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Our Publications









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8 The Team

GROUP PUBLISHER Mike Reyno ■ mike@mhmpub.com

GROUP PUBLISHER Linda Reyno ■ linda@mhmpub.com

ASSOCIATE PUBLISHER

Derek Kast ■ derek@mhmpub.com

EDITOR-IN-CHIEF Oliver Johnson ■ oliver@mhmpub.com

SPECIAL PROJECTS EDITOR

Elan Head elan@mhmpub.com ASSISTANT EDITOR

Ben Forrest ■ ben@mhmpub.com JR. EDITOR

Dayna Fedy adayna@mhmpub.com COPY EDITOR

Amitav Dash amitav@mhmpub.com

SALES & MARKETING DIRECTOR Tim Muise ■ tim@mhmpub.com

MARKETPLACE SALES MANAGER Carla McKay ■ carla@mhmpub.com

CIRCULATION MANAGER

Leanne Willis ■ leanne@mhmpub.com

PRODUCTION MANAGER Jen Colven ■ jen@mhmpub.com

GRAPHIC DESIGNER

Kaytlyn Wismayer ■ kaytlyn@mhmpub.com

WEB DEVELOPER

Shawn Pieters ■ shawnp@mhmpub.com

CONTRIBUTING WRITERS: John Carinha, Thierry Dubois, Geoff Goodyear, Christina Hogarth, Kim Hutchings, Don Porter, Skip Robinson, Andy Roe

CONTRIBUTING PHOTOGRAPHERS: Sheldon Cohen, Greg Doyle, Bryan Dudas, Sean Dundas, Brian Edwards, Michael Gilbert, Will Graham, Lloyd Horgan, Dan Megna, Maur Mere, Heath Moffatt, William Murdock, Anthony Pecchi, Skip Robinson, Bart Rosselle, Benjamin Schaefer, Ognyan Stefanov, Charles Vowles, Marc Witolla, Sven Zimmermann



500 Trillium Dr., Unit 23, Kitchener, ON N2R 1E5 In the United States:

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They have many names these days: officially they're variously referred to as unmanned aerial vehicles or unmanned aircraft systems, but most of us know them as drones. Simply put, they're aircraft of various shapes and sizes without the encumbrance of a cockpit or resident pilot. The technology behind these aircraft has advanced at an exponential rate, and the only thing that outpaces the technological developments is the proliferation of the units themselves. They are the aviation equivalent of rabbits.

I can understand the explosive growth of the drone community, as its purveyors realize that one no longer needs to endure ground school and flight training to be a pilot! What an age we live in.

This phenomenon has the potential to turn our industry's business model upside down, and the sheer volume of these critters in low level airspace obviously increases the chances of a mid-air collision for those of us that live there. Both present huge risks, but for the purpose of this discussion, we will focus on the safety implications.

These amazing machines have all kinds of features to offset the lack of flight experience by the operator. And throwing caution to the wind, I was compelled to get one to "pursue aerial photography projects," as I rationalized to my spouse. (Essentially the same process every dad goes through trying to convince his infant son that he absolutely needs a scale model train set.) The beast (a.k.a. the drone) is virtually ready to fly right out of the box. Contrary to the genetic predisposition of all males, I took the time to read the instructions and determined that my first flight would be in "training mode." The beast's software would stop me from doing something stupid. I chose a suitable location well clear of the airport and the unprotected and started it up.

It worked great! Easy to fly, rock solid and stable, and responded to my control inputs, no matter how erratic. This thing was a snap! I then theorized that my 30-plus years in a cockpit must have played a role in a wildly successful first flight. Confidence was high.

I immediately disabled training mode and waited for an opportunity for an operational second flight. In due course, my wife and I camped out for a weekend at Diver's Brook on the Trans-Labrador Highway: a beautiful little spot just right for getting some fall color video flying low level up the brook. Still feeling flush from my spectacular debut, I made ready for pilotless flight. I started the rotors and took to the sky with the video camera recording it all!

Do you remember that old industry story about the aircraft maintenance engineer (AME) phoning the base to let them know that the aircraft would not start? The base asked the AME to explain why. The AME responded that he and the pilot cannot agree on the point. He says it is because the aircraft is upside down and the pilot says it is because

There are so many [drones] in use now that to assume you will never encounter one in your travels would be a mistake. And when you do encounter one, remember my story and NEVER assume they know what they are doing. it is underwater!

Well, part way into my second flight... my aircraft would not start.

Out of "training mode" this drone was VERY nimble and quick. It scooted down the river at Mach 0.6 and I struggled to get it stopped before it disappeared downstream and over the horizon. I then turned it around in a stable hover in preparation to bring it home. After the maneuver, it seemed rather close to some trees, so I decided to move it out into the center of the stream for the video run back. I moved the control to take it sideways away from the trees. It promptly went in the opposite direction, into the trees, did a triple half gainer of which any Olympic diver would be proud, and ended up... you guessed it, upside down and underwater.

I had not accounted for the fact that when I turned it around, all the controls now worked in reverse! This is a little tidbit that an onboard resident pilot would not be concerned with as they are almost always pointed forward. But apparently a very important consideration if you are flying a drone.

There are a couple of takeaways here (besides the soggy drone). Drones are not as simple to fly as one might assume. All you need to do is watch some of the spectacular failures on YouTube to appreciate that.

There are so many in use now that to assume you will never encounter one in your travels would be a mistake. And when you do encounter one, remember my story and NEVER assume they know what they are doing. Give the beast a wide berth.

While we may be averse to more regulation in aviation, the sooner transportation regulators get a handle on this the better. Because of the drone community's sheer weight of numbers alone, regulation, education and oversight is essential to creating a safe environment.

So if you get a drone for Christmas... be concerned and consider yourself warned!

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In early commercial helicopters, the flight controls were directly linked to the main and tail rotor systems by means of control tubes and cables. Aerodynamic feedback forces from the rotor head made the cyclic and collective pitch levers heavy to control, but on the plus side, pilots could feel any unusual vibrations or out-of-balance or trim conditions — and that helped maintenance engineers stay on top of track and balance issues.

With the emergence of larger helicopters, heavy control forces became too difficult to manage, and hydraulic systems were installed to make flight control easier. These days, most helicopter types have hydraulic controls, and a good helicopter training program will adequately cover how hydraulic systems work and how to safely manage in-flight hydraulic malfunctions.

Hydraulic servos extend and retract like robot arms at an automotive assembly plant. The large hydraulic servos you see on earth excavators and many other machines are able to lift and move very heavy loads. Although smaller in size, helicopter servos still move with a force greater than human limbs can exert. As long as the system runs smoothly, the pilot has control, but if the servos malfunction, flight control could be at risk. You won't win an arm wrestle with a servo.

One instructor I worked with took hydraulics very seriously, and would broadcast a mayday call prior to landing if the hydraulics malfunctioned in any way. He reasoned that the hydraulic servos are placed between the flight controls and the rotors, and a malfunction could jeopardize your ability to control the helicopter. I hadn't thought about it that way before, but his reasoning seemed sound.

I recently saw a good example of pilot flight control failure in a video. An R44

on final approach suddenly became very erratic, landed hard, and then rolled over. Onlookers rushing to the helicopter found the pilot unhurt, happily pointing out that the hydraulics had failed and smiling as if the crash wasn't his fault. The pilot should have been able to manage the helicopter to a safe landing without hydraulic boost, but maybe lacked the training to do so. The hydraulic switch is located on the cyclic, just above the grip, and he may have had "finger trouble" and unknowingly turned the switch off. Even if that is what happened, the accident did not need to occur.

Bell 206 helicopters are good trainers, and have typical hydraulic systems. A mechanically driven pump supplies fluid pressure to open and close the servos. Pilots can choose to block the hydraulic pressure if necessary by closing an electric switch. The switch is activated by turning it to the "Off" position. In other words, the switch is on when you turn the hydraulics "Off." In the hydraulics "On" position, the switch is deactivated or off. This is confusing at first, but with contemplation it becomes clearer.

Without boost pressure, the controls in a helicopter become much heavier to move. Some helicopter types are more difficult to control without hydraulics than others. Learning to land smoothly without hydraulic boost takes repeated practice — not just once or twice — to see what it is like.

Three types of hydraulic malfunctions will necessitate switching the hydraulics "Off" to maintain helicopter control. If the hydraulic pump fails or the system runs out of fluid, you will lose hydraulic boost. First, make sure that the switch is not faulty by pulling the circuit breaker. If this restores the hydraulics, there was probably a short behind the switch. (Remember that if you need to turn the hydraulics off again in this situation, you must push the breaker back in.) If pulling the circuit breaker doesn't restore the hydraulics, push the breaker in and turn the switch off to prevent the hydraulics from somehow returning to service while you have a strong grip on the controls while landing.

Low hydraulic fluid level in the reservoir can cause cavitation in the hydraulic pump, with hydraulic boost becoming intermittent — on for a few seconds, then off, and then on again. In this situation, it would be difficult to control the helicopter with the alternating harder and then easier forces needed to move the controls. By intentionally turning the boost switch "Off," hydraulic boost pressure is released from the system, and the predictable but stiffer movements of the flight controls will make the helicopter easier to control to a landing.

A much more serious malfunction is a runaway servo. Should the cyclic suddenly deflect hard over to full limit in any direction, or the collective extend fully up or down, you must instantly realize what has happened and quickly turn the hydraulic switch "Off" to regain control. Now the affected flight control can be returned to a workable position by forcing the non-pressurized fluid in the servos through the lines. The next time you are out flying, practice reaching for the hydraulic switch without looking for it so that you can access it quickly if you ever need to.

Helicopter pilots learning to fly with boosted controls need good training in how to land safely if hydraulic pressure is lost or a servo "runs away." Without hydraulic assist, flight control is harder to manage, and safe landings will be anything but normal. Students need to know the hydraulic emergency procedures as laid out in the flight manual/pilot's operating handbook and engage in repeated simulated emergency practice to be proficient with hydraulic malfunctions.

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For me, one of the most fascinating things about this field of work is the diversity of tasks it offers. We often hear that some of the more engaging careers offer something different each day. That's certainly true in aviation, where the variety of work can change from morning to afternoon on the same day. Fleet operators know this all too well.

When confined to the four walls that are our hangars and shops, it's easy to get comfortable and arguably complacent and less appreciative of the inventory available to us - and the easily accessible resources. We have the luxury of fellow employees to lean on for support and guidance, a stocked stores room to pull parts from at will, and technical documents to reference for specified data. Taking these operations on the road and offering a mobile service creates a whole different approach to planning and preparing for many unknowns. Perhaps the best attitude to employ is one that expects the best, plans for the worst, and is prepared for surprises.

A recent road trip to a local client exposed this very need to plan effectively. I packed a bunch of hope, a little wishful thinking, a small amount of luck and yes, some tools. The scope of work involved three different aircraft types: a Bell 407, a Bell 212 and an Airbus AS350. The 407 required an audio panel upgrade; the 212 a pitot-static leak test and some troubleshooting of the attitude and directional gyro systems; and the AS350 required a 24-month altimeter and transponder re-certification and a couple of service bulletins to be peformed. With each added task and each added aircraft, the probability of shortcomings was increased.

The 407 audio work came together as I had hoped, with the exception that there were pre-existing faults in the wiring that would later present themselves during post-installation testing of the new panel. In the process of installing the new equipment, the existing equipment was later shuffled to different positions which, of course, usually means either shortening (desirable) or lengthening (undesirable) the respective wire harness length(s). In my case, the harness needed to be lengthened — for which I did not come prepared.

The 212 pitot-static leak tests went as hoped and conformed with the aircraft manual's procedures. The troubleshooting, however, found more wrong than right. No less than three different connectors spread across the two systems were unserviceable; their internal grommets (which keep each wire and contact isolated from one another) had dried, cracked and were disintegrating. These were parts that I would have to order in or ship from my own stores at my office.

The AS350 proved a greater challenge. During the re-certification of the altimeter and transponder systems, two issues pre-

Fear is often dismissed as a weakness, but I view it as a tool. It's capable of beckoning courage, which usually is coupled with knowledge to combat the challenges our line of work often presents. sented themselves. The pitot system drain was leaking due to a cracked O-ring, which was easily replaced. However, the altitude was displayed on an electronic flight display whose air data computer was remotely located. The altitude error fell out of tolerance, which unfortunately is not field repairable without software and a laptop. The unit was removed and sent back to the OEM for an exchange. The service bulletins and their respective kits were delayed in arriving, so all told, it added up to a partially successful trip, but undoubtedly the near future held at least one more visit to rectify all that was outstanding.

What I enjoy most about working remotely, beyond the travel component, is the slight anxiety and/or fear of the unknown it brings. Fear is often dismissed as a weakness, but I view it as a tool. It's capable of beckoning courage, which usually is coupled with knowledge to combat the challenges our line of work often presents. It brings about a very different approach to what would otherwise be quite a procedural challenge when set about in the comforts of our own shops and hangars.

I was recently asked to reflect on my career to this point in my life and assess the take-aways. There are many; too many in fact to fit into this column. That said, when I evaluate what feeds my own drive, what gets me up in the morning and engages me, it truly comes down to challenge and spontaneity - two things that remote work almost always affords. If you are driven by something similar, you can find some level of these attributes in virtually any role in the industry, from building aircraft, to flying, repairing or selling them. Whatever hat you choose to wear, the key is finding the right balance to satisfy your needs while maximizing your effectiveness and efficiency. 🛀



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If you have been in this industry long enough, you have no doubt met your fair share of "experts." However, when it comes to pilots, being an expert isn't always enough when faced with an emergency. And, as crew resource management teaches, final decisions in the cockpit do not always have to come from the captain (or pilot-in-command) if the captain is making an error in action or judgment.

However, this is an idea that doesn't seem to fit naturally in this industry, as aviation tends to prioritize expertise and position, not leadership. Thousands of hours and many years of experience can make someone an expert, but it does not instantly make him or her a leader.

John Maxwell, the bestselling author and speaker on leadership, says that it doesn't just come with a rank or position at the top of an organization. "The true measure of leadership is influence — nothing more, nothing less," he said. Oftentimes, developing the role of leadership is thought to be preserved for corporate or military positions, but leadership can and should be applied to all industries, especially aviation.

There are many reasons why it is important to develop leadership skills in pilots, but one of the most important is because of its impact on safety. For all of us, safety is paramount, and we need experts to provide the best training solutions, seek out answers for causes of accidents, develop tools to enhance safety, and create the most reliable systems and technology but we need a leader to be there in times of trouble. To put it simply, experts prepare people for the cockpit, but leaders need to be in the cockpit.

A leader does not always mean being the person to have the final say, or being the authority on all things, but leadership in the cockpit can mean the difference between making fatal mistakes when faced with an emergency, or keeping a clear head and working through it. When Chelsey "Sully" Sullenberger landed an Airbus A320 on the Hudson River after hitting a flock of geese, he was able to keep his emotions in check, which then kept his cockpit calm. Both he and his co-pilot were able to make quick decisions while maintaining a clear head, but this is not always the case in emergency situations.

In *The Limits of Expertise*, authors Dismukes, Berman, and Loukopoulos discusss how in the several case studies they examined, accidents that stemmed from unexpected events causing high stress and workload led to incorrect decisions being made. These events tended to be unusual, and are not situations that call for routine training. Therefore, when the stress level became high, the crew became vulnerable to errors linked to cognitive processes such as attention, memory, and decision-making.

There is no doubt pilots require extensive training for emergencies, but a pilot's training and knowledge should not be limited to technical skill and expertise alone. Developing leadership skills can benefit a pilot in a time of emergency, especially for those who are flying a single-pilot cockpit, where all decisions need to be made by one person. This seems particularly important given that helicopters generally have flight profiles that allow for less time to respond to an emergency.

Despite thousands of flight hours, emergency procedures training, and muscle memory, a pilot's brain may not be able to override the emotional hijacking that takes place during an emergency. Our brains are designed to help us survive physical emergencies, creating anxiety in order to better suit the bodily threat. Psychologist Daniel Goleman explains that in moments of emergency, the emotional center in our brain — known as the limbic system takes over the rest of the brain. Basically, all our technical training, expertise, and intelligence can go right out the window when our stress level and workload is high and we feel we are in a state of emergency. Which means, as workload and stress increase, situational awareness decreases, and clear decision-making is affected. This is why developing leadership skills around self-awareness and self-management is so important.

According to Maxwell, leadership is a lifelong learning process. "If you don't try out your leadership skills and decision-making process when the stakes are small and the risks are low, you're likely to get into trouble at higher levels when the cost of mistakes is high," he writes.

A leader can't manage his or her emotions well if he or she has little or no awareness of them or their impact on decision-making. Because of this, it's important to build your self-awareness and self-management skills, such as using your gut instincts to help guide decisions, learning to keep disruptive emotions and impulses under control, and becoming comfortable at adapting to changing situations. These skills may keep your brain from hijacking your rational, technically trained mind when the stress and workload is high.

Pilots who work to build their knowledge and expertise, as well as develop their leadership skills, increase their ability to manage high workload and stress, and likely decrease their chance of losing situational awareness and being emotionally hijacked. Developing strong leadership skills is more than just leading and influencing others — and they could one day save your life.



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EASA certifies 505 as Bell grows in Europe



BY OLIVER JOHNSON

n Nov. 12, Bell Helicopter announced the long-awaited certification of the Bell 505 Jet Ranger X by the European Aviation Safety Agency (EASA).

"This is a significant milestone for the Bell 505 Jet Ranger X, and I know our customers in Europe are thrilled to hear the news as well," said Patrick Moulay, executive vice president of commercial sales and marketing at Bell Helicopter. "Our mission with the Bell 505 was to reclaim the short single light market while honoring the Jet Ranger legacy, and the phenomenal customer response is evidence we are on track."

The five-seat aircraft, powered by a Safran Arrius 2R engine, received certification from the Canadian and U.S. regulatory agencies in December 2016 and June 2017, respectively. The Bell 505 has also received certification from the civil certification authorities in Australia, Chile, Guatemala, Indonesia, Mexico, New Zealand, Peru, South Korea, Argentina and Japan. The first production aircraft are now flying with customers in Canada, the U.S., and Chile.

In a media briefing at Helitech International in London, U.K., in October, Moulay said the 505's customers in Europe are spread out across the continent, but highlighted particular interest in Belgium and the U.K. As *Vertical* went to press, the first European customers were set to attend training on the type at the Bell Training Academy in Forth Worth, Texas, and the 505 is expected to make its operational debut in Europe in January 2018.

The 505 is manufactured at Bell's facility in Mirabel, Quebec. The production rate at the facility has been relatively slow until now, but a steep ramp-up is expected to see at least 100 aircraft produced in 2018. The current lead-time for new customers to receive their aircraft is two years.

Bell has high hopes that the 505 will prove popular among law enforcement operators, but it's in the form of another parapublic application - as a military trainer - that the aircraft is already bearing fruit.

"We hope that before the end of the year we'll be able to make some announcements [regarding military orders] — it's a very big strategic segment," said Moulay. "This has come up faster than we anticipated, to be frank, and it shows there is a need in this segment for a new product that, actually, we are addressing."

Meanwhile, Moulay revealed that the UH-X contract for 150 aircraft based on the Bell 412EPI for the Japan Ground Self-Defense Force (JGSDF) includes an agreement to build a further 150 "export" versions of the type in Japan.

The contract, signed by Bell's long-term partner Subaru Corporation (formerly known as Fuji Heavy Industries), will see the new utility transport helicopter replace the JGSDF's existing UH-1J, which is based on the Bell 205.

The impact of this agreement on the production of the 412 in Canada remains unclear.

"The large part of the agreement with the Japan MoD [Ministry of Defense] there is 150 aircraft for their own needs, and 150 aircraft that need to be . . . exported as well," said Moulay. "There will be some exports, so we are discussing with Subaru where that is going to be. But I will not jump into [a] conclusion for what it means for the 412 production line in Mirabel."

The UH-X program is currently in the prototype phase, with delivery of the aircraft to the JGSDF anticipated to begin in 2021.

A GROWING EUROPEAN PRESENCE

Moulay said Europe has become a "key market" for Bell, with the manufacturer making a conscious effort to become less "U.S.-centric" over the last few years. Accordingly, Bell now has a logisitics center, a customization center, a delivery center, and a simulator center in Europe to help support local customers.

"We are doing everything we can to make sure that when [a European operator] buys a Bell product, the entire life cycle is going to be taken care of by a European team," he said. "Down to the retrofit, maintenance, [and] customizing — you have teams locally capable of taking care of you."

The company has had particular success

in the region with the Bell 429, where more than 75 of the type are in operation. During Helitech, Swiss operator Air Zermatt announced it had placed an order for a second 429 for its fleet, after being impressed with the type during the last four years in operation.

"It's a vote of confidence from the customer," said Moulay. "I like to think that when you do the right thing — take care of your customer, and the aircraft is performing the way it's supposed to be — you end up getting more business."

Looking ahead, Moulay said the company remains confident of success with the 19-seat 525 in the North Sea oil-and-gas market, despite the ongoing downturn in the offshore sector.

"We have designed this aircraft dedicated primarily for the oil-and-gas segment, we believe the North Sea is one of the key areas in the world for oil-and-gas, [and] we believe the 525 is going to bring tremendous value to the industry," he said. "The industry is suffering; yes, we are suffering like everybody else; we see exactly the same thing in oil-and-gas that everybody sees; but we do see that in the long term, that segment is going to come back and we'll be there and the demand is for the 525."

Bell resumed flight tests with the 525 on July 7, 2017 — a year and a day after the fatal crash of the first flight test vehicle, which killed two test pilots and resulted in the temporary grounding of the program.

While Bell awaits the final report on the accident from the National Transportation Safety Board (NTSB), it continues to work towards the aircraft's certification, expected at the end of 2018. Deliveries are scheduled to begin in early 2019.

Moulay said the flight tests were "going well," but that Bell has not yet resumed taking letters of intent (LOIs) for the 525. The program had recorded around 80 before the accident.

"From a marketing standpoint, I didn't feel like it was the right time last year, because of the accident, to engage in proactive marketing/selling activities," he said. "I think at some point you need to step back and make sure you have the program back in order. So we have not been taking any further LOIs until the NTSB report has been released."



FIREFIGHTING CONFERENCE RETURNS TO U.S.

The Aerial Firefighting North America conference will be returning to the U.S. in 2018, from March 12 to 14 in Sacramento, California. During the three-day conference, the organizers will aim to address the core issues that are affecting aerial firefighting operations in North America.

The organizers have consulted with the California Department of Forestry and Fire Protection to provide a session for aerial firefighters to debate and present on state aerial firefighting issues. The firefighters will also have the option to impart their experiences to the international audiences at the event.

The conference will include dedicated time for participants to tour the aircraft static display. Aerial demonstrations of civil and military fixed- and rotary-wing aircraft will also take place over the three days.

ABLE GAINS FAA CERTIFICATION FOR AS350 MAINTENANCE

Able Aerospace Services Inc. has been awarded an operations specification by the Federal Aviation Administration to complete airframe and level 1 engine maintenance on the Airbus Helicopters AS350 B2/B3 models.

The specification expands the capabilities of the Able Maintenance Center (AMC), established by Able to provide a full suite of rotorcraft airframe services including maintenance, inspections, airframe repair, avionics upgrade and paint.

The AS350 specification comes with "no limitations," allowing the AMC to conduct planned or progressive inspections, scheduled or unscheduled maintenance, and flight deck upgrades.

A Sikorsky S-70 FireHawk, operated by the Los Angeles County Fire Department, joins firefighting operations in California in October. Greg Doyle Photo

California endures deadliest week of wildfires

BY CHRISTINA HOGARTH

alifornia experienced its deadliest-ever week of wildfires in early October, as devastating blazes in the north of the state killed 43 people, destroyed 8,900 structures, and caused billions of dollars of damage.

At the peak of the destruction, 60 helicopters worked from three different airports to attempt to control the various fires, according to the California Department of Forestry and Fire Protection (better known as Cal Fire).

"This was the biggest incident that I've seen in 15 years within the department," said Tim Stepanovich from Cal Fire's Hemet Ryan Air Attack Base, who worked on the fires as the air operations branch director. "In 2003, we had the Cedar Fire in San Diego that burned for three weeks and destroyed 2,200 homes. The fires in Napa Valley were what I'd call the 'Cedar Fire of the north' on steroids. There were 80-mile-an-hour winds coming out of the hills."

The fires in Northern California — which

included the enormous Tubbs Fire, Atlas Fire, and Nuns Fire — began on Oct. 8 and 9, and quickly spread across Napa, Lake, Sonoma, Mendocino and Solano Counties, forcing the evacuation of 100,000 people and causing California Governor Jerry Brown to declare a state of emergency.

A cocktail of elements contributed to the devastation. "We call it alignment — wind in alignment, canyons in alignment, and fuel in alignment," said Stepanovich. "Last January/ February there was a lot of rain, everything was green and lush, and the grass was growing. More rain is more grass, and more grass means more fire."

Stepanovich said one of the most challenging aspects of fighting a fire of this magnitude was the coordination of air assets. "Everything was stacked like a merry-go-round, all making left hand turns to drop their retardant and then get back out," he said. "We had six radios: air-to-air, air-to-ground, and command frequencies. It was basically air space coordination and radio frequency management."

Cal Fire used three incident management teams to help control the flames. Jared

Collins, helibase manager at Cal Fire's Hemet-Ryan Air Attack Base, said aerial firefighters faced a range of challenges in battling the blaze, including sleep deprivation and a loss of power and cell service across the county.

Mike Inman, a battalion chief for the L.A. County Fire Department who worked as part of the incident management team for the Northern California fires, said the fires were among the worst the state had ever seen. He said the fact that they broke in the middle of the night, catching many people unaware, likely contributed to the high number of fatalities. "It happened at nighttime and grew quickly," he said. "The fire behavior was beyond extreme, and everyone's situational awareness was lacking because it happened when people were sleeping."

At one point in October, 11,000 firefighters were battling 21 major fires across California, which ultimately scorched over 245,000 acres of land.

Even before the October fires, California had endured a heavy fire season. As of Nov. 19, Cal Fire reported a total of 6,634 fires since Jan. 1 across the state, which had burned over 505,000 acres of land. The five-year average for that timeframe is 4,677 fires and 202,000 acres, according to Cal Fire's statistics.

Towards the other end of the state, Orange County also experienced a devastating fire season, with the Canyon and Canyon 2 fires burning almost 12,000 acres between them and destroying more than 60 homes. Each fire lasted over a week, with the Canyon Fire starting on Sept. 25, and Canyon 2 beginning on Oct. 9 — just as the major fires took hold in Northern California.

"It was definitely a more severe fire season up and down the state," said Orange County Fire Authority (OCFA) battalion chief Craig Covey. "Pretty much the whole west of the United States was hammered. It was well above normal on acres burned and beyond anything we've ever experienced in homes destroyed."

Covey said pilots working on the Canyon Fire had to contend with a major set of electrical transmission lines that spanned the roadway where they were fighting the blaze. "In the smoke and at night, wires presented a huge safety concern for the pilots to be able to see — even with night vision goggles," he said. The firefighting aircraft used a helicopter coordinator to alert them of any potential dangers. "The coordinator flew low-level ahead of the aircraft to clear that airspace and identify all the wire and tower hazards," said Covey. Karim Slate, a pilot and night vision goggle instructor at OCFA, flew on both Canyon and Canyon 2 fires. "The Canyon Fire was a typical fire that started out near the [State Route] 91 freeway," he said. "There was a mild Santa Ana push, so it was spreading to the west and then in the afternoon, the wind shifted, and there was a strong onshore push about 20 knots. So then the fire reversed on itself and burnt all the way back to the city limits of Corona."

Ten aircraft worked on the Canyon Fire and 17 worked on Canyon 2, with fixed-wing aircraft, including a McDonnell Douglas DC-10, helping the effort.

"The Canyon 2 Fire occurred during 40- to 50-knot winds, which makes the stopping of the fire pretty much impossible until it gets to some sort of a natural barrier," said Slate.

Just a few miles northwest, the La Tuna Fire grabbed international headlines in early September as it became the biggest fire in the history of the city of Los Angeles. The fire began on Sept. 1, and burned more than 7,000 acres around the Verdugo Mountains over the next few days. As flames blazed around Glendale and Burbank, the city placed evacuation orders, but just five homes were lost to the fire.

"The fire wasn't that big in terms of size, but it was big for the city of Los Angeles because we don't have a huge amount of brush," said Dan Child, a pilot with the Los Angeles Fire Department. "It's not typical to get a fire like that in the city."

At one point, 12 helicopters were working on the fire, with Child splitting his time between flying a Bell 206 JetRanger and a Leonardo AW139. Working with a large number of aircraft concentrated in a relatively small area presented potential hazards. "The challenge was getting the air assets all working together and keeping them separated," he said.

Ethen Jensen was called in from the Los Angeles County Fire Department to assist with the La Tuna Fire. He said the fire was made more dangerous by a change in conditions. "The fire started on the north side of La Tuna Canyon and was headed north," he said. "As soon as the wind changed it started heading to the south side of La Tuna Canyon and towards Burbank."

While the final economic impact of this year's fire season is still unknown, it's already into the billions of dollars. In early November, Gov. Brown wrote to U.S. President Donald Trump requesting \$7.4 billion from the federal government to help Northern California recover.

Reflecting on the heavy workload the organization has faced this fire season, Cal Fire's Collins said public support has been vital. "The local communities were immensely helpful and tried to do all they could do to help out and allow us to do our job," he said. "People brought food and the appreciation they showed was superb. I even had several calls from UAV [unmanned aerial vehicle] operators offering assistance."

Cal Fire is counting on that support to help aid its vegetation management program, which calls for the public to help prevent the spread of future fires by clearing brush and other vegetation from around their houses. "It limits the amount of burnable vegetation around the home and gives us a better handle when the fire gets close to the house," said Collins.



Here, a Bell 412EP and UH-1H Super Huey belonging to Orange County Fire Authority fill up before another water drop. Skip Robinson Photo

HAC convention highlights fatigue management

BY OLIVER JOHNSON

he looming publication of new fatigue management regulations cast a large shadow at the Helicopter Association of

Canada's (HAC's) annual convention and trade show, but operators also reported optimism following a busy fire season and signs of the first shoots of growth in the mineral exploration sector.

The convention, held Nov. 9 to 11 in Ottawa, Ontario, brought together the leading figures in the Canadian rotary-wing world to discuss the major issues affecting the industry. HAC organized a range of seminars held alongside the trade show, but there was no doubting the focus of many operator's attention was fixed on those sessions discussing Transport Canada's long-running attempt to update Canada's flight and duty regulations.

Now in their eighth year of development, the proposed regulations were published in Canada Gazette I — the second to last stage of their journey into law — on July 1.

Under Canada's existing regulations, pilots can work a tour length of up to 42 days straight — with time off beforehand and afterwards. The proposals published in Canada Gazette I would reduce that to 28 days, but with a "time free from duty" requirement of five consecutive days off duty within any 28-day period, that is further reduced to 23 days.

The proposals also introduced the concept of "cumulative duty hours," with a maximum of 210 hours in 28 days, and a cumulative flight time limit of 112 hours in 28 days.

Finally, the proposed regulations would do away with the current "zeroing" provisions that reset a pilot's duty clock after consecutive days off.

The industry had 90 days to comment on the proposals, with that window closing on Sept. 29.

In HAC's annual session with the two directors general of civil aviation at Transport Canada, Aaron McCrorie and Denis Guindon, the pair said the regulator was currently going through the comments it had received and would be aiming to make a recommendation to Transport Minister Marc Garneau in early December.

They said Transport Canada is aiming to publish the final regulations in Canada Gazette II in spring 2018, which will mark the start of a phased implementation process — with Canadian Aviation Regulations (CARs) Subpart 705 operators (airlines) having one year to bring themselves into compliance, and CARs Subpart 703 and 704 operators (air taxi and commuter operators) having four years to do so.

The new regulations will not apply to private or aerial work operators (CARs Subparts 604 and 702).

Operators have baulked at the regulator's onesize-fits-all approach to the issue, bracketing all aviation — from airlines operating international scheduled flights, to ad hoc charter helicopter operations performed in remote regions — under the same standards.

In a frank exchange during the session with the directors general at the HAC convention, Corey Taylor, Universal Helicopters' VP of business development, said the regulations combined with a shortage of qualified pilots in the industry could potentially lead to more parked aircraft.

"B.C. Forestry, this year, had multiple aircraft across the spectrum firefighting, and had them parked because the crew could not fly, because of being time-maxed under the current regulations," he said. "[Under] the new regulations . . . I estimate 50/60 aircraft will be parked on a regular basis, [because there is] no one to fly them. We don't have any extra crew."

At the heart of the issue is fatigue, said McCrorie, noting that Canada had been asked by ICAO to update its regulations concerning the issue for the first time in more than 20 years.

"[In] Transport Canada's analysis of accidents over the last decade, we have seen a number of instances where fatigue could be considered a contributory factor," he said. "There's also a great societal expectation that we manage issues like pilot fit to fly more seriously, which fatigue fits into.

"There is a degradation in performance . .. and they often draw a parallel to being fatigued and being drunk. And societal expectations are not willing to allow people to operate under conditions where they are impaired, whether because they suffer from mental health issues, whether because they are on drugs or alcohol, or whether it's because they're fatigued."

The proposed regulations in Canada Gazette I also included the introduction of fatigue risk

management systems (FRMS) as an option to allow operators to bypass the prescriptive flight and duty limits — and FRMS was the subject of intense debate at HAC.

To gain an exemption from the prescriptive limits, operators must develop policies, procedures and practices to manage fatigue risk but they must demonstrate an equivalent level of safety through a "safety case" for each flight or series of flights.

Jacob Forman, CEO of Yellowhead Helicopters, highlighted the difficulty of grouping together ad hoc flights within one safety case in the boundaries established in Canada Gazette I. Would each of his company's individual heliski flights to the top of different mountains from different starting points — roughly 20,000 separate flights over the course of a winter — require their own safety case?

"It's conceivable all 20,000 flights are one safety case," said McCrorie, adding that FRMS shouldn't be considered a "get-out-of-jail-free card" for avoiding the prescribed limits.

"You've got to make a business decision about, 'Can I live with the prescriptive rules recognizing that there is a change, and a cost with that, but I can live with it? Or do I put the energy and cost into developing an FRMS so that I can manage it in a way that makes sense for me?' We've never done this in regulation. We've never built an exemption into the regulations. [And] we've done that for your benefit."

McCrorie said Transport Canada had been "committed to listening" to operators' concerns in the comments it had received from Canada Gazette I, and in separate conversations the regulator had held with operators over the summer. As part of this, he said it was considering retaining the zeroing provision for duty hours.

"We need to make sure that in retaining the zeroing provisions that we don't create a Wild West scenario, but we do create a scenario where a reasonable period of time off can zero that cumulative time and then you don't bump into those monthly limits," he said. "So, we are looking at that and we are looking at that seriously."

Next year's edition of the HAC convention in Vancouver, British Columbia — will be held Nov. 1 to 3, following feedback from operators requesting a date change to avoid the Memorial Day weekend. Give your business the lift it needs.



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Airbus bullish on 20-year sales forecast

BY THIERRY DUBOIS



irbus Helicopters reported a 27 percent increase in civil and parapublic orders in the first half of 2017, as the promise of

the market in Asia began to materialize into orders.

The uptick, measured in units, mainly comprises light models - H125, H135 and H145. The region that contributed the most was Asia.

Global sales for all helicopter manufacturers grew by three percent in the period. However, Airbus noted this should be seen as a stabilization overall. "The helicopter market began to stabilize in the first half of 2017 after seven years of erosion." said David Prevor, Airbus Helicopters' head of marketing. He said the market was "still at a low level," but is expected to recover in 2018.

Airbus is betting on some key world economies, currently "underequipped" to drive

the growth over the 2017 to 2036 period. according to a global market forecast the manufacturer released on the eve of the Helitech show in London, U.K., in October, China, India, Indonesia and Turkey, for example, combine large economies and major needs, Airbus believes. In China, the manufacturer has particular hope for growth in the emergency medical services market.

Airbus expects some €125 billion (US\$146 billion) worth of helicopters above five seats or two metric tons to be delivered over 2017 to 2036. It expects the value of the support and service business to be greater, at €245 billion (\$292 billion). Of the 22,000 helicopters delivered over that period, 50 percent will be light singles, according to Airbus.

The company also has great hopes for super medium rotorcraft. H175 sales have been slow thus far, mainly due to the trough in offshore oil-and-gas. But the super medium segment is expected to

Airbus Helicopters retains high hopes for its H175, despite relatively slow sales of the super

represent 21 percent of sales, in value, over the 2017 to 2036 period. Airbus recently ordered H175 cockpit control panels from France-based Latecoere and the numbers suggest at least 20 H175 deliveries per year over the next five years.

Sales in the energy sector will decline, partly because of the expected decrease in the world's reliance on oil. But the sector will not disappear for helicopters. Wind farms will need one helicopter per 80 turbines, Prevor said.

The global fleet is expected to grow by 50 percent from 2017 to 2036. Sales in Asia-Pacific will account for a considerable portion of the global fleet's expansion, thanks to a 157-percent growth of the fleet in the region over the period. Besides new demand in Asia-Pacific, another driver will be North American replacement needs.

Despite Airbus Helicopters' significant research and development investment in high-speed rotorcraft, the category was not factored in the forecast.



Reignwood signs for 50 more 505s

eignwood International Investment Group Company has signed a major agreement with Bell Helicopter that increases its order of 505 Jet Ranger X aircraft to 110 units, as well as naming Reignwood the exclusive reseller for the 505 in China. The Chinese company will also establish a 505 delivery and maintenance center in the country.

The wide-ranging agreement, signed in early November during U.S. President Donald Trump's trade mission to China, marked yet another highlight in a banner year for Bell in the country.

"Between Shaanxi Helicopter's order for 100 Bell 407GXPs and Reignwood's purchase agreements for 110 Bell 505s, demand for Bell helicopters in China has surged this year," said Mitch Snyder, Bell Helicopter's president and chief executive officer. "This signature solidifies our relationship with Reignwood and our commitment to develop the commercial rotorcraft industry in China."

The new contract for 50 505s follows previous purchase agreements signed earlier this year between Reignwood and Bell for 60 of the five-seat aircraft, which is powered by a single Safran Arrius 2R engine.

The 505 has a useful load of 1,500 pounds (680 kilograms), a range of 340 nautical miles (629 kilometers), and has been certified at a maximum cruise speed of 126 knots.

It features the Garmin G1000H integrated avionics suite with dual 10.4-inch (26.4-centimeter) displays, and uses the same rotor system as the 206L-4 LongRanger retaining that type's autorotational characteristics.

U.S. Secretary of Commerce Wilbur Ross witnessed the signing, which was completed by Snyder and Zheng Gang, Reignwood Aviation's chairman.

"We are pleased to have finalized this agreement with Bell Helicopter," said Gang. "We look forward to bringing the Bell 505 to customers in China and growing the use of helicopters in the corporate, tourism and utility sectors."

Even before the latest agreement, China topped the 505's sales chart by region - a trend that held true when the totals for Bell's entire civilian product line were added together. During a media conference at Helitech International in London, U.K., in October, Patrick Moulay, executive vice president of commercial sales and marketing at Bell, said this year marked the first time in the company's history that it had sold more helicopters in China than in the U.S.

"The actual China boom that we have been waiting [for] as an industry for a long time when you look at the numbers - is taking place in front of us," he said.

Reignwood has now placed two batches of orders for Bell 505s this year, for a total of 110 aircraft. Bell Helicopter Photo





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TRANSPORT CANADA CERTIFIES P&WC PT6C-67A

The AW609 is set to be certified by the FAA in 2018. **Leonardo Photo**



Pratt & Whitney Canada (P&WC) has announced that its PT6C-67A engine, which powers the Leonardo AW609 tiltrotor, has achieved certification from Transport Canada.

Federal Aviation Administration (FAA) validation of the PT6C-67A engine is expected by the end of 2017, and supports FAA certification of the AW609 in 2018 as the first commercial tiltrotor to enter operation.

"We were presented with a special challenge by Leonardo Helicopters — design an engine to power an aircraft that takes off and lands vertically, and flies horizontally well above adverse weather conditions at twice the speed and range of a helicopter," said Irene Makris, vice president of marketing, P&WC. "The PT6C-67A eloquently answers that challenge with 2,000-shaft-horsepower output that provides exceptional power to weight ratio, and durability."

DART OPENS WAREHOUSE IN AMSTERDAM

DART Aerospace has opened a new warehouse in Amsterdam, Netherlands, to offer customers in the region faster shipments, lower shipping costs, and improved aircraft on ground (AOG) support.

Steve Ghaleb, DART's vice president of commercial operations, announced the opening of the warehouse during Helitech 2017 in London, U.K., in October.

"There's been such tremendous success and so much support from our European partners and clients, as well as those from its surrounding areas," said Ghaleb.

Era rules out "broad-based" H225 offshore return



BY OLIVER JOHNSON

ffshore operator Era Helicopters has put the value of the Airbus H225s in its fleet at just \$4 million each, and said it believes

"there will not be broad-based return to service" of the type in the offshore oil-and-gas industry.

The operator made the claim as it revealed its third quarter financial results in November, in which it detailed a \$117 million non-cash impairment charge related to its fleet of nine H225s.

With the investigation ongoing into the fatal crash of a CHC-operated H225 in Norway in April 2016, and a root cause still to be identified, Era president and CEO Chris Bradshaw said the company had come to the conclusion that the H225 wouldn't return to mainstream service in the offshore industry.

"As such, we performed an impairment analysis to assess the value of these helicopters," he told financial analysts on a conference call. "It was determined that the book value of our H225 helicopters, capital parts and related inventory exceeded the fair value, and a non-cash impairment charge of \$117 million was recorded.

"The new book values represent an average of approximately \$4 million per H225 helicopter in our fleet, which is consistent with the third-party values we received in a recent appraisal report conducted by one of the leading helicopter valuation firms."

Bradshaw referenced the lawsuit Era has filed with Airbus regarding its Super Pumas — in which it alleges breaches of various contracts between the companies — but said Era was "actively marketing" the aircraft for either lease or sale.

"A potential and perhaps likely market for them are certain utility applications that require heavy-lift capacity," he said. "There's a well-established market for those type of missions that's currently being serviced by [an] older generation of the aircraft, and the 225s could be a good alternative for those missions. We also believe they may go back to work in certain search-and-rescue applications in different regions around the world."

Following the crash of the H225 in Norway, Airbus worked to develop and implement a set of protective measures for the type that were requested and validated by the European Aviation Safety Agency to ensure the Super Puma's safe return to service.

But Bradshaw said the measures were targeted at "detecting a problem once it's occured" rather than solving the underlying issue. "Nothing that's happened to date fixes the root cause," he said, adding that the operator has seen customer tenders that have excluded the H225 as eligible aircraft.

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Bristow CEO: offshore sector 'broken economically'

BY OLIVER JOHNSON

he offshore transportation market is in the midst of a "structural downturn" and requires fundamental change as it rebuilds, according to Bristow president and CEO Jonathan Baliff.

"The offshore transportation market is broken economically," he said during a panel session on the offshore oil-and-gas sector at Helitech International in London, U.K., in October. "It was built for a very different economic structure."

Baliff said the 2014 downturn in oil prices had highlighted the issue, as short-term contracts that had been held for decades were cancelled.

"Bristow, before the downturn, had onemonth contracts that didn't get cancelled for 30 years," he said. "Think about how you man a one-month contract, or you work with your OEM on a one-month contract. But it never got cancelled. And now five-year contracts, 10-year contracts [are] getting cancelled."

As the demand for aircraft isn't static, he said the structure of the offshore transportation market was more similar to the utility market, with a baseload demand, a seasonal demand, and a peak demand with each priced accordingly. "The problem is we were satisfying [the pre-2014 demand] with too many aircraft, but in a growing market, it worked," said Baliff. "[The oil companies] got the service you needed, we invested in safety, but we had too many real aircraft. If you look at the ramp of Bristow or our competitors at the weekend... we have a lot of idle aircraft."

The solution, he said, was to satisfy the baseload demand with multi-year contracts at a certain cost, and "seasonal" contracts at a different, short-term rate, to allow operators the flexibility with lessors to bring aircraft on and off.

As the industry rebuilds, Baliff said he has seen the re-emergence of short-term contracts at a higher rate that appear to cover baseload demand.

"I'd rather take less money for a longer contract that can't be cancelled and allows me to hire pilots and engineers for a longer period of time, and [who] I can train correctly," he said. "This is the way the industry should work."

He said Bristow's analysis had found that safety in offshore operations is not correlated to economic downturns, but that rapid upturns, in which operators hire new people and put in new equipment, do show some correlation.

"The key to better safety is matching the structure in a downturn/upturn," said Baliff.

"The utility industry figured this out. The question is whether our clients are willing to do it, too. I know we are. We'll sign some baseload [contracts], we'll sign some of these short-term [seasonal contracts] and get some of these short-term leases on these, and frankly this [peak demand] is probably going to have to be served in an Uber-like model, because you need instantaneous capacity sharing."

Steve Hawkes, group head of global aviation services for BP, and chairman of the International Association of Oil and Gas Producers Aviation Subcommittee, said offering longer-term contracts that would enable operators to invest in products and staff would be something oil-and-gas producers would be willing to discuss.

"I think most of us are open to [the idea]," he said. "That discussion may not go positively everywhere, but certainly some baseline production — I think that's a reasonable thing to consider."

In addition to suggesting a structural change economically, Baliff also called on the aircraft OEMs to join the operators and lessors in greater information collaboration with their competitors.

"There's very little collaboration amongst the OEMs," he said. "Especially compared to their fixed-wing peers. . . . This needs to happen. Because you can't manage what you can't measure."

Airbus developing autonomous landing system

BY THIERRY DUBOIS

A irbus He process detect a to landir

irbus Helicopters has revealed details of a new image processing system it is developing that will be able to detect a helipad and autonomously guide the helicopter to landing.

One step beyond the Rig'N Fly system that significantly reduces pilot workload in oil-and-gas rig approaches, the Eagle system has been undergoing ground tests since May, the manufacturer reported at



Helitech International in London, U.K., in October.

The system could enter into service on existing rotorcraft by the end of the decade, according to Tomasz Krysinski, Airbus Helicopters' head of research and innovation. Dubbed Eagle — short for "eye for autonomous guidance and landing extension" — the system can spot the "H" marking on a helipad. It uses a gimbaled camera unit and another two cameras on the helicopter to create a stabilized high-definition image. The "H" marking is then tracked.

A video processing unit computes "all possible metrics" on the selected target, such as relative distance, direction and elevation, Krysinski explained. The information is shown to the crew on a conventional display. In the future, Airbus is considering using the wind-shield as a giant head-up display.

As the target could be static or moving, Airbus believes Eagle paves the way for future "sense and avoid" applications. Future versions of the Eagle system will also integrate a Lidar, thus enabling obstacle detection.

The value of the Eagle system will be in coupling it with the autopilot, Krysinski added. It is therefore considered as a "technology brick" for full autonomy in urban environments, which Airbus is aiming at with its CityAirbus quadcopter.



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PHI acquires HNZ's offshore business in Pacific



Before the acquisition, HNZ operated a global fleet of over 115 helicopters to support offshore and onshore charter activities. Mike Reyno Photo

BY OLIVER JOHNSON

HI, Inc. is to acquire HNZ

Group's offshore business in New Zealand, Australia, the Philippines and Papua New

Guinea, greatly expanding the Lafayette, Louisiana-based company's international presence.

The arrangement, announced Oct. 31, will see HNZ president and CEO Don Wall purchase all HNZ's common and voting shares for C\$18.70 a share (valuing the company at C\$242.4 million), with PHI then acquiring HNZ's Pacific operations from Wall. HNZ, headquartered in Montreal, Quebec, will continue its operations in North America and Antarctica.

"This transaction provides significant value and liquidity for our shareholders, as well as continuity and opportunity for our employees," said Wall in a press release announcing the move. "I look forward to continuing the operations of the corporation in Canada, the U.S. and Antarctica, where we will continue our brand as a well-known and respected industry participant, with an excellent safety record and reputation for providing performance excellence, innovative thinking and efficient customer service."

PHI and HNZ have recent history together. In

December 2016, they announced the formation of a joint venture – PHI HNZ Australia Pty Ltd. - to service offshore facilities owned by Ichthys Project with five Sikorsky S-92s out of Broome, Western Australia. Operations on the five-year contract began on April 1, 2017.

"This acquisition is an important part of our plan to diversify our services and international footprint," said Al Gonsoulin, chairman and CEO of PHI. Inc. "It is rare to be able to acquire a segment of a company with whom you have such a strong working relationship as well as deep professional and personal regard. Together, PHI and HNZ bring a unique approach and skill to the discerning international customer. We look forward to what this will mean for our company and for those we serve."

HNZ previously operated a global fleet of over 115 helicopters to support offshore and onshore charter activities, with about 600 employees working from 36 locations around the world.

Before the acquisition, PHI had a fleet of over 230 aircraft in over 85 locations around the world, working in service to the offshore oil-and-gas industry, as well as in air medical operations, and technical service applications. The company has operated in 43 countries and employs about 2,300 people.



CITYAIRBUS DEMONSTRATOR MILESTONE



Airbus Helicopters has completed the first full-scale testing for the propulsion system of the CityAirbus demonstrator - a multi-passenger, self-piloted electric vertical take-off and landing (VTOL) vehicle designed for urban air mobility.

During the successful testing phase, the CitvAirbus team thoroughly checked the individual performance of the ducted propellers as well as the integration of the full-scale propulsion unit with two propellers, electric 100-kW Siemens motors, and all electrical systems.

"We now have a better understanding of the performance of CityAirbus's innovative electric propulsion system, which we will continue to mature through rigorous testing while beginning the assembly of the full-scale CityAirbus flight demonstrator," said Marius Bebesel, CityAirbus chief engineer.

AIRTELIS ORDERS **THREE H215s FOR AERIAL WORK**

Airtelis, with the support of Nova Capital Group, has ordered three Airbus H215 helicopters, with options for two more aircraft.

The new aircraft will complement Airtelis's existing fleet of two H225s.

A variant of the Super Puma family, the H215 will be equipped for aerial work operations in support of Airtelis's powerline construction and maintenance missions.

"We are pleased to be adding a new member of Airbus Helicopters' Super Puma family to our fleet," said Stephane Delaye, chief executive officer of Airtelis. "The H215's load capacity, cost-effectiveness and OEI [one-engine-inoperative] performance are ideal for the highly technical aerial-work missions that we perform."

Peter Murray wins Airbus Safety Award



eter Murray, founder and operations manager of Talon Helicopters, has been awarded Airbus Helicopters Canada's

2017 Innovation in Safety Award.

Murray was honored for his longstanding commitment to safety and for activities in the search-and-rescue (SAR) community, including rescues, training, and dedication to safe longline SAR operations, in which Talon has continually worked to enhance the safety of human external cargo operations.

"Safety is fundamental to everything we do at Airbus," said Romain Trapp, president of Airbus Helicopters Canada and chief operating officer of Airbus Helicopters North America. "To foster a culture of aviation safety, we must recognize those whose innovations and exceptional dedication to safe flying practices keep our industry moving forward.

"We are proud to honor Peter Murray through the presentation of this award, for his contributions toward improving safe flying practices within search-and-rescue operations."

In addition to specializing in aerial film work, utility, tour operations and electronic news-gathering, Murray ensures Talon Helicopters maintains a 24/7 SAR response position, answering the call to assist with more than 100 rescue operations annually throughout the Lower Mainland of British Colombia.

"I am honored to have been chosen to receive this award," said Murray. "I accept this award on behalf of our entire Talon team. I'm extremely proud of our crew for making safety the primary focus of all of our operations, without compromise. To lead such a tight, dynamic and professional group has been very rewarding for me. It's due to our team's absolute dedication to safety that Talon Helicopters has maintained an accident- and incident-free 20 years of flight operations."

This award is presented yearly to an individual or organization whose business initiatives have demonstrated a great impact on the overall goal of safe flying operations, including skill development, training, and committing additional resources to safety programs. The winner, determined by an award selection committee, receives a \$10,000 prize. Members of the Innovation in Safety Award selection committee include: Robert Erdos, chief experimental test pilot for the National Research Council of Canada; Fred Jones, president and chief executive officer of Helicopter Association of Canada; Matt Nicholls, editor of *Helicopters Magazine* and *Wings Magazine*; and Mike Reyno, group publisher of MHM Publishing, publishers of *Vertical, Vertical 911, Skies, RCAF Today*, and *Insight* magazines.



Peter Murray's Talon Helicopters assists with more than 100 rescues each year. Airbus Photo

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Airbus Helicopters CEO defends H225 program

BY THIERRY DUBOIS

irbus Helicopters CEO Guillaume Faury has defended the global performance of the H225 program, and claimed the situation facing the aircraft in the North Sea, where operators appear reluctant to operate the type again after an accident in April 2016, should be seen as an opportunity to raise the overall level of safety in the industry.

In an interview with *Vertical*, Faury said the program is doing well in other areas of the world and for other missions, describing those offshore oil-and-gas operators expressing a lack of confidence as "exceptions." The relationship with most operators has remained "good" since the beginning of the crisis, he said. "Our customers realize we are at their side."

H225 operations are now allowed by every civil aviation authority, and as of late September, 183 of the aircraft had returned to service. This was out of a global fleet of 346 civil and military H225s and Super Puma L2s (the two types affected by earlier main gearbox problems). "Return to service is ongoing," Faury said.

The absence of orders since April 2016 in the oil-and-gas market should be put in perspective, he said. The Sikorsky S-92 had also not received any oil-and-gas orders, he noted, as this market segment is still suffering from overcapacity. Despite this, the H225 has recorded sales in the VIP, parapublic (for the Japan Coast Guard, for instance) and military segments. "Other operators [outside of offshore oiland-gas] have a very positive view of this aircraft," Faury said. Asked whether the program could be terminated, he said, "this is not an option."

But Faury does not hide from the "major setback" the program has encountered. "I want to use the H225 accident to enhance safety and make us progress; my role is to give a meaning to all this, for more safety, new practices and new technologies," he said.

As part of this, Airbus Helicopters engineers have designed a full-flow magnetic plug, which "sees" the entire oil flow. Detection of metal particles, which may indicate spalling, is thus improved. Before the Norway crash, spalling was a



Airbus Helicopters CEO Guiillaume Faury wants to raise awareness of the company's actions following the crash of an H225 off the coast of Norway in April 2016. L. Fabre/Airbus Helicopters Photo

precursor to the failure of the main gearbox, but had gone unnoticed. Research into vibration sensing and analysis on moving gears — another way to reveal damage — is ongoing.

Moreover, engineers have gone back and checked stress analysis for every model in the product range. And, after excluding one of two types of planet gear for the H225, they similarly removed two types of planet gears for the Dauphin family.

Another precautionary measure has been with logistics, to prevent "external damage." The failed main gearbox on the accident aircraft in Norway had been involved in a road accident during transport in 2015, but the Accident Investigation Board of Norway said it found no connection with the crack. Airbus Helicopters said it has taken action to avoid such a scenario — a main gearbox suffering a road accident and then being put back into service — in the future.

The airframer has therefore enhanced its packaging. The main gearbox inside the new crate benefits from better dampening. Internal sensors monitor bank angles, temperature, hygrometry and acceleration. The last sensor thus detects shocks. A second, similar sensor is made conspicuous on an outer side of the crate, thus signaling to handlers that a shock may be traced back to them.

In a survey, Airbus Helicopters found that 60 percent of the 5,000 respondents (all in the offshore oil-and-gas sector) would be uncomfortable with flying in the H225. A second finding, however, was the majority did not know what the company had done to address the aircraft's woes.

The manufacturer therefore launched an "awareness campaign." Airbus Helicopters officials say they have maintained contact with oil-and-gas safety organizations like Step Change In Safety in the U.K. They have now transitioned to a phase of "explanation to customers." On their to-do list, they planned to meet with pilots, maintenance technicians and, ultimately, passengers.

The H225's planned successor, codenamed the X6, is still in the "concept phase." The market is volatile and "we are refining our market studies and long-term outlook," Faury explained. "We are not at the end of the feasibility study."

FAA issues NPRM for certification changes



he Federal Aviation Administration (FAA) has issued its proposals to update the certi-

fication standards for normal and transport category helicopters, noting that existing revisions to the original 1964 regulations "have not kept pace with advances in technology for rotorcraft."

The changes, detailed in a notice of proposed rulemaking (NPRM) published on Nov. 1, impact Title 14 Code of Federal Regulations part 27 (normal category) and part 29 (transport category) rotorcraft certification.

"The proposed changes are necessary due to the extensive application of advancing technologies to rotorcraft," the NPRM states. "Existing airworthiness standards are inadequate because they do not address increasing design complexity."

The FAA has three main mechanisms to help accommodate changes to technology within the current regulations: it can issue reoccurring special conditions (when the applicable airworthiness standards do not contain adequate or appropriate safety standards because of a novel or unusual design feature), equivalent level of safety (ELOS) findings (where a design does not literally comply with the airworthiness standards, but compensating factors exist that provide an equivalent level of safety), or means of compliance (MOC) issue papers (which document compliance methodologies that fall outside existing guidance and policies).

The proposed updates to the standards would eliminate the need for many special conditions, ELOS findings and MOC issue papers, the NPRM states, which would reduce the burden on applicants for certification of new rotorcraft designs — and reduce the burden on the FAA itself. Compliance with the proposed changes would continue to be shown through the same testing, analysis, and inspections as in the current certification process.

One of the proposed changes is to powerplant instruments. Current rules specify separate indicators for many engine instruments, such as manifold pressure and engine r.p.m. for piston engines; or gas producer speed, gas temperature, and torque for turbine engines. The FAA is proposing to allow means other than dedicated indicators for these instruments.

The FAA is inviting comments on the proposals before Jan. 30, 2018.



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Bristow Group sells Bristow Academy



The sale of the Bristow Academy includes the company's training facilities, helicopters, and personnel at its headquarters in Titusville, Florida, and its base in Minden, Nevada. Mike Reyno Photo

BY OLIVER JOHNSON



he Bristow Group has sold the Bristow Academy in Titusville, Florida, and Minden, Nevada, as it seeks to further streamline

its operations during what it has called a "historic" downturn in the oil-and-gas market.

As *Vertical* went to press, the company had not yet disclosed the purchaser or the price paid for the helicopter training operation, but in a news release said the sale price "will be a minimum of \$1.5 million to be received over a maximum of four years, with potential additional consideration based on Bristow Academy's financial performance."

The sale includes the Bristow Academy's entire operation, including training facilities, helicopters, and related personnel at both the Titusville headquarters and in Minden.

The move was revealed as the company announced its financial results for the three months ending Sept. 30, 2017 (the second quarter of fiscal year 2018), in which it recorded a net loss of \$31.2 million.

That compared with a net loss of \$29.7 million for the three months ending Sept. 30, 2016, and Bristow said the increase over the previous year's figure was primarily driven by higher income tax, rent, and interest expense, and a higher loss on disposal of assets.

Despite the loss, Bristow's revenues were

actually up compared to the same quarter last year — rising from \$344 million in 2016 to \$358 million in 2017. Bristow said this was due to an increase in operating revenue for its oil-and-gas services with more activity in the sector, as well as more revenue from its U.K. search-and-rescue contract as more bases came online.

"The activity level increase across our business was driven mostly by short-term contracts, ad hoc and increased flying on existing contracts, as we are beginning to see stability in certain markets, especially in the North Sea off of Norway and in the shelf in the U.S. Gulf of Mexico," the company stated in a news release. "However, these activity levels remain less predictable and may be offset by decreased activity on certain existing contracts over the second half of the fiscal year."

The operator also said it had reached an agreement with one OEM and signed a letter of understanding with another to recover about \$130 million in fiscal year 2018 "related to ongoing aircraft issues" and to defer about \$190 million of aircraft purchases into 2020 and beyond.

"Our lower cost structure is clearly showing progress, but we must continue to strive to meet the goals of Target Zero safety and our fiscal 2018 priorities as we more effectively compete and ensure our clients' success in the fourth year of this historic oil-and-gas downturn," said Jonathan Baliff, president and chief executive officer of Bristow Group.

BITS

EASA CERTIFIES H175 RIG'N FLY APPROACH



Airbus Helicopters has received European Aviation Safety Agency (EASA) certification for the Rig'N Fly system for the H175.

Already certified for the H225, the avionics upgrade enhances the H175's offshore mission capability, providing fully automatic approaches to offshore oil rigs.

Rig'N Fly uses a combination of sensors to provide enhanced flight precision and situational awareness for automatic rig approaches.

The H175's upgraded avionics suite also includes advances in the synthetic vision system — offering a better display resolution and decluttering capability — and in the helicopter terrain awareness and warning system, which optimizes crew alerting time. Approach-deviation alerts have also been improved, while enhancement of the maintenance functions and associated ground tools allow for better detection of failures and simplification of data downloading.

S-92 CERTIFIED TO OPERATE IN MEXICO

Mexico's directorate general of civil aeronautics (DGAC) has approved the offshore and utility type certificate for the Sikorsky S-92.

The certificate enables the operation of S-92s in Mexico in all production configurations, including offshore oil-andgas transportation, search-and-rescue, as well as regional airline passenger service and VIP transportation.

DGAC signed the certificate on Nov. 6, capping an intensive three-year effort from Sikorsky to secure the approval.

Sikorsky has delivered nearly 300 S-92 helicopters since 2004.



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New 'talk-through' system addresses helmet communication issues

BY ELAN HEAD



SA Gallet flight helmet dealer Merit Apparel is offering a new "talk-through" system that allows helicopter crewmembers

to communicate with patients or ground personnel without removing their helmets.

Developed in conjunction with Headsets,

Inc., the system incorporates two small microphones on the front of the helmet, which are wired to the helmet's internal speaker system for natural three-dimensional sound reproduction. This allows the wearer to clearly hear speech and other external sounds that would otherwise be muffled by the helmet.

The system is completely self-contained



and powered by one nine-volt battery mounted on the helmet, allowing it to be used both in the air and on the ground. It operates using a simple on-off and volume control knob on the helmet, and features built-in compression technology for noises above 80 decibels, so that loud external sounds don't damage the user's hearing.

According to Merit Apparel owner Rob Hamers — who debuted the system at the 2017 Air Medical Transport Conference (AMTC) in Fort Worth, Texas, in October the system is ideal for helicopter air ambulance (HAA) crewmembers, especially with many programs now requiring crewmembers to leave their helmets on during scene calls for safety reasons.

"Everyone's pushing for [crewmembers] leaving their helmets on when they're on a scene," he said. "But when they're out of the aircraft, they have no way of communicating."

With the talk-through system, he said, crewmembers can clearly communicate with their patients and people on the ground without compromising safety. For HAA applications, Merit Apparel is also offering the system with the Thinklabs electronic stethoscope, allowing crewmembers to listen to their patients' hearts and breathing with their helmets on. (The Thinklabs stethoscope can also be plugged into a cell phone or tablet for a visual reading that can be transmitted to the hospital in advance of arrival.) The system can also be used with Doppler systems, Hamers said.

He suggested that search-and-rescue and airborne law enforcement are other potential markets for the system. "It's all about safety and ease," he said. "With this, the end user is going to be able to keep doing what they need to do."

The cost for the basic system is around US\$300, with the Thinklabs stethoscope retailing for an additional \$500. The system is available for retrofit on existing helmets as well as installation on new helmets.

Because of the complexity of the installation, the work must be performed by Merit Apparel at its facility in Florida. However, Hamers said his company is aiming for turnaround times as short as 24 hours, depending on demand.
Third H160 prototype joins flight test campaign



he third H160 prototype (PT3) has performed its maiden flight at Airbus Helicopters' headquarters in Marignane, France.

PT3, with its cabin interior configuration similar to that of a serial aircraft, will contribute to certification activities and flight testing to ensure the aircraft's level of maturity ahead of entry into service in 2019.

"The third prototype incorporates a significant amount of modifications based on feedback resulting from the first two years of testing by development, production and support teams," said Bernard Fujarski, senior vice president and head of the H160 program. "It plays an essential role in delivering a mature aircraft at entry into service, and it is also closer to the serial definition with its interior lining and transport cabin configuration."

The first two prototypes have clocked more than 500 flight hours since the model's maiden flight in June 2015.



SIKORSKY LAUNCHES CUSTOMER EXPERIENCE 2.0

Sikorsky has launched its Next Generation Customer Portal for customers, aiming to provide an enhanced and more direct web-based location for all customer needs regarding maintenance and questions about their aircraft.

Owners, operators and directors of maintenance will continue to access www.sikorsky360.com via any computer or mobile tablet device. The enhanced site now integrates the Sikorsky360 content library and the former Sikorsky customer portal, allowing a single-stop to access technical content, publications and notifications. view subscription-based services, order parts, make claims, check inventory, request a quote and view historical data in a single location. Customers can also report an aircraft-on-ground event, view e-notifications, request shipments or quickly search for parts.





Composite UH-1 rotor blades ready for market



dvanced Composite Structures Florida (ACSF) has received a long-fought-for Federal Aviation Administration (FAA) exemption

allowing it to represent foreign military surplus composite main rotor blades as "suitable for installation" on restricted category UH-1 helicopters.

The exemption allows ACSF to sell the rotor

blades to restricted category operators and requires the company to issue an FAA form 8130-3 for each. It is the first time the agency has granted an exemption on foreign military surplus articles.

ACSF is now working to fulfill the obligations of the exemption, which will allow the long-awaited delivery of the composite main rotor blades to the market.



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BITS

AW169 ENTERS U.K. WIND FARM SUP-PORT MARKET

Uni-Fly A/S of Denmark has signed a contract for two Leonardo AW169s. The aircraft, due to enter service in early 2018, will perform wind farm support operations for DONG Energy at Hornsea Project One in the North Sea - 120 kilometers (75 miles) offshore from Humberside, U.K.

The order marks the first contract for the AW169 model in Denmark, as well as the first AW169s to be used to support wind farm duties in the U.K., following successful operations carried out in the North Sea for other customers in Europe.

These helicopters will feature a specially customized configuration, including a dedicated offshore interior and rescue hoist to support maintenance personnel working on the wind turbines.

STANDARDAERO COMPLETES VECTOR PURCHASE

StandardAero has finalized its acquisition of Vector Aerospace from Airbus.

Vector, a global aerospace maintenance, repair and overhaul (MRO) company, generated revenues of over US\$700 million in 2016, and employs approximately 2,200 people in 22 locations across Canada, the U.S., the U.K., France, Kenya, South Africa, Australia and Singapore.

The newly combined company, which will maintain the name of StandardAero, has more than 6.000 employees in 42 locations across five continents, with annual revenues of approximately US\$3 billion.

"We are excited to join forces with the Vector team in becoming one of the largest MRO companies in the world," said Russell Ford, chief executive officer of StandardAero.

If you would like to submit a press release or if you have a new product or service that you believe is newsworthy, please email our news editor at news@verticalmag.com.



HOLIDAY SALE! GIVE THE GIFT OF VERTICAL!

Vertical has completely redesigned and updated its Helicopter Fleet poster to include the latest next-generation models alongside in-production aircraft. This *24- x 36-inch* high-quality poster includes *76* helicopter models beautifully illustrated by renowned aviation artist Ugo Crisponi, with each aircraft featuring the distinctive livery of a civil helicopter operator. The models have been carefully arranged for easy identification by manufacturer, making the poster ideal for flight schools, hangars and offices.

A limited number of these stunning posters are available - so order yours today!



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This summer, the last of a new fleet of 15 Bell 429s and seven Bell 412EPIs arrived with the Canadian Coast Guard, bringing a successful conclusion to a swift procurement. *Vertical* visited the organization in Shearwater, Nova Scotia, to find out how the aircraft are performing in the field.

Story by Oliver Johnson | Photos by Mike Reyno

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Coast Garde

A Canadian Coast Guard Bell 412EPI holds a hover in front of a lighthouse off the coast of Halifax, Nova Scotia. The agency recently renewed its entire fleet of 22 aircraft.

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DANGER

From the Atlantic, to the Pacific, to the Arctic, Canada's coastline – the longest of any country in the world – is huge enough to border three oceans. Seven million Canadians live in coastal areas, and a good number of these are in incredibly remote and unforgiving environments. And from coast to coast to coast, the distinctive red and white helicopters of the Canadian Coast Guard exist to support these communities, and all those who live alongside, or travel across, Canada's waters.

The Coast Guard operates from nine bases strategically located across the country's coastline, as well as from icebreakers travelling across the Arctic coastline in the summer months. Unlike many other coast guard aviation units around the world, the primary role of the Canadian Coast Guard's helicopters isn't search-and-rescue (SAR) — that role falls to the Royal Canadian Air Force. The Coast Guard's helicopters can — and do — assist with SAR taskings if called upon, but they primarily serve to ensure the safety of marine traffic, largely through the construction and maintenance of navigational and communication aids that are only accessible by air.

Additional responsibilities include the support of Coast Guard icebreakers in the form of aerial reconnaissance and helping in the rotation of non-Coast Guard personnel who work on the ships; environmental response during emergencies such as an oil spill; and supporting various ongoing scientific research projects — such as the recent program to locate the Franklin expedition ships that disappeared while trying to navigate the Northwest Passage in the 1840s.

Over the last few years, the Coast Guard fleet has undergone a substantial upgrade, with 15 Bell 429s and seven Bell 412EPIs replacing the previous generation of 16 MBB Bo.105s and six Bell 212s.

"The aircraft we were flying were between 26 and 30 years old," said Sandra Howell, the Coast Guard's project manager for helicopters, who was intimately involved with the program to procure a new fleet. "The technology gap between that era and this one is significant."

A CHALLENGING PROCESS

How does an agency begin a successful large-scale procurement program? Howell said industry engagement was crucial from the outset. "We had several of the OEMs come to the table and we presented a set of preliminary requirements to them . . . based on our operational needs."

There were over a hundred of these requirements, all of which stemmed from the Coast Guard's existing operations. "For example, we fly single pilot," said Howell. "So, we needed to have an



The Coast Guard base in Shearwater, Nova Scotia, received its 412EPI in June 2017, and pilots have been quick to praise the additional capabilities it provides.



The Coast Guard recently secured permission to lift an additional 500 pounds over the previous maximum external load. **Heath Moffatt Photo**

aircraft that was certified for single pilot operations. . . . One of our other really big considerations in the requirements was the work that we do on our icebreakers."

Due the Coast Guard's work with helicopters on its icebreaking ships in the Arctic during the summer months, the new fleet needed to be able to land on those vessels, and be able to be housed in the ships' hangars.

Other considerations included fleet commonality (with pilots frequently switching between the light and medium aircraft), and a request for the aircraft to be an off-the-shelf solution rather than a new platform — and already certified for operation in Canada. "We didn't want to get into years and years of R&D [research and development]," said Howell. "[We said], 'These are the things we need to do with the helicopters — is this available [in an existing platform]? And if not, can you tell us what is available?' "

The final requirements issued in the requests for proposal (RFPs) were sculpted by industry input, with the Coast Guard taking feedback on its preliminary requirements and refining them where possible.

After the RFPs were issued, the bidding OEMs were invited to Ottawa to demonstrate the capabilities of their aircraft, with four main evaluation criteria considered: the helicopters' performance, useful load, shipboard compatibility, and vertical reference flight. The Coast Guard then submitted its evaluation report to Public Works and Government Services Canada (PWGSC) — the government agency tasked with completing the procurement. PWGSC completed a financial evaluation of the various bids and then awarded the contracts to Bell Helicopter.

However, the procurement wasn't without its challenges, with Airbus (then known as Eurocopter) protesting that the light helicopter RFP favored Bell; and Airbus, Sikorsky and Leonardo dropping out of the medium aircraft competition before the process was complete.

Howell pointed to the industry engagement throughout the process as a sign of an open competition, adding that a fairness monitor was brought in to oversee the process to review the documentation, "to make sure that we were being as fair, open, and transparent as possible so that we could maintain the competitive process."

She said the working relationship with Bell, from the awarding of the contracts to the delivery of the final aircraft, had been "phenomenal," with just four years between PWGSC issuing the first RFP — for the light helicopter fleet — to the delivery of the last of the new fleet of 22 aircraft in March 2017. Both sets of acquisitions were completed ahead of schedule.

"We've worked very hard together to make sure that not only do [they] deliver what we've asked for in the technical specifications, but that [they] delivered it on time — and on both platforms Bell exceeded their delivery timeline," said Howell.

She said there isn't any plan to use the expanded capabilities offered by the new aircraft to broaden the Coast Guard's mission — but that's not to say it won't happen in the future.

"The Coast Guard's mission and mandate hasn't changed," she said. "But we understand that we will have these helicopters for probably the next 25 to 30 years, so we wanted to ensure that we had capabilities built in to these helicopters beyond what we had to be able to expand our mission if necessary."



THE LEARNING CURVE WAS STEEP INITIALLY. THE 105 AND 212 ARE OLDER AIRCRAFT, AND GOING FROM THAT TO THE NEW TYPES . . . WAS STEEP. BUT ONCE YOU'RE TRAINED UP, IT'S QUITE A BIT EASIER TO MANAGE, AND QUITE A BIT EASIER TO FLY. - PAUL MOSHER, CANADIAN COAST GUARD PILOT

There are now 15 Bell 429s and seven 412EPIs in the Coast Guard fleet, operating from nine permanent bases, as well as from icebreakers in the Arctic during the summer months.





The East Coast's Bell 429 has been exposed to temperatures as low as -35 C (-31 F), when it visited Nain in northern Labrador in the heart of winter. Without removing the batteries or using a Tanis heater, the aircraft started after a night in the cold without a problem. **Heath Moffatt Photo**



A MANAGED TRANSITION

As mandated by the acquisition strategy, the Coast Guard's 429s and 412EPIs are fairly standard off-the-shelf models, but they do feature a few customizations to help achieve the Coast Guard's mission. Both types have a bubble door to help make the organization's vertical reference work a little easier, as well as floats and bearpaws (DART provided these kits for the Bell 412). The types also share the Garmin GTN 750/650.

The transition to the new fleet was carefully managed, with the Coast Guard developing a transition plan while the procurement process was taking place. As with the rest of the procurement strategy, this was developed in close consultation with Transport Canada's Aircraft Services Directorate, which provides the pilots and aircraft maintenance engineers (AMEs) who operate and maintain the Coast Guard helicopter fleet. The plan covered the training requirements for the pilots and AMEs, the ground support equipment and spares that would be required at each of the bases, and how the new fleet would be rolled out across the regions.

"Our goal was to put one aircraft in service and take the [older aircraft] out that same week — and put that new aircraft to work," said Howell. "So, we wanted to make sure that all of the bases were fully equipped with everything they needed to make that happen."

The pilot and AME training for the 429s took place at the Bell Training Academy in Fort Worth, Texas, and was then completed



with differences training on the Coast Guard's aircraft in Ottawa. With the 412, the Coast Guard's training instructors went to the Bell academy to complete their initial training, and then returned to Canada to develop their own training program to qualify the rest of the organization's pilots.

Most of the Coast Guard's 48 pilots have several thousand flight hours behind them, but for many of them, the step into the new fleet was the first time they'd been at the controls of the latest generation of aircraft.

"The learning curve was steep initially," said Paul Mosher, a pilot for the Coast Guard based in Shearwater, Nova Scotia. "The 105 and 212 are older aircraft, and going from that to the new types — especially the 429 with new technology from the last five or six years — was steep. But once you're trained up, it's quite a bit easier to manage, and quite a bit easier to fly."

Colin Lavallee, another pilot based in Shearwater, agreed that the new technology offered potentially huge workload and safety benefits.

"As long as you can wrap your head around all the avionics and the automation, your workload is greatly reduced and your safety margin goes up," he said. "You can use your attention to look at the terrain avoidance and traffic avoidance, for example. You can mitigate your risk."

ATLANTIC OPERATIONS

The rollout of the new fleet began on the West Coast, but the east didn't have to wait too long to get the new aircraft, with the first 429 arriving in Shearwater in February 2015, and the 412 in June 2017.

The base in Shearwater is one of five in the Atlantic region (along with St. John's, Newfoundland; Stephenville, Newfoundland; Charlottetown, Prince Edward Island; and Saint John, New Brunswick). From those bases, the Coast Guard operates a total of nine helicopters — seven 429s and two 412s. Two of those nine spend each summer aboard an icebreaker in the Arctic.

"On the East Coast, we do a lot of flying for construction programs," said Paul Veber, superintendent of the regional operations center for the Atlantic region. "The Coast Guard's always constructing helicopter landing pads, light stations, [and] fixed shore aids to navigation, so our helicopters sling towers, they sling a load of cement, and they're versatile in the sense that they can do the construction work from land, but they often do the construction work from shipboard platforms."

In addition to the aerial construction work, which requires a high level of skill from pilots with the long line, the helicopters transport Coast Guard technicians to the various navigational aids to perform maintenance or checks, and during the winter months, they perform

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The Coast Guard's aircraft are primarily used to construct and maintain navigational and communication aids to ensure the safety of marine traffic. They can also assist with search-and-rescue missions if called upon.

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es The 412 is the heavy-lifter of the Coast Guard's fleet. Ninety ts. percent of its work on the East Coast is aerial construction.

Due to the new technology in the airframes, the Coast Guard's maintenance crews have had to adapt to a different style of maintenance. However, Paul Veber, superintendent of the regional operations center for the Atlantic region, said the aircraft's reliability has been great. **Heath Moffatt Photo**



The Coast Guard's 429s and 412EPIs all have bubble doors. The bubble door on the 412 was praised by the pilots, who said it provided a much improved window of visibility over the 212. **Heath Moffatt Photo**



aerial reconnaissance on the ice floes off Canada's East Coast.

"Because of the amount of ice we have here in the winter months, we're trying to provide the most accurate, up-to-date and timely ice information for own our ships and commercial ships," said Veber. "For that, we're reliant on the helicopters in our fleet."

Veber said he is receiving overwhelmingly positive feedback on the new fleet from across the Atlantic region — both from his crews and the clients using the machines. The speed of the new aircraft in particular, he said, was greatly enhancing the Coast Guard's capabilities.

"The 429s are much quicker, they cover a lot more ground in the same period of time than the old 105s did," he said. "Even the new 412s have an increased speed over the 212s. We cover a large geographic region — for instance, from St. John's to southern Labrador was always a two-day trip. Now we can do that and return in a day because of the increased speed of the machine. . . . It's really improved the efficiency, the speed, and the range at which we're able to conduct our programs on a day-to-day basis."

The maintenance crews — after having to adapt to a very different style of maintenance with the technology on the latest generation of aircraft — have also been pleased with the aircraft's performance. "Those machines fly a lot of hours, do an



Pilots have praised the 429's single-engine performance. Heath Moffatt Photo





awful lot of slinging, and carry heavy loads — and the reliability has been great," said Veber.

THE FLEET TAKES FLIGHT

In Canada, the 429 has a maximum gross weight of 7,500 pounds (3.400 kilograms), offering a payload of roughly 2,300 lb. (1,040 kg), said Mosher. Shortly before *Vertical's* visit to Shearwater, the Coast Guard had secured an extension on the 429 for a maximum gross takeoff weight (external) of 8,000 lb. (3,630 kg).

"It's an extra 500 lb. [225 kg], which the aircraft is more than capable of — they have lots of power," said Mosher.

Despite this, the 412 is still considered the workhorse of the new fleet. "It's the heavy-lifter," said Mosher. "Ninety percent of our work with the 412 is aerial construction, so we're doing a lot of the lifting that the 429 can't." And it's the aerial construction work that is particularly appealing to many of the Coast Guard's pilots. "Vertical reference is probably one of the more enjoyable things that we do, just simply because of the challenge," said Lavallee. "Most of us have got thousands of hours, so flying from point A to point B is kind of mundane. Getting out and throwing the line on and doing a bit of vertical reference work, whether it's shore-based or ship-based — it's a challenge."

A bonus with the 412 — as compared to the 212 — is the ability to use it as a shipboard platform. According to Veber, the skids on the 212 weren't rated for use in a sea condition, whereas the 412 complete with a blade folding kit — is more than ready to operate from the Coast Guard's icebreakers.

"The old 212s might pitch down on the flight deck just to fuel, but they'd have to go again," he said. "The 412s can actually be based on board the ship, which gives us a great deal more versatility in that area."

The Coast Guard's icebreakers required some modifications to accommodate the new fleet — primarily to the hangars on board. Aside from some teething issues with the 429's blade folding kit, the new fleet's transition to shipboard operations has been quite smooth, said Lavallee. The 429's impact has been particularly evident during crew changes, he added, when its ability to carry six or seven — as compared to the three that would typically be taken on the 105 — has meant that a crew change can be completed in a fraction of the time previously taken.

According to the Coast Guard pilots in Shearwater, the quickly changing weather — and its potential to bring fog — is the greatest challenge they face in their operations. Thankfully, there's never any pressure for the crews to push the boundaries of safe operations to complete a tasking.

"Our organization leans heavily towards safety," said Mosher. "If we're out doing the job and we feel that the job can't safely get done, we can postpone it, or change it, or delay it. And we don't get any

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pushback from that [from superiors]. . . . There's not that pressure there of, 'You have to get this done today.' "

Lavallee said the new aircraft haven't changed the Coast Guard's role, just made it easier and safer to do the job.

"The aircraft lift a little more [than the previous generation], are more automated, [and] are safer to operate," he said. "It makes it easier for the pilots to do our jobs. Our existing fleet was an older fleet, and was starting to cost a lot of money to maintain. Our timing was pretty good to transition."

With regards to the 429, Lavallee highlighted the aircraft's singleengine performance. "It's phenomenal, in comparison to where we were," he said. "We follow the Category A envelope, which, for us, is a huge safety margin built in that we didn't have before.

"We went from an aircraft that, to do our jobs, we were on the borderline of max power all the time doing certain taskings. Now with the 429, with that 7,500 lb. internal [maximum gross weight], we've got a 25-percent power margin. Of all the different types I've flown, I've never seen, ever, a 25-percent power margin left. It's huge."

A MULTI-USE SIMULATOR

A third strand of the Coast Guard's fleet renewal program is the acquisition of a full flight simulator, with CAE awarded the contract for a Level D device to support both the 429 and 412EPI in February 2016.

The simulator — a CAE 3000 Series — features a roll-on/roll-off cockpit design, allowing it to represent both types used by the Coast Guard. When one cockpit is inside the full flight simulator, the other will sit on a docking station that allows it to be used as a Level 5 flight training device.

Pilots using the simulator will be able to train in extremely familiar environments, with many of their operating areas and mission profiles built into the machine.

"We have 36 operational training areas that we'll be able to go into and train for the types of operations that we actually do," said Howell. "We'll be able to land onboard the back of an icebreaker on the west, east, and central Arctic areas in which we currently operate; it's very specific to our operations. One of the biggest benefits for us is, of course, not only de-risking pilots and our aircraft, but not having to take the aircraft off a program to actually do training."

The simulator is set to be delivered to the Coast Guard in 2018, and as *Vertical* went to press, was completing verification of validation.

The simulator represents the last piece of the Coast Guard's fleet renewal program, and once it is in place, it will mark a successful conclusion to a program that was highly ambitious both in time and sheer scale. Government procurement programs aren't typically associated with speed and ease of integration, but with a fleet of 22 aircraft and a simulator going from concept to operation in just over five years, the Coast Guard's fleet renewal seems to have bucked the trend — and brought an exciting new generation of aircraft to support those living and working along Canada's coasts.



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_



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Epic Helicopters operates out of a new 30,000-square-foot facility on the west side of Fort Worth Meacham International Airport in Texas — where it has plenty of room for future growth.

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Epic Helicopters in Fort Worth, Texas, is taking a new approach to flight training — and keeping an open mind about the industry's future. Story by Elan Head | Photos by Will Graham

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Epic regularly partners with brands and professional photographers on special photo shoots and promotions.

For anyone learning how to fly, soloing an aircraft is an unforgettable milestone. For most students, it's also a critical gate in their training — a box that must be ticked before they can proceed to instruction in cross-country flight or advanced maneuvers. Should it be?

Most students master basic aircraft control long before they're proficient in emergency procedures. That means a student who solos with low hours is unlikely to be prepared for an in-flight emergency. But delaying a student's progress out of an abundance of caution can be rough on that student's pocketbook and morale — and even very talented students can have their training stalled by weather that's not quite good enough for solo flight.

Epic Helicopters, of Fort Worth, Texas, has taken a different approach to soloing its students, sending them up for their first solos towards the end of their private pilot training, rather than the beginning. "We asked ourselves, what makes sense as a learning process to make it easier for the student?" explained Michael Hume, Epic's flight academy manager. Not only does moving the solo milestone help students avoid unnecessary delays, by the time they do solo, "now they're more knowledgeable, safe pilots," Hume said.



This is just one of the ways in which Epic is rethinking helicopter flight training as it works to create skilled professional pilots who are also satisfied customers. "We have put together a program that we think is going to train students more efficiently," said president and director of operations Brian Dunaway, adding, "When [employers] see Epic on the resume, we want them to be put at the front of the line."

The company is forward-thinking in other aspects of its operations, too, embracing social media and partnerships with outside companies like Uber. With a brand-new facility in "one of the greatest aviation markets in the U.S." — home to manufacturers including Bell Helicopter and Airbus Helicopters Inc., among others — Epic is "definitely an exciting place to be right now," said Dunaway.

BUILT FROM THE GROUND UP

Epic is an authorized Robinson service center.

Dunaway, now 37, got an early start in aviation. He made his own first solo flight on his 16th birthday, and earned his commercial pilot certificate at age 18. Although he started his flight training in airplanes, he quickly fell in love with helicopters, which became his focus.



Rather than pursue a career as a pilot, however, Dunaway opted to study business at Elon University in North Carolina. From there, he went into marketing, taking a position with a small advertising firm in Dallas.

But aviation was never far from his mind — and, as someone who comes from a family of entrepreneurs, neither was being his own boss. Dunaway began writing his business plan for Epic Helicopters while he was still working in marketing and advertising. He also started training to become a certificated flight instructor (CFI), using the opportunity to tour a number of different flight schools and gain perspective on the business.

Dunaway launched Epic Helicopters with one Robinson R22 in 2006. Although he initially envisioned Epic as an aerial photography company, he discovered there was significant demand for flight training, too. Today, training accounts for 50 to 60 percent of the company's business, with the rest split between charter operations and tour flights.

From the beginning, Dunaway believed he could offer the market something better than the status quo. As the company has grown, he has moved steadily toward realizing that vision. Several years ago, he hired well-known flight instructor Randy Rowles — the 2013 recipient of Helicopter Association International's W.A. (Dub) Blessing Certified Flight Instructor of the Year Award — as Epic's director of training. Rowles, in turn, alerted Hume to a CFI job opening at Epic; the two had met when Hume was still a student at Embry-Riddle Aeronautical University in Arizona.

Two-and-a-half years ago, with the flight school growing, Rowles and Hume sat down to rethink Epic's Federal Aviation Administration (FAA)-approved part 141 training program, which had originally been approved in 2009 (the same year Epic obtained approval to train non-U.S. citizens). According to Hume, they realized that they could either "create courses to fill the gaps, or create something from the ground up." They chose the latter option, in the process questioning some conventional wisdom about flight training — such as the appropriate timing of a student pilot's first solo. They also revised Epic's instrument training program to place more emphasis on cross-country flight and operating within the instrument flight rules (IFR) system.

Their most extensive changes, however, were to Epic's commercial pilot training program. Not only did they want to address the weaknesses that Rowles had observed in his role as an FAA designated pilot examiner, they wanted to better prepare students for



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- MICHAEL HUME, EPIC FLIGHT ACADEMY MANAGER



the reality of commercial helicopter operations. As Hume noted, "A lot of stuff that people do in the commercial world isn't taught in flight schools."

The result was a series of five- to 10-hour "elective courses" that commercial students can use to build hours towards the FAA's minimum flight time requirements — rather than simply boring holes in the sky, as many commercial students do. These elective training blocks provide students with more focused instruction in subject areas such as high-density airspace operations (taking advantage of the Dallas-Fort Worth area's busy local airspace), flying in the wire environment, night vision goggle (NVG) use, and external load operations, all relevant to the real world of commercial helicopter flight.

According to Hume, Epic helps students tailor their training towards specific aspirational goals. For example, students who hope to one day become helicopter emergency medical services



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(HEMS) pilots might combine courses in high-density airspace, off-airport landings, and crew resource management. These 150hour pilots won't be ready to fly HEMS anytime soon, but they will have a strong foundation from which to further develop skills that will benefit them in their later careers.

"We're looking for pilots who come out of our academy to be safety-minded, competent, and confident," said Hume. "They're confident in their abilities, and they're confident in what they can and cannot do."

"I really love what we're doing here," said Rowles, explaining that Epic's approach to flight training is not so much recreating the wheel as "redesigning the flow of the spokes." By involving the FAA in the process early on, he said, Epic was able to shorten the time required for the agency's approval, which came in February of 2017. Since then, Rowles and Hume have focused on standardizing courseware and training Epic's six current instructors to administer it in a standard way, ensuring that all students reap the benefits of the new curriculum.

For the same reason, Epic has invested extra effort in its CFI training program. "We have an excellent CFI program because it is founded on closely mentoring candidates, putting them in actual teaching exercises, and using group collaboration and learning," said Dunaway. "Our CFI flight training program is organized, methodical, and thoughtful. We take the CFI program very seriously and work hard to develop these candidates."

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READY FOR THE FUTURE

Dunaway said he couldn't be happier with Epic's new part 141 training program and how it came to fruition: "I've probably not seen the cards fall into place as smoothly and sequentially as they did with this project." Moreover, he said, "I feel really confident about who we have in place in key positions."

As Epic moves into its second decade of operations, one other thing bodes well for its success — its new 30,000-square-foot facility on the west side of Fort Worth Meacham International Airport, of which 14,000 square feet are dedicated to classrooms and training. The facility was designed by Dunaway and his team to meet Epic's specific needs, and opened in 2016. Not only does the stylish modern building project a professional image to customers, it is spacious enough to accommodate future growth. Said Dunaway, "Without this facility, we couldn't do what we want to do."

And there's plenty that Dunaway and his team want to do. On the flight-training side, Epic — which currently operates a fleet of two Robinson R66, four R44, and two R22 helicopters, plus a newly added Bell 407 in association with Helicopter Institute plans to launch a fixed-wing training program in January 2018. The company is also looking to upgrade its existing Flylt flight training device. "We're excited about the possibilities of a better, higher-fidelity simulator," said Dunaway.

> As the 16th largest city in the U.S., Fort Worth offers plenty of attractions to keep students busy when they're not flying. The Dallas-Fort Worth airport hub also offers easy access for international students.



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Epic's facility is adjacent to the 24-hour control tower at Fort Worth Meacham Airport, providing students with opportunities to learn more about air traffic control.

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Meanwhile, Rowles will be offering initial and recurrent training at the facility in the Bell 407, including NVG training. The addition of the more capable 407 will also allow Epic to take on local external load work, as the company was recently granted FAA approval for part 133 rotorcraft external load operations. And, at the end of November, the company had its training programs approved by the U.S. Department of Veterans Affairs (VA).

Epic will also be taking advantage of its new space to host FAA Safety Team meetings and other outreach efforts. in the summer of 2017, for example, the company put on a Helicopter Adventure Camp for kids aged 12 to 18, featuring a simulator lesson, flight in a helicopter, and visit to the adjacent Fort Worth Meacham control tower.

"I'm so excited about the prospect of some of these things," said Dunaway, adding that the company re-launched its website in 2017 to better reflect its current identity and offerings.

As for the company's long-term future, who knows what it might bring? As a regular partner with Uber on "UberChopper" transport for special events, Epic is closely following the ride-share company's Elevate program, which aims to bring electric vertical takeoff and landing (eVTOL) aircraft to Dallas-Fort Worth skies in the next five years. Although many people in the helicopter industry are skeptical of Uber's ambitious timeline, Dunaway is approaching the concept with an open mind - as he has with so many other aspects of his business.

"I really think it's going to be: get on board or get left behind," he said. 📩

Elan Head | An award-winning journalist, Elan is also an FAA Gold Seal flight instructor with helicopter and instrument helicopter ratings, and has held commercial 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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Facing often inclement weather conditions on the rugged coastline of the Pacific Northwest, the demands of U.S. Coast Guard Air Station Port Angeles mean it has become a competitive first station among USCG pilot graduates.

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Story & Photos by Skip Robinson

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Located on the tip of a three-mile-long sandspit in the Strait of Juan de Fuca, just a few miles south of the Canadian border in the Pacific Northwest, U.S. Coast Guard Air Station Port Angeles is responsible for an unusually broad range of missions. Not only do air station personnel conduct normal Coast Guard search-and-rescue (SAR) work, coastal law enforcement operations, and fisheries patrols, they also have responsibilities related to border enforcement, interdiction, and homeland security. Additionally, they perform mountain rescues in nearby Olympic National Park in support of the National Park Service and local rescue agencies.

Now distinguished as the U.S. Coast Guard's oldest continuously operating air station, Air Station Port Angeles was commissioned on June 1, 1935, becoming the first permanent Coast Guard Air Station on the Pacific Coast. In September 1944, the station officially became Coast Guard Group Port Angeles, operating various fixed-wing multi-mission aircraft (the last of which was the Grumman HU-16E Albatross seaplane, finally retired in 1973).

Port Angeles' first helicopter arrived in 1946, a piston-engine Sikorsky HO3S-1G that had little capability, but served to train crews in rotary-wing flight. Five years later, a much more capable Sikorsky HO4S (a variant of the civil S-55) arrived, providing the ability to hoist multiple people into its cabin.

In 1965, the station leaped forward to the turbine-powered and amphibious Sikorsky HH-52A Seaguard. The long-lived, reliable and much-loved Seaguard flew for decades and rescued countless people from the frigid coastal waters. In 1988, the Aérospatiale (now Airbus Helicopters) HH-65A Dolphin twin turbine arrived in Port Angeles, along with its advanced SAR avionics suite. "

CGAS PORT ANGELES OPERATES IN THREE DISTINCT REGIONS. THESE INCLUDE THE RUGGED AND SECLUDED COASTAL AREA, THE HEAVILY POPULATED SEATTLE/ TACOMA AREA, AND THE SAN JUAN ISLANDS. A crew practices a rescue mission over the Olympic Mountains. The unit has completed rescues with the Dolphin at over 6,000 feet above sea level.



The re-engined HH-65C arrived in July 2007, marking a significant improvement in aircraft capability and emergency single-engine flight performance. Shortly afterward, in May 2008, the HH-65C was replaced by the multi-mission MH-65C, with an upgraded avionics suite, and the ability to mount weapons for the Coast Guard's Airborne Use of Force (AUF) mission. In June 2012, the air station upgraded to the most recent version of the Dolphin, the MH-65D, and currently operates three of the model.

Meanwhile, in June 2010, Coast Guard Group Seattle and Group Port Angeles merged, creating Sector Puget Sound and Coast Guard Air Station/Sector Field Office (CGAS/SFO) Port Angeles. CGAS/SFO Port Angeles has logistical and administrative oversight The base's cavernous hangar keeps the aircraft dry during the wet winter months.



over four 87-foot (26-meter) patrol cutters, one 110-foot (22-meter) patrol cutter and three small boat stations.

A CHALLENGING ENVIRONMENT

CGAS Port Angeles operates in three distinct regions, known as areas of responsibility (AORs), covering 3,500 square miles (about 9,000 square kilometers). These include the rugged and secluded coastal area (western AOR), the heavily populated Seattle/Tacoma area (southern AOR) and the San Juan Islands (northern AOR).

Together, the areas encompass Washington's northwestern coast, including the Strait of Juan de Fuca, the Olympic Mountains, and





Puget Sound. Within the AORs are a large number of transiting commercial ships and navy vessels of all types and sizes. Washington state is also a haven for private power boats, sailing boats, and kayaks, and is second only to Florida in the number of boats registered per capita. With marine activity taking place around the clock, CGAS Port Angeles receives a steady stream of calls for assistance with its cutters, small boats, and helicopters.

The operating environment is a challenging one. Due to CGAS Port Angeles' location on a small peninsula offshore, temperature differentials during the summer months create low-level advection fog that covers the air station. Because the fog layer typically extends only 100 to 200 feet (30 to 60 meters) above ground, the station operates under a waiver during the summer that allows crews to launch below standard weather minimums to conduct routine patrol flights.

More challenging weather arrives during late fall and winter, and often persists through the spring. From October through as late as June the area can endure long rainstorms and fog patterns. There are also distinct microclimates within the air station's three regions; for example, there can be extreme turbulence in the Everett Area as winds wrap around the Olympic Mountains and then collide in the skies above.

There is also strong onshore flow, with winds routinely in excess of 25 knots, and a marine push with dense fog. Offshore can be even worse, with 50-knot winds, 20- to 30-foot (six- to nine-meter) seas and rain cells with rapidly developing fog. With these conditions, icing is a major concern, and because the MH-65D is not equipped for de-icing, crews regularly practice low-level flight under special visual flight rules (VFR).

The Pacific Northwest's diverse microclimates and constantly changing weather mean that a calm, sunny day in Port Angeles could be a wet, windy day in Seattle. Preflight weather planning plays a significant role in executing SAR cases, and flight crews must continually re-evaluate weather conditions in flight. Meanwhile, flying west of Port Angeles presents its own challenges, as airports and aviation fuel are scarce. Although the air station has established two fuel caches to extend its helicopters' range and endurance, access to them can be limited in poor weather, so fuel planning becomes critical.

Flight crews have time pressures to contend with as well. For victims in the water, the cold ocean temperatures translate to the rapid onset of hypothermia and short survival times. For ocean SAR cases, or even wet-weather cliff rescues, time is of the essence to bring a victim to safety.

CONTINUOUS TRAINING

Because of these demanding operating conditions, Port Angeles is a competitive first-tour destination for new Coast Guard helicopter aviators coming out of flight school. Consequently, a large percentage of flight hours are spent on continued training for these new pilots. Port Angeles' challenging AOR exposes rookie pilots to a variety of situations, helping to develop them into well-rounded and competent aviators. In addition to flying in diverse environmental conditions, Port Angeles flight crews also get practice navigating a range of airspace types, from Class B airspace to military operating areas, as well as Canadian airspace.

Flight mechanics (hoist operators) and rescue swimmers come to Port Angeles from other air stations or direct from their schoolhouses. Rescue swimmers at Port Angeles must contend with very cold water, cold air temperatures, strong winds, and rough ocean conditions — all of which challenge their ability to stay mentally and physically focused during a rescue operation. Add in low visibility, rough seas, and fuel concerns, and hoist operations can quickly become extremely challenging for everyone involved.

CGAS Port Angeles trains hoisting with different small boat stations and a variety of Coast Guard surface vessels, including 45-foot (13meter) small boats, 47-foot (14-meter) surf boats, 64-foot (20-meter)

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patrol boats, and 87-foot (26-meter) cutters. Training is done in controlled calm waterways and in the open ocean, where wave actions and winds make it much more challenging. The waters off Washington state regularly see 20- to 30-foot (six- to nine-meter) swells in the wintertime, and to prepare for emergencies during these conditions, the air station conducts "high sea hoisting" training flights with small boat stations. Through regulation, Coast Guard training scenarios are restricted to 15-foot (4.5-meter) seas, but even with this limitation, dangerous situations can develop if proper flying techniques are not maintained.

To give flight crews additional resources, some attend the Coast Guard's twice-yearly Advanced Helicopter Rescue School near U.S. Coast Guard Air Station Astoria, Oregon. The school gives crews training and procedures for particularly difficult operations, and then these techniques are passed down to newer duty pilots.

USCG Port Angeles crews also train regularly for vertical surface (cliff-side) rescue operations, as well as mountain rescues in neighboring Olympic National Park. From sea level in Port Angeles, the Olympic Mountains rise to elevations of nearly 8,000 feet (2,440 meters), and with the MH-65D being a main gearbox torque-limited aircraft, hoisting at these altitudes demands considerable skill, as well as precise crew coordination.

Selected USCG Port Angeles pilots undergo specialized training at the U.S. Army's High Altitude Aviation Training Site (HAATS) in Colorado, where they learn advanced power management techniques. The air station also conducts regular training with Olympic National Park rangers and rescue teams, giving everyone involved the opportunity to coordinate on rescue procedures, communications, equipment utilization, and asset capabilities. The air station's crews typically respond to multiple mountain SAR cases throughout the year, with most of these during the summer months. In one instance, an MH-65D crew hoisted an injured climber from an elevation of 6,300 feet (1,920 meters) in the Olympics. This was not only the highest altitude helicopter rescue accomplished in the mountain range, but also the highest altitude MH-65 Dolphin rescue to date. To accomplish this mission, the flight crew conducted extensive pre-flight planning and removed excess weight from the helicopter, while also carrying a minimum fuel load.

COOPERATIVE RELATIONSHIPS

Normally, USCG Port Angeles is assigned two 40-day helicopter cutter deployments a year, sometimes as far away as East Asia, the polar regions, and the Caribbean. Typically, these deployments are on 210-foot (64-meter) medium-endurance cutters, but they can also be on larger ships. To maintain their readiness for deployment, Port Angeles pilots are required to maintain deck landing qualifications and work with a variety of vessels, from the 210-foot cutters to 378-foot (115-meter) high-endurance cutters, 418-foot (127-meter) national security cutters, and the Coast Guard's Polar Star icebreaker. Flight crews also work with U.S. Navy ships of all types, plus Canadian Navy and Coast Guard vessels.

Port Angeles' proximity to the Canadian border provides air station crews with the opportunity to train alongside Canadian military assets, including the Royal Canadian Air Force's Leonardo CH-149 Cormorant rescue helicopters and the Royal Canadian Navy's Sikorsky CH-124 Sea Kings. The air station also cooperates with the



Canadian Coast Guard and Royal Canadian Mounted Police for law enforcement, ferry systems, border patrol flights, and SAR missions.

Another form of international cooperation can be found in the Shiprider program, officially known as Integrated Cross-Border Maritime Law Enforcement Operations (ICMLEO). Shiprider involves Canadian and U.S. Coast Guard patrol boats and cutters crewed jointly by specially trained and designated Canadian and U.S. law enforcement officers. These officers are authorized to enforce the law on both sides of the international border to prevent smuggling and human and material trafficking.

Whether through such international relationships, or its close ties to local first responders, cooperative relationships play a large role in CGAS Port Angeles' success.

"Our operational success is facilitated through rigorous flight training," explained Capt. Mark Hiigel, the air station's commanding officer. "The most important element to overall unit success is understanding that even though our helicopters are the most visible part of our operations, it's made possible through a robust network of support staff and close ties with our local, state, federal, tribal, and international agencies.

"The men and woman of CGAS/SFO Port Angeles have proven themselves many times over and have accomplished many rescue missions in treacherous conditions that without their dedication would have cost innocent people in danger, their lives."



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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קרובאיבורו*ה ביר*בי

CanWest Aerospace tries to create a family-like atmosphere, with essential contributions from the Jackson family. Pictured are Declan and Killian (center), their grandfather Ron (left), and father, Tom. **CanWest Photo** CANWEST AEROSPACE

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COMPANY PROFIL


test a Bell 212 r.p.m. box. Charles Vowles Photo

CanWest offers a range of support for all types of aircraft, including the S-76. **Charles Vowles Photo**

CanWest Aerospace, a leading maintenance, repair, and overhaul company, takes an old-school approach to business, viewing employees as its most important asset.

By Ben Forrest

Tom Jackson does not remember exactly when he began tagging along with his father Ron, an aircraft mechanic for Okanagan Helicopters and later Canadian Helicopter Corporation, in the picturesque city of Fort St. John, British Columbia.

But Jackson was so young at the time that his memories do not go back much further. He grew up in and around the Okanagan hangar, playing with nuts and bolts and later spending his summers in fire camps, washing and waxing Bell 204 and 205 helicopters. As he worked, Jackson soaked in a corporate culture that struck him as the way to run a business - one that was family-oriented, focused on people, and where camaraderie was high.

It was exactly the kind of environment he wanted to replicate years later, when he created CanWest Aerospace, an elite maintenance, repair, and overhaul (MRO) firm based in Langley, British Columbia, about 28 miles (45 kilometers) southeast of Vancouver.

"I take that exact same business model and run it here, because it's all I know," said Jackson, a trained aircraft maintenance engineer who now serves as president and director of maintenance for CanWest Aerospace. "Everybody was one big family. They worked, they played, they hung out together. Their social network was the people they worked with."

Jackson worked for about five years at CHC Helicopter, the

company that formed in 1987 after the merger of Okanagan, Toronto Helicopters, and Sealand Helicopters. He also spent time at Alpine Helicopters in Western Canada and worked as a private contractor in Central and South America, with stints at his father's company, RTD Helicopter Support, and at Maxcraft Avionics, sprinkled in.

"I've been in the industry for so long now that I noticed that it changed," he said. "We lost that family kind of thing. . . . Contractors and seasonal workers would come in and out, and people didn't stay at one company for a long-term period. So, a lot of my people that work for me are long-term employees. They buy into the dream and the passion. And when they buy into that, then that transfers into the quality of work that you deliver to your customer on the MRO side."

CanWest Aerospace traces its origins back to CanAm Components, a component overhaul business specializing in cargo hooks and aircraft accessories that Jackson started in a 350-square-foot space in a Langley industrial park in 2004. The company was initially part of CanAm Aerospace Group, and Jackson was its only employee. Within three months he hired a second worker, and the company grew quickly from there. It separated from CanAm Aerospace Group in 2006, re-branded

COMPANY PROFILE CP CANWEST AEROSPACE



Aircraft maintenance engineer Tessa Ferneyhough works on a Sikorsky S-76. Charles Vowles Photo



Tom Jackson and his son Killian work on a Sikorsky S-61 N helicopter. **CanWest Photo**



nents manager, works away in the shop. Charles Vowles Photo

as CanWest Components, and began buying up smaller companies that expanded its reach and scope of operations.

CanWest acquired River's Edge Avionics in 2008 and bought its first hangar at Langley Regional Airport from Tundra Helicopters in 2009. The company increased its capabilities in dynamic components, hydraulics, pneumatics and wheels, and bought the assets of Precision Aero Instruments in 2011. Jackson decided to combine all three companies into one, and they became CanWest Aerospace in 2013. Growth continued with the acquisition of G Direct Aviation (formerly known as Nivens Aviation) in 2015.

Today, CanWest Aerospace is one of North America's premier independent MRO companies, supporting helicopter and fixed-wing customers around the world. Operating out of three buildings with about 18,000 square feet at Langley Regional Airport, the company has more than 40 employees, and is a Transport Canada and European Aviation Safety Agency (EASA) approved MRO provider with ISO AS9100D certification.

CanWest Aerospace offers comprehensive support to many of the



Ron Jackson stands with an Okanagan S-61 helicopter. Ron was an Okanagan employee who often brought his son Tom with him to work, inspiring a lifelong passion for aviation. **CanWest Photo**



Ron Jackson stands with a Royal Canadian Air Force CH-124 Sea King helicopter. CanWest Photo

most common light, medium and heavy helicopters, including the Sikorsky S-61 series, S-76, S-64, S-70, UH-60, UH-3H, SH-3D and CH-124; the Airbus Helicopters AS350, EC120 and Bo.105; the MD Helicopters MD 500; the Leonardo AW139; and the Bell Helicopter 206, 206L, 204, 205, 212, 214, 407, 412, CH-146 and UH series.

CanWest's component MRO business offers support for everything from dynamic components like main and tail rotor drivetrains to electrical components, parts and assemblies like caution panels and search and landing lights. The company also repairs and overhauls flight controls, fuel systems, hydraulic and pneumatic components and systems, as well as landing gear components and magnetos. It also provides mechanical support services and continues to offer support for cargo hooks, wheels and brakes.

CanWest also has extensive repair, overhaul and field maintenance capabilities for airframes, offering full sheet metal, metal fabrication and composite services at its Langley facility or wherever operators are stationed around the world. Its customers include utility, offshore and aeromedical operators, as well as military and government agencies.

The company sees its avionics team as one of the best in the business, supported by some of the aviation industry's leading original equipment manufacturers (OEMs) and distributors. Its comprehensive support includes troubleshooting and repair, new system installations and legacy integrations, avionics system upgrades, re-certifications and many other services.

Other key offerings include the company's instrument repair and overhaul services, covering everything from tachometers and temperature indicators, to compasses and gyroscopic instruments. Rounding out its capabilities are CanWest's wide range of fabrication and repair services for doors and cowlings, airstair doors, windows, platforms, elevators, intake plenums, firewalls, vertical and horizontal stabilizers, and panel reconstruction.

With such a wide range of services, CanWest believes it can refur-



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"We pride ourselves [on] being legacy aircraft experts," said Jackson. "As newer aircraft come off the production line, the focus on the OEMs is just supporting those newer aircraft."

CanWest fills an essential niche, but it often runs into obsolescence issues, creating the need to either come up with new processes for repairs or manufacture new parts.

"As a small company we're able to take on projects like that, that the OEMs may not have any interest in, because it's an old, legacy aircraft," said Jackson. "Their focus is on producing new aircraft and maintaining the current issues with their new fleets, not the old legacy programs."

About 90 percent of the company's work is for customers outside Canada, and providing on-site service is a key part of its approach.

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The CanWest global task force (GTF) travels virtually anywhere in the world to carry out repairs, often for practical reasons - it's not always financially feasible to ship an aircraft to Langley. But it's a measure that also vastly improves customer service.

"We can have someone on an airplane within 24 hours and on site, carrying out repairs and work," said Jackson. "We've done operations in the Middle East, Africa, U.S., U.K., Asia, South America and Central America - literally almost all over the globe in many different working environments, both commercial and military operations." CanWest's GTF also incorporates training into its deployments, passing on the decades of knowledge and experience that have

made it an industry leader. "We work with them so they can develop and learn these maintenance techniques - so they can better support their aircraft in-country," said Jackson. "That's kind of the heart of why the GTF

exists - it's also giving back to the industry."

Another recent endeavor was the creation of CanWest Global AirParts, a sister company that offers an extensive, competitively priced catalogue of top-quality new and re-certified components. AirParts offers wheels and brakes, landing gear, avionics and instruments, flight controls, electrical items and spares, all stored in-house to ensure fast turnaround times.

"I learned the parts business from a very iconic parts company," said Jackson, referring to his part-time job at Canadian Air Parts when he was in technical school in the mid-1990s. "I created the parts company [at CanWest] to be kind of a one-stop shop for our customers," he added. "And we were able to pass on the savings to our clients on the parts sales side because we have the MRO capability to do all the components and recertification and repairs in-house."

CanWest Aerospace continues to grow, albeit in cautious, strategic ways.

The company is in the process of creating a new 20,000-square-foot building that will be its new base, but the goal is to stay small enough to maintain the quality of work that produced its success, as well as strong relationships with customers.

"At the end of the day, we're here for the long run," said Jackson. "This isn't just a business for us. It's my life. It's my passion, and I want to be able to look back like my dad is - who's been in it for 40 years and say that I've been in it just as long. And you know what? It's been one of the best jobs I've ever had. I can't think of anything else I'd ever want to do."

> Ben Forrest | Ben is assistant editor of Vertical magazine. Before joining MHM Publishing in 2015, he spent the better part of 10 years in the newspaper industry, where he

worked as an editor, sports editor and general assignment reporter.





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For the last nine years, Vertical's December/January issue has been home to our annual photo contest, showcasing the very best in rotary-wing aviation photography from around the world. This year, with more photos being sent to us than ever before, we decided to reach out to five of our favorite photographers to ask them about their trade. We asked them to tell us about their careers, what makes a good aviation photo, and then pick some of their favorite helicopter-related shots. As you'll see over the next few pages, they've selected some phenomenal images, and the rarely told stories behind them are fascinating.



ANTHONY PECCHI

How did you get started in aviation photography?

When I was young, my grandfather helped me discover aviation and aviation photography. He shared his passion with me, and he taught me to do things with the utmost perfection. I've been a professional aviation photographer for eight years now. The most important aspect for me is to share my passion with a smile and professionalism.

What was your most memorable photo shoot?

I have three or four shoots that were particularly memorable, but the one that sticks out most was the "Airbus family flight" that included an H160, a Eurofighter, an A400M cargo plane, and a A350 airliner. It took about two years of organization with Yves Barillé (Airbus Helicopters' director of communications) and Hervé Jammayrac (chief test pilot at Airbus Helicopters). Photographing the shoot was very stressful, trying to get all the aircraft at the same speed, but it produced some incredible photos.

What makes a great aviation photograph?

For me the most important thing is to work with passion and professionalism and the results will speak for themselves. We are not pilots or engineers, we are photographers and we need to be equipped. We are very lucky to do what we do. When I organized the Airbus family flight with a jet fighter and a helicopter, the most important aspects were trust, respect, and passion!

What advice would you give to someone looking to develop a career in aviation photography?

It's a difficult industry to succeed in. I would like to have been born 30 years ago, when aviation was more attractive for those taking pictures.



ANTHONY PECCHI'S FAVORITE PHOTOS

This one-off photo shoot of the "Airbus family" took about two years of organization and coordination with the company's various branches. In this selection from photographer Anthony Pecchi, an Airbus Helicopters H160 leads a Eurofighter Typhoon and Airbus A400M cargo plane in a formation flight. "It was challenging to do this project, on the ground and in the air," said Pecchi. "But we did it, and it was an incredible view."

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An Airbus H175 is silhouetted by the setting sun. Pecchi said there was a brief five-minute window of incredible light to capture this photo.







DAN MEGNA

How did you get started in aviation photography?

For over 30 years I had pursued photography as a hobby, taking courses and shooting weddings and landscapes, etc., hoping one day to turn it into a money maker. But the results were not at all fulfilling. In my real job, I was a deputy sheriff with San Diego County Sheriff's Department, where I was assigned to the aviation unit.

About 20 years ago, a friend who was a working photographer suggested I merge my two pursuits: photography and helicopters. He reminded me how this setting provided amazing and unique opportunities for photography. The resulting images I shot instantly inspired me to focus on the world of helicopter aviation.

Can you tell us about the most challenging photo shoot you've attempted?

It was late afternoon on my last day in Trinidad to photograph a brand new Sikorsky S-76D for the manufacturer and a *Vertical* article — and of course, the weather was not cooperating. It was dark and dreary with gusty winds, lightning and rain squalls.

Standing in the open hangar watching the rain alongside the flight crews and company VIPs, I half-jokingly suggested, "If we could only get on top of the clouds, we'd probably have some amazing light." I was surprised when my suggestion was met with an optimistic, "Well, maybe we can just do that."

The plan called for the S-76D and my camera aircraft, an S-76C++, to obtain separate IFR clearances, climb up, and assess the conditions "on top." I was strapped into my harness sitting in the open rear cabin door as we departed the airport and ascended through dark clouds and rain. Emerging above the layer, I was awestruck by the incredible beauty of the light, the puffy clouds, and the perfectly still air! But where was the S-76D?

We had emerged several miles apart from one another, and now had to burn precious daylight

playing hide and seek among dozens of towering cumulus clouds. All the while, I was sure I was going to miss all the beautiful light! But once we located one another, we got to work and took advantage of the light we had left. When it was all over and I was confident I had captured some beautiful images, I understood how fortunate I was to have had this opportunity to work among such grandeur.

What makes a great aviation photograph?

For me, an especially strong aviation image contains at least two of three elements: faces, attitude and/or distinctive lighting. It's certainly not always possible or appropriate, but I like to try and include the faces of the pilot/crew to show emotion and perhaps give a viewer a bit of a personal connection. I also prefer to showcase aircraft in something other than a "wings level" attitude, which I find average and ordinary. And then there's the all-important (and typically the least controllable) element: lighting. I try to look for opportunities to incorporate unique or distinctive lighting to make an otherwise average image really extraordinary.

What advice would you give to someone looking to develop a career in aviation photography?

Technical knowledge and photography skills are important, but I believe one's personality, and the way one interacts with others — clients, flight crews and VIPs — is a far more vital element, and one that often determines one's success and longevity in this business.

Aviation is a niche industry, and everyone seems to know everybody. Everywhere you go, your reputation will have preceded you — they'll already know if you're a confident, knowledgeable professional, or just an arrogant, disingenuous poser. And that often translates into how you're treated and the opportunities you're afforded. So my advice: know your craft, be professional, and maintain your integrity.



DAN MEGNA'S AVORITE PHOTOS

An MD 900, operated by Papillon Helicopters for the National Park Service, maneuvers through a narrow section of the Grand Canyon just above the Colorado River.

This photo was taken for a project for *Vertical 911* showcasing the Grand Canyon National Park's Helitack crew and their MD 900. Megna spent several days flying with the crews, getting to understand their many public safety and utility missions throughout the park. But with noise abatement a major issue, he expected a request he made upon his arrival for an air-to-air photo session somewhere within the canyon itself would be denied. But he had to ask.

On his last day, his request was approved, and he had a green light to take two helicopters into the canyon and fly along the river. Papillon Helicopters provided a Bell 407 for the camera ship, and after a detailed safety brief and discussion of objectives, they launched for the canyon.

As pilot Bryce Barnett emerged with the MD 900 from the deep shadows of the canyon, sunlight suddenly illuminated the aircraft. "The spinning high-visibility blades were shining against the dark background, and I began shooting frames – all the while understanding I was capturing something pretty special," said Megna.

HPLEASES

An Erickson S-64E Aircrane configured with an external "rescue module" during evaluation by the Los Angeles Fire Department. Photographed from a Bell 412 with a handheld Nikon D2X and Nikkor 70-200 f/2.8 VR at 1/80 sec, December 2005.



A Sikorsky S-76D operated by National Helicopter Services skirts thunderstorms in late afternoon light above the Caribbean island of Trinidad. Photographed from a S-76C++ with a handheld Nikon D800 and Nikkor 70-200 f/2.8 VRII at 1/50 sec, June 2015.

NATIONAL HELICOPTER SPINO

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HEATH MOFFATT

How did you get started in aviation photography?

Attending photo school in Montreal at the start of my career, I began to photograph aircraft, and decided I wanted to specialize in that area. The fascination of flight caught me from a very young age. A huge inspiration comes from my father taking our family to the Smithsonian and seeing the flight exhibit and visiting Kitty Hawk in North Carolina. The history of aviation has always fascinated me.

Can you tell us about the most challenging photo shoot you've attempted?

I was photographing an air ambulance in a major Canadian city. A good percentage of emergency calls come at night, and I wanted to illustrate that fact with the helicopter and the city in the immediate background at dusk. I talked about my intentions and safety concerns with the chief pilot and was assured it could be done.

Without resorting to extreme ISO and needing to freeze the motion of the hovering helicopter, I needed to use flash lighting. I pre-sighted the shot with my camera and lens angle, and anticipated the hover height. I waited as dusk approached, and gave the signal to the pilot to start up and hover. Using hand signals we got a few different angles in the course of a few minutes and completed the shoot safely.

What was your most memorable photo shoot?

I was on assignment in the Netherlands to illustrate a company's base search-and-rescue [SAR] operations, the helicopter crew, and the region in which they operate. I wanted to capture the SAR tech's perspective when they're on the hoist, being lowered down onto a ship.

The shipping lanes were close at hand in the

English Channel, and over the radio we found a ship on which we could practice a rescue scenario safely. I was prepped with the hoist operator and was put on the hoist. Looking over my shoulder, I could see the ship I was being taken to. The propeller wake of the moving ship below, the helicopter above, the horizon over the ocean and being in mid-air all made for an exciting environment. Despite this, I had to keep in mind to shoot, and frame the shots to give the viewer a perspective of a SAR tech in a rescue scenario. It's a shoot I'll never forget.

What makes a great aviation photograph?

The key is to keep asking yourself why you like the image. Is it the lighting, the angle, the environment, or a combination of all the above? Before beginning an aviation photo shoot, you should discuss with the pilots how you can safely achieve the angles you hope to shoot to create a dynamic-looking image, in which all the aforementioned ingredients come together. Beyond that, good lighting is key in any photograph. I'm always quick to acknowledge the importance of pilots and crew to a successful photograph.

What advice would you give to someone looking to develop a career in aviation photography?

Study and diversify. Look at others in the field and see what they're doing, the techniques they are using, and don't get caught up in the "gear" and brand. Networking helps to further your name and establish your brand.

There are very few photographers in the world who photograph aviation 100 percent of the time. Having a backup plan to support your income in times when you can't be photographing planes and helicopters will ensure you're well rounded.



HEATH MOFFATT'S FAVORITE PHOTOS

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Coast Garde

A Canadian Coast Guard Bell 429 flies over an island off the coast of British Columbia.

This photo was taken in the fall – a time of year that's not known to provide many days of blue sky on the West Coast. With overcast weather to the day originally proposed for the shoot, photographer Heath Moffatt persuaded the Coast Guard's senior management to delay it by one day. "The forecast is not always a guarantee, but we took a gamble and we got of weather," he said. "I discussed with the plots what I hoped to achieve with the nearby natural beauty of the helicopter's operating environment. We were in a fairly moderate bank when we over flew a popular landmark with its distinctive lighthouse markings, and the skill of the pilots forming up and the communication from the lead helicopter combined with the late day light made for one of my most memorable images."

A Royal Canadian Air Force Sikorsky CH-124 Sea King, belonging to 443 Maritime Helicopter Squadron, conducts ship-based training onboard HMCS Vancouver in the Strait of Georgia in January 2016. The pilots were Maj. Troy Maa and Capt. Chelsey Llewellyn.



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A Royal Canadian Air Force Leonardo CH-149 Cormorant, belonging to 442 Transport and Rescue Squadron; 19 Wing Comox, conducts a low light training exercise near the town of Comox on Vancouver Island.





LLOYD HORGAN

How did you get started in aviation photography?

Back in 2009, I was reluctantly dragged along by a friend to watch planes fly at low level in Wales, at a location that is fairly famous among photographers now. Commonly known as the "mach loop," it's within area seven of the low flying network, and due to the flowed nature of the loop it provides the ideal viewpoint to watch fixed- and rotary-wing aircraft operate at low level. That experience peaked my interest in aviation photography, but what really got it going and proved to be a turning point was winning the action category in the 2012 *Vertical* Magazine Photo Contest.

Can you tell us about the most challenging photo shoot you've attempted?

It was probably my first shoot, which was in 2013 with the now defunct 771 Naval Air Squadron of the Royal Navy. I had been invited down to RNAS Culdrose by their public relations officer to document 24 hours in the life of an on-duty crew. It was my first real exposure to flying in a helicopter, working with crews, and being able to put a brief together. It was a completely alien environment and experience, but I seemed to impress the crews with how I worked, which made things a lot easier when trying to brief shots. Looking at the shots now, it's clear that they aren't anything special, but I learned so much from that one trip that it proved to be an invaluable opportunity.

What was your most memorable photo shoot?

In July this year I was very fortunate to go on a joint sortie with the RCAF's 450 Tactical Helicopter

Squadron and the RAF's 18(B) Squadron, with a Chinook from each squadron. The plan was to fly over to Vimy, France, for a photo setup at the Canadian National Vimy Memorial. From there, we would fly to Pegasus Bridge and along the Normandy coast to Pointe du Hoc. Sitting on the ramp of the RAF Chinook while I was shooting the Canadian Chinook in front of the memorial, it struck me how unique and emotive these photos would be. Landing back at Odiham, it was clear to see how much it meant to the Canadian crew — a "once-in-a-lifetime opportunity" as one of them said.

What makes a great aviation photograph?

I think it's fairly subjective, but I personally like the human element of aviation — something that is often overlooked, but it's a brilliant way of telling a story through imagery. It's much easier for someone to relate to a person than it is a helicopter, the key is subtly placing the helicopter or reference to it in the frame to give context. It takes something special to really stand out nowadays, and sometimes thinking outside of the box is the best way to do it.

What advice would you give to someone looking to develop a career in aviation photography?

Find a niche, don't be afraid to ask for advice and help, understand at least the basics of rotary- and fixed-wing flying, and never demand a specific photo when working with an operator/ squadron/unit if they've said it's probably not possible. The easier you can slot in with a crew, the more likely they are to help you.



LLOYD HORGAN'S FAVORITE PHOTOS

Two Portuguese air force Leonardo AW101 Merlins from 751 Squadron/Esquadra 751 at Ovar air base during the multinational Hot Blade 14 exercise.

Photographer Lloyd Horgan had tried the shot the night before, but said he couldn't get the lighting right, leading to an unbalanced look. "The benefit of working on an exercise is that they usually fly two or three sorties a day, with one being at night, so I knew I would get another chance," he said. "After chatting with their public relations officer, we angled one of the lights to the right of the aircraft to light up the blades, and made sure that the crew kept the rotors turning with the landing light off and the green NVG-friendly lights on."

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Wether Car

Smoke is kicked up from the rotorwash of a U.S. air force Sikorsky HH-60G Pave Hawk as the crew flares for a landing on the Stanford training area in the U.K.



Here, a Finnish rescue swimmer from the Finnish border guard stands in front of an Airbus H215 from the Air Patrol Squadron. "Trying to capture the human element when working with helicopters is such an integral part to my work," said Horgan. "It's also a great tool for establishing relationships with crews."



A rescue swimmer from the Swedish Maritime Administration is hoisted down from one of its AW139s over the Baltic Sea.





SKIP ROBINSON

How did you get started in aviation photography?

I've been taking pictures of helicopters on film since the 1980s with a goal of documenting helicopter history for future historians, writers, and enthusiasts. I saw Mike Reyno's helicopter photography in the 1990s and was blown away —and wanted to do it, too. I met Mike and he gave me good advice, and once I started shooting digital in 2005, I really pushed forward. I started sending Mike pics and he started publishing my work. I also met and worked with Dan Megna, one of the best photographers out there, and he gave me great advice and pointers. I've always been a helicopter nut, so doing this is a dream for me.

Can you tell us about the most challenging photoshoot you've attempted?

Every photo shoot is a challenge, but multi-ship, over-water, and high-altitude mountain shoots have their particular challenges. I've done this long enough to understand a particular helicopter's performance level and how to talk to pilots on what I want to accomplish within the aircraft's ability. Shooting around a fixed ground object (a downtown cityscape, bridges, stadiums) tests your mind on what angles, altitude, and lighting to use, and what is safe.

What was your most memorable photo shoot?

Because I never thought I'd have the opportunity to be around them, shooting Russian Mi-24D Hinds. I could not believe my eyes watching what was at one time the direct enemy of U.S. Army aviation. I will always consider it one of my great opportunities. The fact that Elan Head, my editor, mentor, and friend was in the front seat of one of the MI-24s was awesome. She couldn't get the smile off her face once our photo flight landed. After that, flying with MV-22B and CH-53E squadrons were definite highlights. But every shoot I do has things I remember, and I know I'm very fortunate to do what I do with machines I love so much.

What makes a great aviation photograph?

Background primarily, lighting always, and shooting a particular helicopter in its operational environment — such as police operations, heavylift construction, firefighting, hoist rescue, or dropping VIPs off on a skyscraper. Helicopters work for a living, so the best images come from photographing them in their working environment.

What advice would you give to someone looking to develop a career in aviation photography?

You're going to have years of work ahead of you to gain experience. While it can be a lot of fun, it's not easy, and the most important aspect is safety. You need to know where the photographed aircraft is now, where it's going to be in three to six seconds for the critical shot, and then make sure you're maintaining lateral distances (I put helicopters below me rather than parallel, so if a bird strike or other problems develop they can go left or right without worry). A complete briefing in advance of flying is critical.

I always sit behind my pilot — rather than beside or on the opposite side in the rear — so that I'm not blocking his view in any way and we can both see what's going on.

The Aérospatiale Allouette II or Lama are near perfect as a photo ship. Take the door off and you can shoot unobstructed from any angle. They are also very smooth with little airframe vibration, giving you the ability to get better shots.



SKIP ROBINSON'S FAVORITE PHOTOS

This Sikorsky S-92 shoot was memorable for photographer Skip Robinson for several reasons. "First, I did this for Sikorsky, which was a dream of mine," he said. "Second, the lighting was superb, so we set this up to get the Sikorsky emblem in the same shot as the S-92 — and it really came out well."





This image of a Helinet Sikorsky UH-60A "Moviehawk" and Airbus AS350 B2 was completed in the early evening after a full day of shooting. "On our way back to the airport, I saw the sunset, and waited for the two aircraft to set themselves up," said Robinson.



This shot looking down on an Aris Helicopters Sikorsky S-58T was taken from the top of the Nikon Building in the Mid-Wilshire district in Los Angeles, California."I hung over the side, stabilized the camera, and shot at 1/20th shutter speed to get the disc of the rotor," said Robinson.





At *Vertical,* we always look forward to putting together our final issue of the year. It is, without doubt, the one that is most fun to create — and the one that, more often than not, causes the most heated debate in the office. The reason being that for the last nine years it has played host to our annual photo contest, in which we have the unenviable task of combing through hundreds of spectacular photos of helicopters doing all kinds of things in locations as broad as the imagination — and picking the best of the bunch.

It's not an easy job. Last year, we broke our own record with over 750 entries. This year, we had over 1,400. And the quality, as you'll see over the following pages, was simply outstanding. We pride ourselves on producing a magazine that's as visually appealing as it is informative and are lucky to see jaw-dropping photography on a regular basis, but some of your photos even caused us to shake our heads in disbelief. We'd wager it'd be hard to flick through the next few pages without exhaling in awe at least once.

This year's Grand Prize winner is Maur "Muzza" Mere, a freelance landscape and adventure photographer. Congratulations to Maur, and all the winners across the three competition categories.

The contest was was open to any photographer over the age of 18 – amateur or professional – and was free to enter. We accepted entries through our website from Aug. 18, 2017, to Oct. 27, 2017, and each entry was then submitted without the photographer's details into a digital folder. Vertical's editors then whittled the more than 1,400 entries to just 20 finalists in each of the three categories (Beauty Shots, Helicopters at Work, and Military).

We then handed it over to our sponsors: Bell Helicopter, Airbus Helicopters, Bambi Bucket, Eagle Copters, 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. Mere's photo secured the most votes, and has won the Grand Prize of \$1,000 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 \$500, \$250, and \$100, respectively.

Thanks to everyone who sent their work to us, and to all our photo contest sponsors for their support and helping to make this contest such an outstanding success.







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MAUR MERE // Maur "Muzza" Mere, 36, is originally from Estonia, but has called Golden, British Columbia, home for the last three years. He's a freelance landscape nome for the last three years. He's a freedance landscape and adventure photographer, and you'll usually find him with his camera in the mountains. During winter months, he takes photos at Great Canadian Heli-Skiing. He said that what he loves most about helicopters is that even after hundreds of landings and takeoffs, the magic doesn't wear off — it grows!

Reflecting off the surface of a pond as the sun peeks out from behind a mountain, an Airbus AS350 AStar takes off behind the picturesque Heather Mountain Lodge near Rogers Pass in the interior of British Columbia. The aircraft was one of many helicopters used to fight fires during the most destructive wildfire season the province has seen since 1958.

FIRST HELICOPTERS AT WORK PLACE





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BRYAN DUDAS // Bryan Dudas, 32, has worked for Erickson Inc. since 2007, providing field maintenance for the S-64 Aircrane. His work has taken him across Northern Canada, Europe, and Australia. In addition to helicopter maintenance, Dudas has an interest in photography and film work. On Sept. 29, this Erickson S-64F Aircrane placed the final bridge to complete the 35-mile (56-kilometer) 138-kV transmission line to support the Brucejack Gold Project led by Rokstad Power. Structure 6013, weighing a total of 282,200 pounds (128,457 kilograms) is one of the highest transmission towers in Canada, standing at 145 feet (44 meters) and an altitude of around 6,000 feet (1,830 meters) above sea level. It took a combined total of 23 picks with the Aircrane and four picks with a Bell 214B-1 to build it.



ERICKSON AIR-CRANE

10



MICHAEL GILBERT // Mike Gilbert works in Los Angeles, California, as a television director for KABC-TV. When he's not working, you'll find him outside taking landscape, automotive, and aviation photographs.

A Los Angeles Fire Department Leonardo AW139 makes a night drop on the La Tuna Fire near Sunland, which burned more than 7,000 acres in early September.



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HELICOPTERS AT WORK

- PLACE -



Firefighters helps medical crewmembers from Miami Valley Hospital's CareFlight program perform a hot onload of a patient onto an Airbus AS365 N2.



WILLIAM MURDOCK // William Murdock, 40, has worked as a critical care paramedic for three years with CareFlight Air & Mobile in Dayton, Ohio. He has been a paramedic for 12 years, and a photographer for over 25 years. He learned photography through the U.S. Marine Corps as a combat photographer, and then obtained a bachelors in photography from Columbus College of Art and Design.



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BEAUTY SHOTS IN THE FIELD



BENJAMIN SCHAEFER // Benjamin Schaefer is a U.S. Army veteran who holds a wide range of rotary- and fixed-wing pilot ratings. He is currently employed as a rotorcraft certified flight instructor at Southern Utah University's aviation program. He picked up photography as a hobby and continues to enjoy taking photos of anything related to aviation in his spare time.

A Bell 206 spends the night alongside a campsite and underneath a sky full of stars in Canyonlands National Park near Moab, Utah.





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An Airbus H120 Calibri, operated by Swiss Helicopter, is captured in silhouette just before passing in front of a supersized sun. The aircraft was above Gruyères, Switzerland, providing aerial photography during the Gordon Bennet Cup — a longstanding gas balloon race.



SVEN ZIMMERMANN // Sven "Grimmi" Zimmermann, 41, is a Swiss freelance journalist for different aviation magazines, and he specializes in military aviation. Photography has been a great hobby for him for nearly 25 years, and he has lately returned to local animal photography in his beloved Switzerland.

SECOND — BEAUTY SHOTS IN THE FIELD

— PLACE —



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Tropic Air's Airbus AS350 B3s are parked on the edge of a giant sand dune in one of the most remote areas of Northern Kenya. This is just one of the many incredible stops en route to Africa's largest desert lake -



SEAN DUNDAS // Sean Dundas, 37, is a photographic safari guide living in Kenya. He enjoys flying his Piper PA-18 Super Cub and leading helicopter expeditions to remote parts of Africa.
THIRD

BEAUTY SHOTS IN THE FIELD

PLACE

MILITARY SHOTS





BRIAN EDWARDS // Brian Edwards works with his partner — K-9 Piper — as an airport operations supervisor at the Cherry Capital Airport in Traverse City, Michigan. Long-time lovers of aviation, they spend most of their days on the airfield chasing away wildlife and photographing aircraft. "I get to work with my best friend and be around aviation all day," said Edwards. "It doesn't get much better than that."

K-9 Piper and USCG Air Station Traverse City's 6543 pose together one final time before the Air Station transitioned to the Sikorsky MH-60T.



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OGNYAN STEFANOV // Ognyan Stefanov, 37, graduated with a BA in photography, and was a long-standing photographer of the Bulgarian air force. He now works as the official cameraman of the Bulgarian president and practices his favorite pastime of aviation photography as a freelancer. Stefanov's work has been shown in a number of exhibitions, albums, calendars, and many magazines.



BART ROSSELLE // Bart Rosselle works as a military photographer for the Belgian air force headquarters, where he specializes in air-to-air photography. He considers himself extremely stunning pictures of the aircraft in Belgium and abroad.

A Belgian air force NHIndustries NH90 takes part in exercise Tropical Storm in Gabon. The aircraft, from 18 Squadron "Ares," was flying in support of the Belgian commando, special, and path finder forces, conducting airmobile operations,



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MENTIONS

The crew of an Airlift AS Leonardo AW169 suits up for a marine pilot transfer flight. **Tom Andreas Østrem Photo**



A Czech air force Mi-35 with "Alien Tiger" livery lets off some smoke during CIAF 2017. Ian Hitchcock Photo

A loadmaster holds the sling as an Aérospatiale SA315 B Lama comes in to land. **Philipp Schwegler Photo**

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Making a colorful splash: A Chinook operated by Columbia Helicopters drops retardant during firefighting operations. **Kari Greer Photo**



Two people hang on the end of a longline as a helicopter completes a rescue on Mount Temple near Banff, Alberta. **Ladon F. Roeder Photo**

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A Stars air ambulance Airbus BK-117 gets ready for a takeoff at night. Wilfried Wagner Photo



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Dark skies loom over Aberdeen, Scotland, as this S-92 heads out to complete a passenger transfer to oil platforms in the North Sea. Paul Harvey Photo

:41



When doing lift work at a location where it is unsuitable to land, the long line must be attached while the aircraft is airborne. In this case, on the top of a skyscraper as dawn breaks. **Timothy Dantuma Photo**

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An Airbus AS350 on heliskiing operations in the Chilean Andes. Eduardo Boisset Photo







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MENTIONS

Three AS350 FX2s are parked under a cloudy night's sky in western New South Wales, Australia. **James Williams Photo**

With the moon looming large behind it, an Australian Army MRH90 comes into land at Townsville airport in Australia. **Ian Hitchcock Photo**

Independent Helicopters owner/ chief pilot Heather Howley lines up for a perfect aerial shot of some Monday night football featuring the Philadelphia Eagles. David Alan Arnold Photo













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This photo was taken on July 8, 2017, on top of Dallas Parkland Hospital with the skyline of the city in the background. Many buildings were illuminated in blue to commemorate the five police officers who were killed in a targeted attack in the city a year earlier. **Drew Nadig Photo**



BONUS HONORABLE MENTIONS

A Dutch air force Chinook practices a brownout landing as the sun sets. **Joris Van Boven Photo**

Returning to base over Durban, South Africa, after a successful training flight. **Kirsten Augustyn Photo**

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CareFlight Air & Mobile's CareFlight 1 — an AS365 N+ Dauphine — is reflected in blue sunglasses. William Murdock Photo





A chilly start! Fresh snowfall has buried this aircraft early in the morn-ing in Little Cottonwood Canyon, Utah. **Connor Worth Photo**





Taking a selfie at the end of a long line during pre-season short haul training. **Ryan Cutter Photo**





One of the Atlantic Undersea Test and Evaluation Center's Sikorsky S-61Ns heads out for another mission. Ronald Edward Ward Photo

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MENTIONS

Ball in a

This Panorama Helicopters AS350 B2 was one of two AStars working on an icebreaker travelling through the Northwest Passage. Here, it dropped in for a closer look at an iceberg. **Stephane Caron Photo**

Summer Street



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A Swiss air force AS532 UL Cougar performs a flight demonstration over Axalp, Switzerland. **Peter Schneider Photo**



YL-HMO

An Agusta-Bell 206B belonging to the Latvian border guard's "Sigma" aviation squadron special force unit flies alongside the country's border with Russia. **Uldis Pelna Photo**



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THERE I WAS ... | DON PORTER TECH REP MISADVENTURES

Drafted into the U.S. Army at the age of 20 in August 1965, I was pulled into the vortex of a major troop buildup for the Vietnam War. The Army was interested in my Federal Aviation Administration (FAA) mechanic and fixed-wing pilot certificates, but passing up military flight school, I wanted to give Uncle Sam two years and then move on. Following eight weeks of basic training, I wasn't shuttled into cooking or artillery training like many guys. I went to the Army's tech school in Virginia, but not to attend classes — I was to teach aircraft electrical theory to maintenance officers. Still a lowly E-2 private, I figured those FAA tickets kept me out of the infantry.

My second year in the service found me in Vietnam with the 2nd Brigade, 1st Cavalry Division (Airmobile), pitching pup tents at a half-dozen inhospitable landing zones (LZs). One of the pilots suggested I might later join Bell Helicopter Co. as a technical representative. It didn't happen. But in September 1968, I saw an ad for "overseas" tech reps placed by the aircraft division of Hughes Tool Co., maker of the OH-6A light observation helicopter. The Army had contracted for more than 1,100 of the machines for service in Vietnam. I was interested.

A brief interview landed me on the payroll, followed by months of training. Most reps were older ex-military guys who seemed bored with retirement. Others were civilian mechanics seeking adventure and an overseas bonus. We would be domiciled at a dozen or more Army base camps spread across Vietnam. At 24, the youngest rep there, I'd have field grade status as a civilian, equivalent to a major.

In January 1969, I was assigned to Camp Enari, home of the 7/17 Air Cavalry, not far from Pleiku in central Vietnam. After enjoying the hospitality aboard a Braniff International 707 from California to Saigon, I checked in with my new boss. The next day, I boarded an Air Force C-130 that had just finished a livestock transport. The stench was horrendous. The plane lacked troop seats, so I sat on the damp metal floor, gripped webbing to restrain myself, and held my nose. We touched down at Pleiku Air Base at sundown. I called for a ride to Enari and was told that vehicles weren't allowed in or out of the compound after dusk. I'd have to wait until morning. There I was, stuck in a dark, musty civilian substitute for an "air terminal" with nobody in sight, stale water, no food, and plenty of mosquitos eager to attack.

I settled into the job and, seven days a week for nine months, I checked tolerances, balanced tail rotors, wrote reports and assisted pilots, crew chiefs and mechanics whenever called upon. The OH-6A, nicknamed the "Loach" by the troops, was a simple design and incredibly safe in a crash. The work contrasted with my earlier enlisted days, running up OH-13 engines and leading a crew maintaining a dozen UH-1Ds.

In forward areas, tech reps from helicopter manufacturers were heralded as unsung heroes - critical links between the troops in the field and engineers stateside, and handling issues well above a rep's pay grade. However, I also discovered the darker side of the job. The hostile environment didn't agree with one Hughes employee. During his first night in-country, the enemy lobbed a mortar round his way. Although he was uninjured, the shock was enough for him to board a plane back to California. Another Hughes rep was killed when the Huev he was flving in as a passenger had its main transmission seize at altitude. I also heard of another man who was flving in an OH-6A over the South China Sea. when the warrant officer at the controls misjudged his altitude and hit the water hard, submerging both himself and the rep. Thankfully, they survived.

A few months before departing Vietnam, a couple of things rattled my nerves. I was on a maintenance test flight when a transmission chip light came on, necessitating an autorotation in the middle of hostile territory. I sweated every minute as we waited to be rescued. Weeks later, Viet Cong gunners dropped a few rockets into Enari around midnight. One round blew a crater in the road and the blast from the impact bwlew the door off my hooch (a small hut). I was thankful to be huddled in a well-fortified bunker. A hundred feet away, a Cobra gunship and a Loach were blown to pieces.

Little things annoyed me. Dripping in sweat after a day on the flight line, I plopped my tired body onto my air mattress. Unseen on a shelf above me was a rat that decided to leap onto my bare chest. I instinctively bolted out the door. And then there was the careless officer on the other side of my hooch's wall who accidentally fired an M-16. The round came through the wall and whizzed over my head.

After my days in the Army at remote LZs near the Cambodian border, followed by civilian work as a tech rep, it felt like I'd used up my nine lives. I waved goodbye to Vietnam from the window of a Pan Am 707 and didn't return. I remained with Hughes in product support, and became part of the team that developed and fielded the AH-64 Apache gunship.





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