dependent on advancements in technology. Such is the case with the Bell 407GXi.

From the time I first flew the Bell 407 certification flight test vehicle over 22 years ago, this "get the job done" helicopter has seen a number of physical improvements to the basic ship. These include increased shaft horsepower for operations in higher and hotter conditions, as well as numerous kits and options to expand the 407's range of operations and utility.

Then technology took over. The 407GX, launched in 2011, offered the Garmin G1000H avionics suite. Introduced first as an option, the G1000H panel eventually became the only suite offered with a factory-built 407. Subsequent to the launch of the 407GX was the 407GXP, which utilizes the latest variant of the Rolls-Royce M250 engine.

The 407GXi shares the GXP's powerplant, but the newer variant now comes with a dual channel full authority digital engine control (FADEC) fuel management system. More on this later.

The Garmin G1000H NXi Integrated Flight Deck avionics system is the command center of the Bell 407GXi. The 407GXi's standard configuration includes the synthetic vision system (SVS), and initial installation of the helicopter terrain awareness and warning system (HTAWS) and navigation database. The system has two SD card slots to facilitate data input/output tasks, such as flight plan and database uploading or critical flight data downloads. The Garmin G1000H NXi system includes two 10.4-inch GDU

1050H high definition LCD displays (interchangeable primary/ multifunction flight displays); dual communications, navigation and GPS; a wide area augmentation system (WAAS), and a mode S transponder with extended squitter. As such, the standard-equipped 407GXi is compliant with the Federal Aviation Administration's (FAA's) 2020 ADS-B "Out" mandate.

User-selectable options on the multifunction flight display (MFD) in the standard configuration G1000H NXi include system status, checklists, flight planning, maintenance pages, engine pages, power assurance screen, navigation map, traffic information system (TIS), engine and transmission information, fuel status, and calculated range.

Optional features include satellite weather through an XM satellite datalink, a voice/data transceiver, tail rotor camera display, and the Garmin GTS 800 traffic advisory system. Also available as an option is the Garmin Flight Stream 510, which enables the wireless transfer of aviation databases from the Garmin Pilot app on a mobile device to the G1000 NXi system.

The Flight Stream 510 also supports two-way flight plan transfer, and the sharing of traffic, weather, GPS information, back-up attitude information and more, between the G1000 NXi and compatible mobile devices running Garmin Pilot or ForeFlight mobile.

I have flown with the Flight Stream 510 and it spoils you. My favorite

feature is the ability to pre-load flight plans on the tablet and then push them to the panel for the flight. Once enroute, deviations are as simple as "rubber-banding" the course line on the tablet and then sending the change to the panel.

My opportunity to experience the 407GXi was offered this past summer, with senior Bell demonstration pilot Will Williamson. The two of us briefed for our flight in the building adjacent to the Bell Training Academy (BTA) helicopter parking area. Following a walk-around of the aircraft, we boarded for our flight. As the FAA had yet to validate Transport Canada's type certification of the aircraft at the time of my flight, we used a Canadian-registered 407 GXi.

The MFD splash screen at startup is slightly different from prior configurations of the G1000H. Previously, the first screen presented would be weight and balance. Now it calls for exceedances first. Our screen was clean, so we advanced to the weight and balance page.

What's changed here is that you see a whole chart with the center of gravity point plotted — allowing you to see longitudinal and lateral c.g. all at once. It also plots the path of c.g. changes as fuel is burned. So, you can see where you are at the start of the flight and where'll you'll be at the end.

There is also a Hover Performance page that presents the pilot with real-time or pre-flight planning power required to perform out of ground effect (OGE) or in ground effect (IGE) hover operations



1 // The 407GXi's G1000H incorporates a hover performance page that presents the pilot with real-time or pre-flight planning power required to perform out of ground effect (OGE) or in ground effect (IGE) hover operations when outside air temperature (OAT) and altitude are in the certified envelope. 2 // One of the more significant changes to the G1000 NXi that is incorporated in the 407GXi is the inclusion of charts — both visual flight rules (VFR) and instrument flight rules (IFR). 3 // The 407GXi weight and balance screen has changed — allowing you to see the plotted longitudinal and lateral center of gravity (c.g.) all at once. It also plots the path of c.g. changes as fuel is burned. 4 // The 407GXi lower panel is a little cleaner now compared to all earlier variants, since the FADEC is dual channel. As such, you don't have the overspeed test, horn test or "manual/auto" button. 5 // The two-axis autopilot in the 407GXi was well commanded through the PFD. Bell is working on a third axis for the pedals. And the prospects are bright for an IFR-certified 407GXi in the not-too-distant future. 6 // The Garmin G1000H NXi Integrated Flight Deck avionics system is the command center of the Bell 407GXi. The 407GXi's standard configuration includes the synthetic vision system, and initial installation of the helicopter terrain awareness and warning system and navigation database.



when outside air temperature (OAT) and altitude are in the certified envelope. The page consists of a hover power indicator (HPI) and the hover performance display section.

The HPI displays the power required to hover OGE or IGE at the current aircraft weight, OAT, pressure altitude, and wind condition. The power situation indicator will display the predicted power required to hover OGE or IGE at the pilot's entered destination, aircraft weight, OAT, pressure altitude, and wind condition. This certainly improves risk management with hot/high operations by letting pilots know what they need ahead of time.





The engine page on the MFD hasn't changed, and we called it up in preparation for the engine start, which is smooth and easy due to the FADEC. Next, we performed a quick autopilot check and were ready to go.

The 407GXi panel is a little cleaner now, since the FADEC is dual channel. As such, you don't have the overspeed test, horn test or "manual/auto" button. Additionally, you can now wrap the throttle full on to the "fly" position. The FADEC will not allow the torque to go any higher than 40 percent as the blades spin up. Our spin up to 100 percent rotor speed was very smooth.



Bell 407GXi

The pick up to a hover and transition out of the BTA helipad reminded me of how much power the 407 has. We were quickly on our way to nearby Lake Arlington for some air work. I set up a gentle climb at 75 percent torgue and 110 knots.

Williamson took me through some of the G1000 NXi's changes, with one of the big ones being charts, including visual flight rules (VFR) and instrument flight rules (IFR). He pulled up a full screen MFD display of the Dallas area Class B chart. Traffic and weather will overlay on the new maps, as well, which is a nicely integrated feature. Finally, the G1000H has caught up with the fixed-wing version!

Mechanically, nothing has changed with the 407GXi in regards to the flying aspects of the helicopter. Therefore, although I enjoyed flying around for a little bit just because I love the 407, it really wasn't necessary.

I did play with both the synthetic vision and the highway in the sky features on the PFD and they were identical to the prior GX variants, with one small exception. To me, the overall display looked cleaner and crisper, and a little easier to read. When I observed this, Williamson said that Garmin did clean up the color edging and display a little bit. And it showed.

New to the 407GXi MFD is WireAware. At our altitude, some wire locations popped up as white dashed lines. Not all wires are marked — their locations are just starting to populate the database and will continually expand over time. And like other hazard

-DXIC

warnings on the G1000H NXi, as you descend, the wire plots will go from white to yellow, and eventually red. This will be really nice once the level of coverage for wire locations equals that of obstacles already in the database.

I played with the autopilot for a few minutes — commanding it through the PFD — and as expected, it flew the 407 like it was on rails. Williamson said they are working on a third axis for the pedals. When I mentioned that the 407 needs to be an IFR machine, Williamson said Bell was "close" to achieving it. "We've already flown the FAA guys and they want to come and do one more set of trials — like hydraulic failures on approach," he said. "I haven't heard of any major issues."

With our playing finished over the lake, we headed to the BTA practice area (PA). Just to get the feel back, I performed a normal approach to a hover to lane 1 at the PA. These 407s are so smooth you hardly feel like you're flying. With that maneuver completed, it was time for autorotations.

While turning in the PA traffic pattern, another helicopter in the PA popped up on the PFD screen and the audio alert stated, "Traffic ten o'clock, high, zero miles." The female voice used on the alert was much more toned down and subtle than the previous G1000H's voice, which I recall as being loud and obnoxious. Normally, the main event when working with Bell pilots in the PA is the full touchdown autorotation. The BTA is legendary for this and I always look forward to doing them when at Bell. But not this time.

Since the introduction of the Bell 407 over 22 years ago, physical improvements to the model have included increased shaft horsepower for operations in higher and hotter conditions, as well as numerous kits and options to expand the 407's range of operations and utility. Now, technology is taking the lead in the 407's evolution. **Peter Handley Photo** 





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Because with the 407GXi, the real story is actually about autorotations to a power recovery.

Rolling the throttle off automatically moved the MFD from the chart page to the engine page. Nothing was different during the glide portion of the auto; it was the recovery where things changed. Once into the initial flare, the throttle is rolled right to the full "fly" position. The dual channel FADEC smoothly brought the power in, matching the needles right where you need them to be.

You don't have that twist grip versus pedal dance. The transition to power is super smooth. This is going to make offsite autorotation training and practice in customer ships much nicer, safer and with far less potential for exceedances or loss of control.

And, as Williamson pointed out, this is also a great feature for new instructor pilots (IPs). "That's where we usually get bit is with new IPs conducting autorotation training," said Williamson. "They get to the bottom, whip that throttle in, forget to put that pedal in, and that's it." I can say that these power recovery autos in the 407GXi were the smoothest, easiest, and most worry-free I have experienced.

With the autos out of the way, it was back to the BTA parking area. Once on the ground at our assigned pad, the throttle went to idle to start the two-minute cooldown. It's still up to the pilot to keep the time, unlike the 505 for example, that tells you after 30 seconds that it's ok to shut down. Somehow, I think 407GXi pilots will suffer through having to watch a timer without complaining too much.

The new 407GXi brings some palpable improvements to the well-proven type. I often comment that in all of my years flying the line — and some very fine helicopters — I never had the chance to experience true line flying in the 407. Having only had the opportunity for sporadic flying in the 407 over the past 22 years has been a bit disappointing. After flying the 407GXi, that disappointment level is certainly elevated. Those who have the chance to fly it regularly have a real gem in their hands.



**Guy R. Maher |** Guy has recorded than 17,000 flight hours as a dual-rated pilot and flight instructor with helicopter, airplane and instrument ratings. He runs Lanier Media Aviation Services, a company he founded in 1978. He can be contacted at guy@verticalmag.com.



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AGA uses an EC145 for most of its offshore missions. The aircraft has an offshore range of up to 100 nm, which allows for around 25 minutes of loiter time, plus fuel reserves.

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STORY BY ELAN HEAD | PHOTOS BY LLOYD HORGAN





Before it was optimistically rebranded as the Cape of Good Hope, South Africa's famous headland was known as the Cape of Storms. And "Cape of Storms" is still a fitting nickname for the region near Africa's southern tip, which is notorious for galeforce winds and rough seas. Maritime technology may have advanced significantly since Portuguese explorer Bartolomeu Dias first rounded the cape in 1488, but it's still no match for Mother Nature.

So ships still run into trouble here, and sometimes they run aground. When they do, the first priority is safely evacuating the crew. The next is protecting sensitive coastal environments from leaks of fuel and oil, often necessitating complex salvage operations that can last for days or weeks. In such cases, helicopter support can be critical: for ferrying crewmembers off the ship and salvage experts onto it, and transporting the towing chains and other equipment needed to remove the wreck.

For these services, salvors like the Dutch company SMIT Salvage often turn to Aerios Global Aviation (AGA). Based in Cape Town, South Africa, about 30 miles (50 kilometers) north of the Cape of Good Hope, AGA has built a business catering to maritime traffic transiting those often stormy waters. Many of the operations it conducts are routine transfers of cargo and personnel. But with its hoist-equipped Airbus EC145, AGA also stands ready to provide rescue and medevac services offshore, and to support the salvage of vessels that have no good hope left.

Moreover, the company does much of this in the same rough weather that can be so tough on its customers. As AGA chief pilot Stephen Merry explained, "In the wintertime, we're continuously battered by cold fronts, and that's usually when the vessels will run into trouble, or start running aground. So 90 percent of the flying we do is in the bad weather — swells up to 10, 12 meters, and the winds pumping up to 60 knots. That's probably our biggest challenge, flying out in those conditions."

#### **CARVING A NICHE**

AGA was founded in 2011 by CEO Malcolm Pitcher, an experienced flight engineer and maintenance engineer who has operated and managed aircraft in some of the harshest environments on the planet. Immediately prior to AGA, Pitcher was overseeing a fleet of 15 Mil Mi-8 helicopters in Afghanistan. With his new company, he envisioned putting this dependable Russian helicopter model to work under a Western operational framework, compliant with Western safety standards and best practices.

South Africa was an ideal location for the new venture, because the country already had some Mi-8s on its civil aircraft register.







AGA's EC145 conducts training with Cape Town's iconic Table Mountain in the background. Cape Town is blessed with tremendous natural beauty, but the weather here can be fierce and unpredictable. "The mountains combined with the very strong winds that we get here can cause havoc with the helicopters," said pilot Abri Le Roux.



With foreign partners, Pitcher started AGA with two Mi-8MTV1 helicopters in South Africa, which were subsequently deployed on humanitarian contracts throughout Africa. Closer to home, the Mi-8s also proved to be an ideal platform for ship salvage operations, thanks to their robust build and four-tonne (8,800-pound) lifting capacity.

"The Mi-8 lifts up to four tonnes of steel chain or equipment at a time, so it's a useful tool," Pitcher said. "It's a flying truck, really, [and] it does the job very, very well."

In August 2013, AGA deployed an Mi-8 in support of salvage operations for the Kiani Satu, a cargo vessel that ran hard aground at Buffels Bay, around 260 miles (420 kilometers) east of Cape Town. With several of the vessel's double bottom tanks breached, and bunker oil leaking into the ocean, SMIT was contracted to salvage the vessel in order to minimize the environmental damage.

SMIT crews managed to pump oil from the breached lower tanks into the upper tanks, and from there into portable tanks that were flown off the ship in multiple airlifts. Meanwhile, the salvage tug SMIT Amandla was eventually able to refloat the vessel and tow it more than 100 nautical miles offshore, where it sank in deep water. Just days later, AGA was called upon to support another SMIT Salvage job when the coal carrier MV Smart ran onto a sand bar and broke in half near Richards Bay, on South Africa's eastern coast.

While the Mi-8s were earning their keep, AGA was also expanding into Western aircraft models with the addition of two Airbus



AS365 N2 Dauphin helicopters. Although available to the general maritime industry, these were targeted specifically toward the offshore oil-and-gas industry, including oil and gas tankers making their way past Cape Town. From the beginning, AGA set its sights on compliance with International Association of Oil and Gas Producers (OGP) report 390 standards (recently revised as report 590), and the company has now been audited and approved by a number of oil-and-gas customers.

#### "THERE'S NEVER A THING WHERE, 'IT'S NOT MY JOB,' OR 'THAT'S NOT SOMETHING THAT I'M MEANT TO DO, IT'S NOT IN MY JOB SPEC.' EVERYBODY KIND OF PULLS TOGETHER AND WE'RE ALL WORKING IN THE SAME DIRECTION." – AGA CHIEF PILOT STEPHEN MERRY

In 2016, Pitcher's foreign partners withdrew from the company, taking with them the Mi-8s and, eventually, the Dauphins. To replace them, AGA acquired an EC145 that according to Pitcher is "the perfect utility helicopter." Certified for operation under instrument flight rules (IFR) and equipped with a Goodrich hoist, the twin-engine, Category A EC145 is capable of the most demanding offshore missions, including rescues. But its large, open cabin can be quickly reconfigured for helicopter emergency medical services (HEMS) and VIP transport, which has allowed AGA to expand into new markets onshore, too.

"We decided to be a very diverse operation using utility helicopters," Pitcher explained. Having an aircraft as versatile as the EC145 has "allowed us to use it for a number

of diverse projects in the industry," he said.

From a pilot's perspective, "the 145 is a great platform, especially for HEMS and anything hoisting-related," said Merry, who traveled to Metro Aviation's Helicopter Flight Training Center in Shreveport, Louisiana, for training on the model. "The reliability is great. It makes our life up front very easy, it's got all the good avionics, autopilot for the IFR and night stuff that we do."

The EC145's spacious cabin also makes life easier for the rear crew. Hoist operator and maintenance engineer Shane Beeton described the 145 as the "gold standard" for a rescue helicopter. "It's a very stable platform," he said. "The smaller rotor disc and the very powerful hoist, large cabin doors and the large cabin allow it to be very







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for missions that do not require twin engines, IFR, or hoist capability. **PULLING TOGETHER** According to Pitcher, everything AGA does is guided by the company motto of "Quality, Safety, and Integrity." "I come from an airline background and we always operate to the high standards of an airline. It's always been a belief of mine that you give quality, safety, and integrity, because that way you're giving good customer service, you're giving a very

safe operation all the time," he said. AGA conducts a formal risk assessment before every flight. Moreover, Pitcher said, he teaches his employees to embrace audits as a validation of their high achievement and an opportunity for further improvement. "You should be doing your job; if you're doing it correctly you operate to those high standards at all times," he said. "So we welcome being audited by the oil-and-gas industry, by any of the particular clients, or by the CAA [Civil Aviation Authority]."

versatile both for offshore operations as well as rescue oper-

Augmenting the EC145 is another proven utility helicopter, a Bell 206L4 LongRanger that is a cost-effective alternative

ations, or just general moving of people around."

#### AGA is headquartered at the Cape Town Airport, but has operated all over South Africa and beyond.

AGA has removable medical interiors for both the EC145 and LongRanger. To expand its HEMS operations, AGA has partnered with Airborne 24, which contributes paramedics and medical licensing.







Despite this emphasis on high standards, the small team at AGA has a relaxed camaraderie. According to pilot Abri Le Roux, "We strike a nice balance where it is very professional and we have all our affairs in order, but at the same time we're all friends and we get along nicely."

"We all work together as a unit," Merry echoed. "There's never a thing where, 'It's not my job,' or 'That's not something that I'm meant to do, it's not in my job spec.' Everybody kind of pulls together and we're all working in the same direction."

AGA has a collaborative approach to working with other companies, too. AGA has long provided offshore medical evacuation services, in recent years sourcing medical crewmembers from South African Paramedic Services, owned by Neil Gargan. Now, Gargan has launched a new company called Airborne 24, which has partnered with AGA to expand its HEMS offering with a focus on serving private patients.

To this end, Airborne 24 and AGA have removable medical interiors for both the EC145 and the LongRanger, including stretchers,



ventilators, oxygen, syringe drivers, full cardiac 12-lead ECG monitors with capnography and saturation monitoring, and medical packs. Airborne 24 contributes advanced life support (ALS) paramedics and medical licensing to the partnership, while AGA is responsible for the aviation services and certifications.

According to Gargan, the EC145 has brought a new level of HEMS capability to the region. "There are very few helicopters in South Africa particularly . . . that can transport two stretcher patients if we require," he said, also emphasizing the EC145's twin engines and full IFR capabilities. Meanwhile, the backup LongRanger, which has nearly identical medical equipment, also serves a valuable niche: "During normal daylight operations with the patient stable from a hospital to another one, we'll use the LongRanger, which cost-wise is ideal for medical aid."

Gargan sees potential to expand Airborne 24 both within the country, and beyond. "South Africa is [a] limited market, and Africa itself is very much a potential market. So yes, we are looking outside of South Africa as well," he said.

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AGA's EC145 is occasionally called upon to perform VIP charter or tour flights, particularly for customers who demand twin-engine reliability.

Meanwhile, Pitcher has been working to add Mi-8s back onto AGA's operating certificate, which could further expand its international operations. At press time, he expected his first Mi-8 to arrive in country by the end of the year.

"We're looking forward to having the Mi-8s back in South Africa,"

he told *Vertical* in October. With them, he said, "[we're] planning to go back into the United Nations World Food Programme, and doing our humanitarian work, which we did in Africa before."

For Le Roux, it is the missions in which AGA brings all of its talents and technology to bear in helping others that he finds most rewarding.

> "My favorite kinds of missions are the ones where you feel like [you've] really made a difference in someone's life," he said, giving the example of transporting a patient who otherwise would have had no hope of reaching definitive medical care.

"You might fly out as it's getting dark into an unlit, unprepared area somewhere [using] NVGs . . . and then fly back in IMC [instrument meteorological conditions], doing IFR," he continued. "That's not something you can do in South Africa very often, so we're very privileged that we get an opportunity to do that kind of flying, and I wouldn't trade it for anything else."



Elan Head | An award-winning journalist, Elan is also an FAA Gold Seal flight instructor with helicopter and instrument helicopter ratings, and has held commeroter licenses in Canada and Australia as

cial helicopter licenses in Canada and Australia as well as the U.S. She is on Twitter @elanhead and can be reached at elan@mhmpub.com.



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Classic Rotors' Boeing-Vertol HH-46E lands after a cross country flight from MCAS Cherry Point, where it had been flown as a base search-and-rescue aircraft. After some inspections, the helicopter will take to the sky again.





THE CLASSIC ROTORS MUSEUM IN RAMONA, CALIFORNIA, CELEBRATES HELICOPTER HERITAGE, PROVIDING VISITORS ACCESS TO A UNIQUE COLLECTION OF OVER 40 RARE AND VINTAGE ROTORCRAFT.

#### **STORY & PHOTOS BY SKIP ROBINSON**



As one of only a few dedicated rotorcraft museums in the world, Classic Rotors, located in Ramona, California, is committed to the preservation and restoration of rare and vintage rotorcraft. And, whenever possible, it seeks to maintain them in flyable condition.

Billing itself as "The rare and vintage rotorcraft museum," the facility, located in San Diego county, is an all-volunteer organization. Beyond its work in preserving classic rotorcraft, the museum's mission is to provide education and demonstrate various designs in main rotor technology, including tandem, co-axial, intermeshing, and tip-jet powered blades, and of course the conventional main and tail rotor designs. The museum also aims to honor the pioneers of rotorcraft design, including Igor Sikorsky, Frank Piasecki, Arthur Young, Stanley Hiller, Charles Kaman, and Frank Robinson — the latter considered a significant modern-day helicopter pioneer by Classic Rotors' founder Mark DiCiero.

DiCiero's involvement in the world of rotorcraft began when he built and learned to fly his own helicopter in the 1980s. In 1989, after looking through a trade magazine called *Chopper Shopper*, he stumbled upon a potentially flyable Piasecki CH-21B Workhorse. The tandem-rotor piston-powered helicopter had originally been deployed by the U.S. Air Force for Arctic rescue conditions. Not knowing much about the aircraft, DiCiero



1

1 // In 2013, Vertical took part in a historic flight of three generations of U.S. Army medium lift helicopters: Classic Rotors' Piasecki CH-21B Workhorse, Wings and Rotors' Bell UH-1B Huey, and a Sikorsky UH-60 from the California Army National Guard. 2 // Mark DiCiero stands by a tandem rotor remotecontrolled helicopter in front of a painting of the museum. His passion for helicopters, matched by that of the museum's volunteers, has brought Classic Rotors to where it is today.

ARM





researched it, and after talking to his friend Bruce Rodger, they decided to purchase it and restore it to flying condition.

"It took virtually every weekend and many nights [over 18 months], but with the help of talented friends we were able to bring the aircraft to flight status," DiCiero told *Vertical.* The pair then started taking the Workhorse to airshows to help pay for its costs.

A few years later, DiCiero asked the paint shop at Naval Air station North Island in San Diego if they would paint the U.S. Air Force CH-21B into U.S. Army markings to protect the aircraft's bare metal. The Navy agreed to the interesting request, making it a

training event for its new painters, while DiCiero supplied all paint and painting supplies.

In 1992, DiCiero officially founded Classic Rotors — with the CH-21B serving as the main display aircraft. Now, after over a quarter of a century, and with solid support from many volunteers and financial donations, the museum has over 40 rotorcraft in its ever-growing collection.

"WE HAVE LIMITED FUNDS TO ACQUIRE HELICOPTERS AND SUPPORT EQUIPMENT, BUT [OUR VOLUNTEERS'] KNOWLEDGE, EXPERIENCE AND DEDICATION TO RESTORING AIRCRAFT AND ENGINES TO FLIGHTWORTHY STATUS OR STATIC DISPLAY ARE WORTH A FORTUNE."

"Since we are an all-volunteer, non-profit museum, our success is based on donations, memberships, sponsors and the support of our dedicated volunteers," said DiCiero. "We have limited funds to acquire helicopters and support equipment, but [our volunteers'] knowledge, experience and dedication to restoring aircraft and engines to flightworthy status or static display are worth a fortune."

The museum has a long list of rare helicopters in its collection, most of which are complete and potentially flyable. These include the Sikorsky HH-52A, H-19, S-52 and the large twin piston-engine S-56/CH-37 heavy transport helicopter.

Kaman is represented through an HOK (the U.S. Marine Corps version of the H-43A, which has intermeshing rotor blades. The tandem-rotor HRP, H-25/ HUP-3 (Canadian Navy), and CH-21B Workhorse represent Piasecki, and the museum's tandem-rotor collection recently grew through the acquisition of a Boeing HH-46E Sea Knight.











From Russia, Classic Rotors has a coaxial-rotor Kamov Ka-26 and a Mil Mi-2 utility helicopter, while the French are represented with an Aerospatiale Alouette III and a Sud-Ouest S.O.1221 Djinn. From the U.K. is a Royal Navy Westland Wasp HAS.1, which gained fame during the Falkland War of 1982.

Closer to home, an open-cockpit Bell 47B is in the museum's collection in an agricultural configuration. The museum also has several Hiller Helicopters models, including the UH-12C, the YH-32 Hornet tip-jet powered helicopter, and a one-off Camel (collapsible air mobile equipment lifter) turbine helicopter. RotorWay Helicopters is represented with an early Scorpion 133 and its latest Exec 162F, while the long-lived model 269A/TH-55 and OH-6N "Notar" represent MDHI/Hughes.

"We are always on the lookout for new additions to the museum," said DiCiero, noting the recent acquisitions of a OH-6N "Notar" prototype and a former U.S. Coast Guard Sikorsky HH-52A Seaguard.

"The Seaguard needs an engine and some other parts but is overall in good condition," he said, adding that the museum was "thrilled" to get the OH-6N. "It's a very interesting advancement



in helicopter technology, and that's exactly what we are always looking for."

#### **AN EXPANDING COLLECTION**

Among the museum's more unique rotorcraft are the Monte-Copter Model 15 Tri-phibian, the four-place tandem-rotor Jovair/ McCulloch YH-30/MC-4, the Bölkow Bo.102, the Benson B-8 Gyrocopter, the Allied Aerospace Ring Wing, the Goodyear GA-400R Gizmo, the McCulloch J-2 Gryoplane, and the Convertawings Model A Quadrotor.

The museum also has a former U.S. Navy Gyrodyne QH-50A coaxial drone. "These were remote controlled and launched from the rear deck of Destroyers carrying torpedoes to attack submarines," said DiCiero. "These drones were mechanically fine, but the datalinks weren't reliable and many were lost when contact was lost between the QH-50 and its ship."

Restoration of helicopters is an ongoing effort at Classic Rotors, with several aircraft typically being worked on at any given time. The museum's main focus at the moment is a 1948 Piasecki HRP-1 and a former U.S. Army Sikorsky CH-37B Mojave.









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The latter was the first true heavy-lift production helicopter, and it was flown by both the Army and Marines until the late 1960s. Classic Rotors obtained the Mojave in 2013 from the Evergreen Aviation & Space Museum in fairly good condition, but it will need years of work before the museum can even do a ground run with it to show the world what the twin Pratt & Whitney R-2800 2,100-horsepower piston engines and rotor system sounded like.

The HRP-1 is much further along in its restoration, with Classic Rotors having worked on it for the last 4.5 years. The museum's staff have painted the fuselage structure, restored the cockpit area, and cleaned the dynamic systems. Soon, they will test run the engine.

"The guys are dedicated to this machine," said DiCiero. "Once the complicated rigging is completed and all the small things are finished up, we plan to run and engage the rotor — and then, after many flight checks, we will hover it!"

Among other work in the pipeline is a new engine for the museum's CH-21B, "but other than that, it's a sorted and flyable aircraft," said DiCiero.

The museum's HH-46E — which served as a search-and-rescue aircraft at MCAS Cherry Point, North Carolina, until it was retired in 2015 — could also be flown after some inspections. Classic Rotors pilots Howard Northrop and Chip Lancaster (both experienced former Navy CH-46 command pilots), accompanied by museum director/mechanic Joe Gwizdak, flew the aircraft cross-country from North Carolina to San Diego over three days and 18.8 hours flying time. According to DiCiero, the crew had very few problems with the 46 during the flight.

In 2002, during a "Tribute to Frank Piasecki" event with the San Carlos, California-based Hiller Aviation Museum, 1 // Restoration is continuing on the Piasecki HRP to ensure the aircraft will run in the future. 2 // Northrop sands the HRP's floorboard. 3 // The cockpit of the CH-37. 4 // The CH-37 will be the largest restoration project for the museum.





Classic Rotors was able to bring together a grouping of tandem-rotor helicopters covering four generations: a Piasecki HUP and H-21, and a Boeing CH-46 and CH-47. The event was made possible with the assistance of the U.S. Navy and the California Army Air National Guard, which brought the CH-46 and CH-47, respectively. A private owner brought the HUP. The four helicopters hovered together for a special group photo. "It was an awesome day with a very significant family of helicopters," said DiCiero.

#### **A VOLUNTEER EFFORT**

Now that all the core museum members are retired, most are able to put more time into accomplishing the museum's long-term goals. One of the major goals is to get more stable funding to help the museum to continue to acquire new aircraft, and cover the cost of restorations and daily operations.

"We really need more hangar/display space for additional aircraft and more square feet for each display," said DiCiero. "This is important as we want visitors to get the best view of the projects."

DiCiero has a long list of aircraft he'd like to acquire for the

museum, ranging from a Bell-Boeing MV-22 Osprey to bring a tiltrotor into its collection, to an attack helicopter like the Bell AH-1W Super Cobra.

"When retired, a Sikorsky CH-53E Super Sea Stallion . . . would complement our Sikorsky CH-37C - having both would represent the 30-year progression of American heavy-lift helicopters from piston engine to turbine technology," he added.

Also on his Sikorsky wishlist is a U.S. Navy SH-3 Sea King and its stablemate, the HH-3E Jolly Green Giant, which were both significant aircraft throughout the Cold War.

A Kaman SH-2 Seasprite, with its "interesting rotor design" is also a target, as are more Russian-made helicopters, such as the Mil Mi-6, Mi-8, and Mi-24. "We'd love to obtain the huge Russian Mi-6 as it was the first heavy-lift helicopter and an engineering marvel of its time," said DiCiero. "The only problem is finding one and paying to ship it to America."

Finally and more locally, DiCiero would like to obtain the three different Robinson helicopter models - the R22, R44, and R66 — for a large display on that company's founder, Frank



Robinson. DiCiero said such a display would be appropriate considering Robinson is based in California and the impact the company has had on the helicopter industry.

Reflecting on the museum's growth and its success over the past 26 years, DiCiero praised its "unbelievably talented" volunteers, whose wide-ranging skill sets provide the organization with the ability to finish even the most difficult restoration jobs.

"We have guys who are experts in sheet metal, welding, mechanical assembly, piston and turbine engines, and even forming new windows for out-of-production aircraft," he said. "It's quite amazing when we hit a wall on a project — out of nowhere, someone will come up with an idea to complete the job.

"I can't thank everyone enough. [The volunteers] have worked so hard to further the museum's interests, they put in many, many hours, never complain, and are always moving forward."

It's the volunteers that make a visit to the museum such a great experience. Not only are the aircraft kept in a beautiful condition, but the staff are eager to chat about the museum's unique fleet and share their knowledge. If you're in Southern California and have a passion for helicopters, the museum is well worth a visit.



Skip Robinson | Skip has covered helicopter operations through photography for 25 years and has worked with *Vertical* Magazine for over a decade. His main interests are rescue, parapublic and military operations. Skip is based in Los Angeles, California.

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High in the Pyrenees mountains, the small Principality of Andorra presents a challenging operating environment for helicopters — one that Heliand is meeting with a brand-new Bell 429.

GRAN

STORY BY SAMUEL PRETAT // PHOTOS BY ANTHONY PECCHI

// DIGITAL BONUS

A Bell 429 operated by Heliand flies over the Pyrenees mountains in the operator's homeland of Andorra, which lies between France and Spain.



The arrival of the Bell 429 in Andorra opened new possibilities to Heliand, with the machine being well suited to mountain operations with a good safety margin. The operator's initial tests of the aircraft in Switzerland showed its promise.

Spanning just 181 square miles (486 square kilometers) of the eastern Pyrenees mountains that separate Spain and France, the landlocked Principality of Andorra is one of the smallest countries in Europe, both in terms of land size and population. However, Andorra's defining feature is not its size, but its elevation. At 3,360 feet (1,020 meters) above sea level, its capital city — Andorra-la-Vella — is the highest in the continent. The average elevation in the country is 6,549 feet (1,997 meters), with large slopes running down three major valleys that descend from 14 mountain summits exceeding 8,200 feet (2,500 meters). Because of this, it's easy to see how helicopters have come to play an important role in the country, for local authorities, businesses and tourists. And for more than 30 years, those helicopters have been provided by Heliand.

With a staff of 10, Heliand operates three helicopters in its fleet: an Airbus AS350 B3, an Airbus EC135 P2+, and a new Bell 429.

The aircraft are always crewed by two people: a pilot and a task specialist. The 429 is used for Heliand's government service operations, which span search-and-rescue (SAR), helicopter emergency medical services (HEMS), and firefighting, as well more specific public service operations — such as shelter support, snow condition control and layer measuring, and assistance to mountain trackers.

The company's commercial activities include aerial lifts, construction, and heli-ski/heli-bike flights in the winter and summer,



Introducing a new machine requires new certifications for all personnel, including the rescue teams from the Andorran government. The size difference between the older EC135 P2+ and the new Bell 429 has made a big difference for rescue operations at altitude.



respectively. The AS350 B3 is generally used for these operations. Heli-ski and heli-bike flights are a potential area of growth for the company, according to pilot Jordi Duera, who has been with the company since its early days. "These activities really are developing," he told *Vertical.* "Another Ecureuil [AS350/H125] will replace the 135, but it will be mainly used for VIP transport, sightseeing flights and airport shuttles to and back from Toulouse and Barcelona."

Before the formation of Heliand, helicopter operations in the small principality were much more complicated, said Duera.

"When there was a need for a chopper, we were used to calling abroad, to Héli-Union for instance," he said.

This changed in December 1987, when two Andorran partners decided to establish a home-grown helicopter company — Heliand. To start the business, they purchased an Airbus AS350 B2 and an Aérospatiale SA 315B Lama — aircraft well suited to Andorra's mountainous environment.

"Both machines were flying all over the country — the Ecureuil [AS350 B2] specializing in rescue, when the fire brigade called for support, for example," Duera said. "After a few years, the government realized they actually needed their own helicopter because mountain rescue was becoming more demanding. That's when they signed the first contract between Heliand and the government of Andorra to have a helicopter exclusively dedicated to state missions."



The controls commonalty between the Bell 429 and the Ecureuil B3 was a pleasant surprise for the Andorran pilots, who quickly mastered their new aircraft.





That contract was signed in the late 1990s, and due to aviation regulations introduced at the time, Andorra needed a twin-engine machine to be able to land on rooftop hospital helipads in Barcelona and Toulouse - the two nearest major cities.

The Lama was eventually replaced by a factory-new EC135 P2+, with the AS350 B2 kept for mountain jobs. (The B2 was itself replaced by an AS350 B3).

"They were very happy with the Lama, but it was a single-engine helicopter [that became] increasingly expensive to operate and quite noisy," said Duera. "So the 135 was exclusively devoted to medical flights, but also to mountain SAR with the fire brigade's intervention team."

Due to the evolution of flying rules applied to public service missions - particularly when the operator had to fly abroad and the demanding nature of work unique to Andorra, Heliand recently decided it needed to further expand the fleet with a new type.

"[The EC135 P2+] was often limited when operating in high and hot conditions," said Duera, "With more and more restrictive rules, we had to cut on fuel each time we had to go abroad and it became a serious limitation when flying to Barcelona in summer. We had to fill our tanks there, with all the local technical and administrative hassles it means."

#### AN EXPANDING FLEET

Three helicopters were shortlisted by Heliand for its new fleetmember: the H135, the H145, and the Bell 429.

"We are two full-time pilots here, and we decided that one of us would evaluate the Airbus machines and the other the Bell.," said Duera. "Our job was to collect all the data and come back with a proposal."

Duera travelled to Switzerland to try Air Zermatt's Bell 429 in conditions that were as close as possible to Heliand's requirements. "I was very positively surprised," he said.

After a "very strict" selection process, Duera said the 429's payload and gross performances helped tip the balance. The aircraft is certified by the European Aviation Safety Agency (EASA) with a maximum takeoff weight (MTOW) of 7,000 pounds (3,175 kilograms).

"This twin-engine helicopter replaces our EC 135P2+ for all missions encompassed in our contract with the Andorran government," he said. "It is much more powerful, perfectly suited for



Heliand's staff of 10 people is augmented by mountain rescue specialists from the Andorran government.



mountain flying under strong winds, [and] it has a larger cabin and latest-generation avionics featuring autopilot."

Duera praised the aircraft's performance, even when fully loaded. "Once you have loaded the [medical] equipment, the patient, the medical team, the fuel... we almost reach the certified MTOW. On paper, the margin is narrow and we must count every kilogram. But then, the helicopter lifts like a feather and we feel very safe, even when flying on one engine.

"When we take-off from the Andorra hospital helipad, it flies like a jetplane, whether it's hot or windy," he added.

The pilots also really like the way the user-friendly interface was designed.

"The Swiss team at Zermatt helped us a lot," said Duera. "They trained us and pointed at the features incorporated by Bell when they designed their helicopter. Bell listened carefully to what the mountain pilots wanted."

Among these features are the "very efficient and reactive" tail rotor - the first four-bladed tail rotor on a Bell helicopter - and a "very intuitive" pilot interface.

"The avionics suite integrates a flight limitation Indicator, an





all-in-one needle displaying the first data reaching the red zone between torque, engine temperature and measured gas temperature," explained Duera. "It allows the pilot to read only one indicator for three hard limitations. On my first flight, the instructor told me, 'Since you already know the B3, I [will] start your helo to save time and you'll see, the 429 will come to you easily.' I had never flown this model in my life, but he was right — I found everything naturally. It was very easy to take control."

However, selecting the 429 did present some complications with regard to aerial regulations. "Andorra is not part of ICAO [the International Civil Aviation Organization], but we must comply with all [its] regulations," said Duera. "So we had to partner with a company already fully certified in our range of operations. When changing the type, it is very complicated to update all the procedures: you need to get new manuals, adapt to a new machine, requalify the pilots and the maintenance crew. . . . As we had to get all the proper certifications, we selected the registration

The Bell 429 is a mountain flying specialist, and many options are available to enhance its operations in the mountains, including a bubble-window, hoist, bear-paws and, now, a hand-held avalanche radar.

directly in regard to the operator we needed to partner with."

Heliand turned to a Swiss firm, Zurich-based Lions Air, which was fully certified for HEMS, hoist work, and night vision goggle operations. "Above all, they had a Bell [429] in their fleet," said Duera. "It all went very smoothly, they are real pros and we got along very well. We purchased the helicopter and we registered it under their AOC certificate. Now we have this Swiss machine flying in Andorra."

The diversity and complexity of Andorra's mountainous environment is very demanding on helicopters, but Heliand believes it is well on the way to finding the perfect fleet balance for the requirements of its main contract (with the government) — as well as having a fleet that puts it in full compliance with the regulations of both neighboring countries. Despite working in one of the smallest countries in the continent, the quality of Heliand's operation is more than making its mark in the European helicopter industry. Switlik's gear is used by some of the largest HEMS operators in the U.S. and Australia, as well as by aerial law enforcement, firefighting, and oil-and-gas operators around the world.



In the last two years, Switlik has started selling its aviation life rafts again. Switlik's Inflatable Single Place Life Raft (ISPLR) is utilized by pilots and mariners who are serious about their personal lifesaving equipment.

(SWITBK)

## GENERATIONS OF SAVING LIVES

After nearly a century of business, Switlik Survival Products is well-known for its life vests, suits and aviation life rafts, and intends to stay "ahead of the curve" with its product designs.

#### BY DAYNA FEDY // PHOTOS COURTESY OF SWITLIK

When thinking of safety and survival products in the aviation industry, the name Switlik may spring to mind. It's a name that has been part of the industry for nearly a century, best known from the company Switlik Survival Products.

Based in Trenton, New Jersey, the family-run business is renowned for its life vests, anti-exposure suits and life rafts. It all began in the early 1900s, when Stanley Switlik, an immigrant from Poland, was offered an opportunity to work in Trenton at a canvas and leather goods company. After buying the company in 1920, he began experimenting with parachutes and designing flight clothing — due to heightened interest in aviation at the time.

During the Second World War, Stanley's business was manufacturing roughly 2,000 parachutes per week for the U.S. Army and Navy. When commercial aviation opened up, the company transitioned into other product areas — predominantly staying within the realm of safety and survival equipment.

Nearly a century and four generations of Switliks later, the company's roughly 120 employees help make the industry safer with life-saving products, continuing the legacy established by Stanley so many years ago.

"Even though there are only two family members, if you will, in the building right now, we run the whole business like a family business," said Sarah Switlik, vice president of sales and marketing, who represents the fourth generation of Switliks working for the company. "Being privately held . . . we're able to be a lot more flexible both in the products that we're developing and selling, and the projects we take on."

Switlik's gear is used by some of the largest helicopter emergency medical services (HEMS) operators in the U.S. and Australia, as well as by aerial law enforcement, firefighting, and oil-and-gas operators around the world. The company's products are also used by the U.S. Navy, U.S. Marine Corps and U.S. Coast Guard.



Stanley Switlik II, current owner of Switlik Survival Products, stands with his daughter Sarah Switlik, vice president of sales and marketing, among hundreds of Switlik life vests at the company's facility in Trenton, New Jersey



The company's roughly 120 employees are all based at Switlik's manufacturing facility in Trenton, making it easier to be flexible on the production floor to reduce lead times when necessary.



Along with Switlik's main manufacturing headquarters in the U.S., the company is able to expand internationally through a global dealer network.



Switlik employee supervises life vest sealing. Once produced, life vests are inflated and left overnight to ensure the pressure has not changed.



Pictured is the production process of the ILV-20 infant vest. Switlik's infant life vest is used by many airlines around the world.

A staff member is shown constructing Switlik's unique convertible canopy for life rafts. The canopy allows raft users to keep the elements out in extreme weather conditions.



#### **ALWAYS EQUIPPED**

Whether its customers fly commercially, for a government agency, or the military, Switlik covers all bases with its survival products.

"Our biggest product is our constant-wear life vest, either for passengers or for pilots," said Sarah. "We've been doing those since the early '80s."

The company's X-Back constant-wear life vests are well-known by aviators who often fly missions over water, with a design that makes them easier to wear for longer periods of time without compromising safety. Stanley Switlik II (Sarah's father and the company's current owner) is passionate about creating life vests that are both safe and comfortable.

"My dad, Stan — he's an engineer — he read something online that said, 'I love this vest, but it's uncomfortable around my neck,' and he really took that to heart and designed a new product," Sarah explained. "We reorganized the components of [the vest] to remove all that weight and bulk from the shoulder area to provide more freedom of movement."

She added that the design doesn't interfere with other equipment that helicopter crews are required to wear, including harnesses.

And the bright-orange design of Switlik's suits may be a familiar sight in the field. The company's U-Zip-It anti-exposure suit was originally designed for the U.S. Coast Guard, which still uses the product, but is also beneficial for pilots and crews during search-and-rescue missions or over-water operations, particularly in cold weather. The suit is made from flame retardant, waterproof PTFE fabric, and as suggested by the name, has a zipper placement that is "designed for better freedom of movement and easier donning."

In the last two years, Switlik has started selling its aviation life rafts again. These are used for the safety of helicopter crews and passengers in the event of a ditching, or can be dropped by crews to people in the water — the latter scenario is executed with Switlik's airdrop raft, which is good for both private and general aviation aircraft.

When designing vests, suits or rafts for military customers, the process becomes even more detail-oriented. "The military side is much more technical and products are held to a high military quality standard," said Sarah.

#### **HOLDING HIGH STANDARDS**

Whether designing and manufacturing products for military or civilian operators, the testing process is not something Switlik takes lightly. "Everything that goes through the building has to be held to the highest level of quality standards," Sarah said. "The products we make need to work."

Switlik practices "100 percent quality testing," which means every vest, suit or raft that is made gets tested before leaving the building — everything receives the same treatment, right down to the most entry-level products.

"Every single life vest we make gets inflated and left overnight, and then we check the next morning to make sure that no pressure has changed," she said. "And the same with our suits. We're doing at least one, if not two, full inspections on the suits . . . [including] watertight inspections to make sure there's nothing seeping through."

Switlik can deliver life vests to customers with an average leadtime of just one to three weeks, as the vests are typically in stock. A larger order of 30 to 40 vests, however, may increase that lead-time to three to four weeks. On the other hand, Switlik's suits are custom-made to order, so customers can expect delivery of suits within roughly six weeks.

Having all its employees based at one facility allows the company to be flexible on the production floor to reduce lead times when necessary. "We can shuffle things around because we're all right in the same building here," said Sarah. "We can prioritize orders if and when they need to be."

#### **NEW TERRITORY**

Having secured success with its current product offerings, next on the horizon for Switlik is its recently-launched comfort technology division. This will showcase a new manufacturing process, entering the market with a new sealed foam technology that allows the company to make a different kind of inflatable structure.

The idea originally developed from a project with DARPA (the Defense Advanced Research Projects Agency — an agency of the U.S. Department of Defense), where Switlik was trying to make a better ejection seat for fighter jet pilots. Sarah said foam with a sealed surface could be molded into unique shapes, providing the potential to build the type of inflatable structure that can't be made with just air and fabric.

Switlik is currently using the foam technology in a mattress as a starter product to showcase its abilities.

"Once people see how it works, we can hopefully transition into other comfort and style products, but also see how we can circle back into our survival products with the technology," Sarah added.

With its life vests and anti-exposure suits, the company recently adapted these products to break into the oil-and-gas market in the North Sea in Europe. After European aviation authorities laid down new safety regulations for offshore helicopter operations in the North Sea, Switlik redesigned its X-Back vest and U-Zip-It suit to comply with stringent design and performance characteristics.

"The oil-and-gas market in the North Sea hasn't seen any new [survival suit manufacturer] players in a while," said Sarah. "They have A Switlik employee tests flight suits. The company takes product testing very seriously, ensuring every single life vest, suit, and raft receives 100 percent quality testing before leaving the facility.



some pretty tight approval restrictions, but we finally got approved." The company hopes to gain further exposure in Europe with its redesigned European Technical Standard Order-approved suit and vest.

Moving forward, the company intends to focus on innovation and staying "ahead of the curve." Sarah told *Vertical* that Switlik is doing more research and exploration into underarm flotation and better ways to solve problems with current products on the market.

"We've always held [the view] that we need to be conscious of getting products to market before others, and just remaining innovative at all times," she added. "But what we do is we try to make a better product.... We've been at it longer than anybody else."



**Dayna Fedy** Dayna is junior editor of *Vertical* magazine. She completed her undergraduate degree in communication studies in June 2017, joining MHM Publishing later in the year to pursue a career as a writer and editor.



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# There I Was...

written by Zaron Welch

The Gift of Flight

I'm not sure if you've ever been to eastern Montana in early March, but it's cold. It's also not the most visually stunning time of year to visit the northern Great Plains. I know this because, one March, a seismic job took me east of Shelby for a few weeks. Over the 160-ish square acres we surveyed, I counted two trees and about eight houses among the wheat fields and cattle lands.

One morning, after our safety meeting, one of the men working for our customer asked if I would be willing to take his young son — we'll call him Zach — for a flight. He explained that Zach had recently been released from hospital after winning a battle with cancer. The boy had spent most of his five years in and out of hospitals, but loved flying. He especially loved reading anything about planes, helicopters, airships; anything that could fly. His dad was certain he'd love nothing more than to get to fly in a helicopter.

Knowing how excited five-year-old me would have been to go on a helicopter ride, I was more than happy to help. My old boss will be glad to know that I still managed to make some money from the flight, even though I would have done it for free. Zach's dad and I decided that he needed to do a field inspection after a recent thaw had muddied up some fields. Obviously we didn't want upset land owners. It was completely legitimate.

Zach and his dad came by the landing zone the next morning. It was gray, overcast, and cold. While I like to think I'm a decent conversationalist, I've never claimed to be great with children. I'm also pretty sure that a tall, bearded stranger isn't the most endearing figure to a small child. Even so, I could barely get a word from that kid. I let him get some pictures behind the cyclic, explained all the lights and dials and gauges, and asked him every question I could think of. Not a peep. "Oh well," I thought to myself. "Perhaps he'll light up once we get in the air."

Zach was small, a result of his difficult life so far, and the frozen headsets were almost as big as his head. I gave him the left seat in the back of my AStar; his dad sat beside him. If Zach really stretched, he could see over the lip of the window. As we lifted off for our grand tour of the dreary Montana countryside, Zach barely seemed to notice. I'll admit it wasn't the most picturesque day, but I had hoped for more enthusiasm. During our almost half-hour flight, I was hard pressed to get more than a syllable out of him. Desperate, I asked, "Do you want to see something an airplane can't do?" and then proceeded to do three or four pirouettes through the air.

Nothing.

I was a failure as a pilot.

We flew back to our staging site and shut down. Zach made sure to thank me, then mostly hid behind his father's leg while his dad and I chatted a bit about the flight. His dad was very grateful and assured me that Zach had enjoyed himself very much. We took a few more pictures and they got into their car. I remembered that I had a few issues of *Vertical* with me — reading material for the plane ride to work — and caught them before they drove off.

"Zach, your dad said you liked reading about flying, so I want you to have these magazines," I said. "There are lots of neat stories and cool pictures."

They thanked me and were off. The next morning, Zach's father caught up with me at the briefing and thanked me again. I told him I hoped Zach had a good time, but that he didn't seem very interested. "On the contrary," I was told. Apparently, from the moment they started driving away, until the second he fell asleep, and then again all morning, Zach had been talking — nonstop — about how awesome helicopters were.

"Dad, did you see when we were spinning around in the air? Airplanes don't do that!"

Finally I felt as though I'd given the flight that five-year-old me would have enjoyed.

"Oh, and thank you for the magazines, too," his father said. "He was so excited, he made me read his bedtime story from the magazines last night."

Oh?

"Yeah, that's how I ended up spending 45 minutes reading a story about marijuana interdiction flights in the Pacific Northwest to my five-year-old son. He loved every minute."





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